NAVFAC
Naval Facilities Engineering Command

Off-Base Drinking Water Sample Results, Combined Level 2 and Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, and the Sample Location Figure, SDG 320-33018-1

Naval Air Warfare Center Warminster
Warminster, Pennsylvania

August 2019

N62269_001132
WARMINSTER_NAWC
SSIC 5000-33c

LABORATORY DATA PACKAGE, 320-33018-1, NAS WILLOW GROVE NAWC WARMINSTER PA

11/20/2017

TESTAMERICA LABORATORIES INC

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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 320-33018-1

Job Description: Warminster: PFAS, NAS JRB Willow Grove

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

Attention: Andy Frebowitz

Approved for release.
David R Alltucker
Project Manager I
11/20/2017 1:54 PM

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11/20/2017

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Qualifiers

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.

Glossary

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

Job Narrative
320-33018-1

Receipt
The samples were received on 11/3/2017 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.4º C and 3.2º C.

Receipt Exceptions
The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): NAWC-110217-FRB-177-IRR (320-33018-6). The container labels list NAWC-110217-FRB-IRR, while the COC listS NAWC-110217-FRB-177-IRR.

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

Method(s) 537: Surrogate recovery for the following samples was outside control limits: NAWC-110217-RW-177-IRR (320-33018-5) and NAWC-110217-RW-177-SHOP (320-33018-7). Re-analysis was performed with concurring results. The original analysis has been reported.

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

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

Detection Summary

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

TestAmerica Job ID: 320-33018-1

Client Sample ID: NAWC-110217-RW-286 — Lab Sample ID: 320-33018-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	21	J M	41	7.0	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	16	J	21	2.9	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.5	J	31	5.7	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.9	J	10	2.0	ng/L	1		537	Total/NA

Client Sample ID: NAWC-110217-FRB-286 — Lab Sample ID: 320-33018-2

No Detections.

Client Sample ID: WGNA-110217-RW-3978 — Lab Sample ID: 320-33018-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	22	J M	41	6.9	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	14	J	20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	8.3	J	31	5.6	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.5	J	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: WGNA-110217-FRB-3978 — Lab Sample ID: 320-33018-4

No Detections.

Client Sample ID: NAWC-110217-RW-177-IRR — Lab Sample ID: 320-33018-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	41	M	41	7.0	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	16	J	21	2.9	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	29	J	31	5.7	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.0	J M	10	2.0	ng/L	1		537	Total/NA

Client Sample ID: NAWC-110217-FRB-177-IRR — Lab Sample ID: 320-33018-6

No Detections.

Client Sample ID: NAWC-110217-RW-177-SHOP — Lab Sample ID: 320-33018-7

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	21	J	41	7.0	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	12	J	21	2.9	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	14	J	31	5.6	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.1	J	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-110217-FRB-177-SHOP — Lab Sample ID: 320-33018-8

No Detections.

Client Sample ID: NAWC-110217-RW-185 — Lab Sample ID: 320-33018-9

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	19	J	40	6.8	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	14	J	20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	10	J	30	5.5	ng/L	1		537	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: NAWC-110217-RW-185 (Continued) Lab Sample ID: 320-33018-9

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	9.8	J	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-110217-FRB-185 Lab Sample ID: 320-33018-10

No Detections.

Client Sample ID: NAWC-110217-RW-355 Lab Sample ID: 320-33018-11

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	9.2	J	40	6.8	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	7.8	J	20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.1	J	30	5.5	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.3	J M	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-110217-FRB-355 Lab Sample ID: 320-33018-12

No Detections.

Client Sample ID: NAWC-110217-RW-348 Lab Sample ID: 320-33018-13

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	33	J	40	6.8	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	19	J	20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	10	J	30	5.5	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.7	J	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-110217-FRB-348 Lab Sample ID: 320-33018-14

No Detections.

Client Sample ID: WGNA-110217-RW-3882 Lab Sample ID: 320-33018-15

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	9.0	J	40	6.8	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	7.1	J	20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	8.2	J	30	5.5	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.7	J	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: WGNA-110217-FRB-3882 Lab Sample ID: 320-33018-16

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: NAWC-110217-RW-286 — Lab Sample ID: 320-33018-1

Date Collected: 11/02/17 08:10 **Matrix: Water**
Date Received: 11/03/17 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**21**	**J M**	41	7.0	ng/L		11/08/17 11:47	11/13/17 03:05	1
Perfluorooctanoic acid (PFOA)	**16**	**J**	21	2.9	ng/L		11/08/17 11:47	11/13/17 03:05	1
Perfluorononanoic acid (PFNA)	21	U M	25	8.3	ng/L		11/08/17 11:47	11/13/17 03:05	1
Perfluorohexanesulfonic acid (PFHxS)	**6.5**	**J**	31	5.7	ng/L		11/08/17 11:47	11/13/17 03:05	1
Perfluoroheptanoic acid (PFHpA)	**3.9**	**J**	10	2.0	ng/L		11/08/17 11:47	11/13/17 03:05	1
Perfluorobutanesulfonic acid (PFBS)	37	U	93	17	ng/L		11/08/17 11:47	11/13/17 03:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*84*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:05*	*1*
13C2 PFDA	*79*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:05*	*1*

Client Sample ID: NAWC-110217-FRB-286 — Lab Sample ID: 320-33018-2

Date Collected: 11/02/17 08:05 **Matrix: Water**
Date Received: 11/03/17 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	41	7.0	ng/L		11/08/17 11:47	11/13/17 03:09	1
Perfluorooctanoic acid (PFOA)	8.2	U	21	2.9	ng/L		11/08/17 11:47	11/13/17 03:09	1
Perfluorononanoic acid (PFNA)	21	U	25	8.2	ng/L		11/08/17 11:47	11/13/17 03:09	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	31	5.6	ng/L		11/08/17 11:47	11/13/17 03:09	1
Perfluoroheptanoic acid (PFHpA)	4.1	U	10	1.9	ng/L		11/08/17 11:47	11/13/17 03:09	1
Perfluorobutanesulfonic acid (PFBS)	37	U	92	17	ng/L		11/08/17 11:47	11/13/17 03:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*84*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:09*	*1*
13C2 PFDA	*85*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:09*	*1*

Client Sample ID: WGNA-110217-RW-3978 — Lab Sample ID: 320-33018-3

Date Collected: 11/02/17 08:40 **Matrix: Water**
Date Received: 11/03/17 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**22**	**J M**	41	6.9	ng/L		11/08/17 11:47	11/13/17 03:14	1
Perfluorooctanoic acid (PFOA)	**14**	**J**	20	2.8	ng/L		11/08/17 11:47	11/13/17 03:14	1
Perfluorononanoic acid (PFNA)	20	U M	24	8.1	ng/L		11/08/17 11:47	11/13/17 03:14	1
Perfluorohexanesulfonic acid (PFHxS)	**8.3**	**J**	31	5.6	ng/L		11/08/17 11:47	11/13/17 03:14	1
Perfluoroheptanoic acid (PFHpA)	**6.5**	**J**	10	1.9	ng/L		11/08/17 11:47	11/13/17 03:14	1
Perfluorobutanesulfonic acid (PFBS)	37	U	92	16	ng/L		11/08/17 11:47	11/13/17 03:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*78*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:14*	*1*
13C2 PFDA	*85*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:14*	*1*

Client Sample ID: WGNA-110217-FRB-3978 — Lab Sample ID: 320-33018-4

Date Collected: 11/02/17 08:35 — **Matrix: Water**
Date Received: 11/03/17 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.9	ng/L		11/08/17 11:47	11/13/17 03:19	1
Perfluorooctanoic acid (PFOA)	8.1	U	20	2.8	ng/L		11/08/17 11:47	11/13/17 03:19	1
Perfluorononanoic acid (PFNA)	20	U	24	8.1	ng/L		11/08/17 11:47	11/13/17 03:19	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.6	ng/L		11/08/17 11:47	11/13/17 03:19	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		11/08/17 11:47	11/13/17 03:19	1
Perfluorobutanesulfonic acid (PFBS)	36	U	91	16	ng/L		11/08/17 11:47	11/13/17 03:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*82*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:19*	*1*
13C2 PFDA	*88*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:19*	*1*

Client Sample ID: NAWC-110217-RW-177-IRR — Lab Sample ID: 320-33018-5

Date Collected: 11/02/17 09:10 — **Matrix: Water**
Date Received: 11/03/17 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**41**	**M**	41	7.0	ng/L		11/08/17 11:47	11/13/17 03:24	1
Perfluorooctanoic acid (PFOA)	**16**	**J**	21	2.9	ng/L		11/08/17 11:47	11/13/17 03:24	1
Perfluorononanoic acid (PFNA)	21	U M	25	8.2	ng/L		11/08/17 11:47	11/13/17 03:24	1
Perfluorohexanesulfonic acid (PFHxS)	**29**	**J**	31	5.7	ng/L		11/08/17 11:47	11/13/17 03:24	1
Perfluoroheptanoic acid (PFHpA)	**6.0**	**J M**	10	2.0	ng/L		11/08/17 11:47	11/13/17 03:24	1
Perfluorobutanesulfonic acid (PFBS)	37	U	93	17	ng/L		11/08/17 11:47	11/13/17 03:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*60*	*Q*	*70 - 130*	*11/08/17 11:47*	*11/13/17 03:24*	*1*
13C2 PFDA	*88*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:24*	*1*

Client Sample ID: NAWC-110217-FRB-177-IRR — Lab Sample ID: 320-33018-6

Date Collected: 11/02/17 09:05 — **Matrix: Water**
Date Received: 11/03/17 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	41	6.9	ng/L		11/08/17 11:47	11/13/17 03:28	1
Perfluorooctanoic acid (PFOA)	8.1	U	20	2.8	ng/L		11/08/17 11:47	11/13/17 03:28	1
Perfluorononanoic acid (PFNA)	20	U	24	8.1	ng/L		11/08/17 11:47	11/13/17 03:28	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.6	ng/L		11/08/17 11:47	11/13/17 03:28	1
Perfluoroheptanoic acid (PFHpA)	4.1	U	10	1.9	ng/L		11/08/17 11:47	11/13/17 03:28	1
Perfluorobutanesulfonic acid (PFBS)	37	U	91	16	ng/L		11/08/17 11:47	11/13/17 03:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*87*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:28*	*1*
13C2 PFDA	*89*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:28*	*1*

Client Sample ID: NAWC-110217-RW-177-SHOP — Lab Sample ID: 320-33018-7

Date Collected: 11/02/17 09:20 — **Matrix: Water**
Date Received: 11/03/17 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**21**	**J**	41	7.0	ng/L		11/08/17 11:47	11/13/17 03:33	1
Perfluorooctanoic acid (PFOA)	**12**	**J**	21	2.9	ng/L		11/08/17 11:47	11/13/17 03:33	1
Perfluorononanoic acid (PFNA)	21	U M	25	8.2	ng/L		11/08/17 11:47	11/13/17 03:33	1
Perfluorohexanesulfonic acid (PFHxS)	**14**	**J**	31	5.6	ng/L		11/08/17 11:47	11/13/17 03:33	1
Perfluoroheptanoic acid (PFHpA)	**4.1**	**J**	10	1.9	ng/L		11/08/17 11:47	11/13/17 03:33	1
Perfluorobutanesulfonic acid (PFBS)	37	U	92	17	ng/L		11/08/17 11:47	11/13/17 03:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*48*	*Q*	*70 - 130*	*11/08/17 11:47*	*11/13/17 03:33*	*1*
13C2 PFDA	*84*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:33*	*1*

Client Sample ID: NAWC-110217-FRB-177-SHOP — Lab Sample ID: 320-33018-8

Date Collected: 11/02/17 09:15 — **Matrix: Water**
Date Received: 11/03/17 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		11/08/17 11:47	11/13/17 03:47	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		11/08/17 11:47	11/13/17 03:47	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		11/08/17 11:47	11/13/17 03:47	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		11/08/17 11:47	11/13/17 03:47	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		11/08/17 11:47	11/13/17 03:47	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		11/08/17 11:47	11/13/17 03:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*84*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:47*	*1*
13C2 PFDA	*87*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:47*	*1*

Client Sample ID: NAWC-110217-RW-185 — Lab Sample ID: 320-33018-9

Date Collected: 11/02/17 10:10 — **Matrix: Water**
Date Received: 11/03/17 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**19**	**J**	40	6.8	ng/L		11/08/17 11:47	11/13/17 03:52	1
Perfluorooctanoic acid (PFOA)	**14**	**J**	20	2.8	ng/L		11/08/17 11:47	11/13/17 03:52	1
Perfluorononanoic acid (PFNA)	20	U M	24	8.0	ng/L		11/08/17 11:47	11/13/17 03:52	1
Perfluorohexanesulfonic acid (PFHxS)	**10**	**J**	30	5.5	ng/L		11/08/17 11:47	11/13/17 03:52	1
Perfluoroheptanoic acid (PFHpA)	**9.8**	**J**	10	1.9	ng/L		11/08/17 11:47	11/13/17 03:52	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		11/08/17 11:47	11/13/17 03:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*77*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:52*	*1*
13C2 PFDA	*82*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:52*	*1*

Client Sample ID: NAWC-110217-FRB-185 — Lab Sample ID: 320-33018-10

Date Collected: 11/02/17 10:05 **Matrix: Water**
Date Received: 11/03/17 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		11/08/17 11:47	11/13/17 03:56	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		11/08/17 11:47	11/13/17 03:56	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		11/08/17 11:47	11/13/17 03:56	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		11/08/17 11:47	11/13/17 03:56	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		11/08/17 11:47	11/13/17 03:56	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		11/08/17 11:47	11/13/17 03:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*87*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:56*	*1*
13C2 PFDA	*88*		*70 - 130*	*11/08/17 11:47*	*11/13/17 03:56*	*1*

Client Sample ID: NAWC-110217-RW-355 — Lab Sample ID: 320-33018-11

Date Collected: 11/02/17 10:40 **Matrix: Water**
Date Received: 11/03/17 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**9.2**	**J**	40	6.8	ng/L		11/08/17 11:47	11/13/17 04:01	1
Perfluorooctanoic acid (PFOA)	**7.8**	**J**	20	2.8	ng/L		11/08/17 11:47	11/13/17 04:01	1
Perfluorononanoic acid (PFNA)	20	U M	24	8.0	ng/L		11/08/17 11:47	11/13/17 04:01	1
Perfluorohexanesulfonic acid (PFHxS)	**6.1**	**J**	30	5.5	ng/L		11/08/17 11:47	11/13/17 04:01	1
Perfluoroheptanoic acid (PFHpA)	**2.3**	**J M**	10	1.9	ng/L		11/08/17 11:47	11/13/17 04:01	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		11/08/17 11:47	11/13/17 04:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*77*		*70 - 130*	*11/08/17 11:47*	*11/13/17 04:01*	*1*
13C2 PFDA	*82*		*70 - 130*	*11/08/17 11:47*	*11/13/17 04:01*	*1*

Client Sample ID: NAWC-110217-FRB-355 — Lab Sample ID: 320-33018-12

Date Collected: 11/02/17 10:35 **Matrix: Water**
Date Received: 11/03/17 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	41	6.9	ng/L		11/08/17 11:47	11/13/17 04:06	1
Perfluorooctanoic acid (PFOA)	8.2	U	20	2.9	ng/L		11/08/17 11:47	11/13/17 04:06	1
Perfluorononanoic acid (PFNA)	20	U	24	8.2	ng/L		11/08/17 11:47	11/13/17 04:06	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	31	5.6	ng/L		11/08/17 11:47	11/13/17 04:06	1
Perfluoroheptanoic acid (PFHpA)	4.1	U	10	1.9	ng/L		11/08/17 11:47	11/13/17 04:06	1
Perfluorobutanesulfonic acid (PFBS)	37	U	92	16	ng/L		11/08/17 11:47	11/13/17 04:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*89*		*70 - 130*	*11/08/17 11:47*	*11/13/17 04:06*	*1*
13C2 PFDA	*82*		*70 - 130*	*11/08/17 11:47*	*11/13/17 04:06*	*1*

Client Sample ID: NAWC-110217-RW-348 — Lab Sample ID: 320-33018-13

Date Collected: 11/02/17 11:40 **Matrix: Water**
Date Received: 11/03/17 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**33**	**J**	40	6.8	ng/L		11/08/17 11:47	11/13/17 04:10	1
Perfluorooctanoic acid (PFOA)	**19**	**J**	20	2.8	ng/L		11/08/17 11:47	11/13/17 04:10	1
Perfluorononanoic acid (PFNA)	20	U M	24	8.0	ng/L		11/08/17 11:47	11/13/17 04:10	1
Perfluorohexanesulfonic acid (PFHxS)	**10**	**J**	30	5.5	ng/L		11/08/17 11:47	11/13/17 04:10	1
Perfluoroheptanoic acid (PFHpA)	**4.7**	**J**	10	1.9	ng/L		11/08/17 11:47	11/13/17 04:10	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		11/08/17 11:47	11/13/17 04:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*82*		*70 - 130*	*11/08/17 11:47*	*11/13/17 04:10*	*1*
13C2 PFDA	*83*		*70 - 130*	*11/08/17 11:47*	*11/13/17 04:10*	*1*

Client Sample ID: NAWC-110217-FRB-348 — Lab Sample ID: 320-33018-14

Date Collected: 11/02/17 11:35 **Matrix: Water**
Date Received: 11/03/17 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.7	ng/L		11/08/17 11:47	11/13/17 04:15	1
Perfluorooctanoic acid (PFOA)	7.9	U	20	2.8	ng/L		11/08/17 11:47	11/13/17 04:15	1
Perfluorononanoic acid (PFNA)	20	U	24	7.9	ng/L		11/08/17 11:47	11/13/17 04:15	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.4	ng/L		11/08/17 11:47	11/13/17 04:15	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	9.9	1.9	ng/L		11/08/17 11:47	11/13/17 04:15	1
Perfluorobutanesulfonic acid (PFBS)	36	U	89	16	ng/L		11/08/17 11:47	11/13/17 04:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*90*		*70 - 130*	*11/08/17 11:47*	*11/13/17 04:15*	*1*
13C2 PFDA	*88*		*70 - 130*	*11/08/17 11:47*	*11/13/17 04:15*	*1*

Client Sample ID: WGNA-110217-RW-3882 — Lab Sample ID: 320-33018-15

Date Collected: 11/02/17 15:40 **Matrix: Water**
Date Received: 11/03/17 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**9.0**	**J**	40	6.8	ng/L		11/08/17 11:47	11/13/17 04:20	1
Perfluorooctanoic acid (PFOA)	**7.1**	**J**	20	2.8	ng/L		11/08/17 11:47	11/13/17 04:20	1
Perfluorononanoic acid (PFNA)	20	U M	24	8.0	ng/L		11/08/17 11:47	11/13/17 04:20	1
Perfluorohexanesulfonic acid (PFHxS)	**8.2**	**J**	30	5.5	ng/L		11/08/17 11:47	11/13/17 04:20	1
Perfluoroheptanoic acid (PFHpA)	**3.7**	**J**	10	1.9	ng/L		11/08/17 11:47	11/13/17 04:20	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		11/08/17 11:47	11/13/17 04:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*83*		*70 - 130*	*11/08/17 11:47*	*11/13/17 04:20*	*1*
13C2 PFDA	*84*		*70 - 130*	*11/08/17 11:47*	*11/13/17 04:20*	*1*

Client Sample ID: WGNA-110217-FRB-3882 **Lab Sample ID: 320-33018-16**
Date Collected: 11/02/17 15:35 **Matrix: Water**
Date Received: 11/03/17 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.9	ng/L		11/08/17 11:47	11/13/17 04:24	1
Perfluorooctanoic acid (PFOA)	8.1	U	20	2.8	ng/L		11/08/17 11:47	11/13/17 04:24	1
Perfluorononanoic acid (PFNA)	20	U	24	8.1	ng/L		11/08/17 11:47	11/13/17 04:24	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		11/08/17 11:47	11/13/17 04:24	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		11/08/17 11:47	11/13/17 04:24	1
Perfluorobutanesulfonic acid (PFBS)	36	U	91	16	ng/L		11/08/17 11:47	11/13/17 04:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*85*		*70 - 130*	*11/08/17 11:47*	*11/13/17 04:24*	*1*
13C2 PFDA	*86*		*70 - 130*	*11/08/17 11:47*	*11/13/17 04:24*	*1*

Default Detection Limits

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-33018-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

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

Prep: 537

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	90	16	ng/L	537
Perfluoroheptanoic acid (PFHpA)	10	1.9	ng/L	537
Perfluorohexanesulfonic acid (PFHxS)	30	5.5	ng/L	537
Perfluorononanoic acid (PFNA)	24	8.0	ng/L	537
Perfluorooctanesulfonic acid (PFOS)	40	6.8	ng/L	537
Perfluorooctanoic acid (PFOA)	20	2.8	ng/L	537

Surrogate Summary

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

TestAmerica Job ID: 320-33018-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)									
		3C2 PFHx	3C2 PFDA								
Lab Sample ID	Client Sample ID	(70-130)	(70-130)								
320-33018-1	NAWC-110217-RW-286	84	79								
320-33018-2	NAWC-110217-FRB-286	84	85								
320-33018-3	WGNA-110217-RW-3978	78	85								
320-33018-4	WGNA-110217-FRB-3978	82	88								
320-33018-5	NAWC-110217-RW-177-IRR	60 Q	88								
320-33018-6	NAWC-110217-FRB-177-IRR	87	89								
320-33018-7	NAWC-110217-RW-177-SHOP	48 Q	84								
320-33018-8	NAWC-110217-FRB-177-SHOP	84	87								
320-33018-9	NAWC-110217-RW-185	77	82								
320-33018-10	NAWC-110217-FRB-185	87	88								
320-33018-11	NAWC-110217-RW-355	77	82								
320-33018-12	NAWC-110217-FRB-355	89	82								
320-33018-13	NAWC-110217-RW-348	82	83								
320-33018-14	NAWC-110217-FRB-348	90	88								
320-33018-15	WGNA-110217-RW-3882	83	84								
320-33018-16	WGNA-110217-FRB-3882	85	86								
LCS 320-193512/2-A	Lab Control Sample	89	87								
LCSD 320-193512/3-A	Lab Control Sample Dup	87	87								
MB 320-193512/1-A	Method Blank	85	91								

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

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

Lab Sample ID: MB 320-193512/1-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 194241 **Prep Batch: 193512**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		11/08/17 11:47	11/13/17 02:51	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		11/08/17 11:47	11/13/17 02:51	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		11/08/17 11:47	11/13/17 02:51	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		11/08/17 11:47	11/13/17 02:51	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		11/08/17 11:47	11/13/17 02:51	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		11/08/17 11:47	11/13/17 02:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*85*		*70 - 130*	*11/08/17 11:47*	*11/13/17 02:51*	*1*
13C2 PFDA	*91*		*70 - 130*	*11/08/17 11:47*	*11/13/17 02:51*	*1*

Lab Sample ID: LCS 320-193512/2-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 194241 **Prep Batch: 193512**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	222	210	M	ng/L		95	70 - 130
Perfluorooctanoic acid (PFOA)	111	105		ng/L		94	70 - 130
Perfluorononanoic acid (PFNA)	111	103		ng/L		93	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	167	165		ng/L		99	70 - 130
Perfluoroheptanoic acid (PFHpA)	55.6	51.7		ng/L		93	70 - 130
Perfluorobutanesulfonic acid (PFBS)	500	473		ng/L		95	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*89*		*70 - 130*
13C2 PFDA	*87*		*70 - 130*

Lab Sample ID: LCSD 320-193512/3-A **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 194241 **Prep Batch: 193512**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	222	215	M	ng/L		97	70 - 130	2	30
Perfluorooctanoic acid (PFOA)	111	103		ng/L		93	70 - 130	2	30
Perfluorononanoic acid (PFNA)	111	106		ng/L		95	70 - 130	2	30
Perfluorohexanesulfonic acid (PFHxS)	167	169		ng/L		102	70 - 130	3	30
Perfluoroheptanoic acid (PFHpA)	55.6	52.2		ng/L		94	70 - 130	1	30
Perfluorobutanesulfonic acid (PFBS)	500	480		ng/L		96	70 - 130	1	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*87*		*70 - 130*
13C2 PFDA	*87*		*70 - 130*

LCMS

Prep Batch: 193512

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-33018-1	NAWC-110217-RW-286	Total/NA	Water	537	
320-33018-2	NAWC-110217-FRB-286	Total/NA	Water	537	
320-33018-3	WGNA-110217-RW-3978	Total/NA	Water	537	
320-33018-4	WGNA-110217-FRB-3978	Total/NA	Water	537	
320-33018-5	NAWC-110217-RW-177-IRR	Total/NA	Water	537	
320-33018-6	NAWC-110217-FRB-177-IRR	Total/NA	Water	537	
320-33018-7	NAWC-110217-RW-177-SHOP	Total/NA	Water	537	
320-33018-8	NAWC-110217-FRB-177-SHOP	Total/NA	Water	537	
320-33018-9	NAWC-110217-RW-185	Total/NA	Water	537	
320-33018-10	NAWC-110217-FRB-185	Total/NA	Water	537	
320-33018-11	NAWC-110217-RW-355	Total/NA	Water	537	
320-33018-12	NAWC-110217-FRB-355	Total/NA	Water	537	
320-33018-13	NAWC-110217-RW-348	Total/NA	Water	537	
320-33018-14	NAWC-110217-FRB-348	Total/NA	Water	537	
320-33018-15	WGNA-110217-RW-3882	Total/NA	Water	537	
320-33018-16	WGNA-110217-FRB-3882	Total/NA	Water	537	
MB 320-193512/1-A	Method Blank	Total/NA	Water	537	
LCS 320-193512/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-193512/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 194241

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-33018-1	NAWC-110217-RW-286	Total/NA	Water	537	193512
320-33018-2	NAWC-110217-FRB-286	Total/NA	Water	537	193512
320-33018-3	WGNA-110217-RW-3978	Total/NA	Water	537	193512
320-33018-4	WGNA-110217-FRB-3978	Total/NA	Water	537	193512
320-33018-5	NAWC-110217-RW-177-IRR	Total/NA	Water	537	193512
320-33018-6	NAWC-110217-FRB-177-IRR	Total/NA	Water	537	193512
320-33018-7	NAWC-110217-RW-177-SHOP	Total/NA	Water	537	193512
MB 320-193512/1-A	Method Blank	Total/NA	Water	537	193512
LCS 320-193512/2-A	Lab Control Sample	Total/NA	Water	537	193512
LCSD 320-193512/3-A	Lab Control Sample Dup	Total/NA	Water	537	193512

Analysis Batch: 194251

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-33018-8	NAWC-110217-FRB-177-SHOP	Total/NA	Water	537	193512
320-33018-9	NAWC-110217-RW-185	Total/NA	Water	537	193512
320-33018-10	NAWC-110217-FRB-185	Total/NA	Water	537	193512
320-33018-11	NAWC-110217-RW-355	Total/NA	Water	537	193512
320-33018-12	NAWC-110217-FRB-355	Total/NA	Water	537	193512
320-33018-13	NAWC-110217-RW-348	Total/NA	Water	537	193512
320-33018-14	NAWC-110217-FRB-348	Total/NA	Water	537	193512
320-33018-15	WGNA-110217-RW-3882	Total/NA	Water	537	193512
320-33018-16	WGNA-110217-FRB-3882	Total/NA	Water	537	193512

Lab Chronicle

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

TestAmerica Job ID: 320-33018-1

Client Sample ID: NAWC-110217-RW-286
Lab Sample ID: 320-33018-1
Date Collected: 11/02/17 08:10
Matrix: Water
Date Received: 11/03/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			193512	11/08/17 11:47	KMK	TAL SAC
Total/NA	Analysis	537		1	194241	11/13/17 03:05	JRB	TAL SAC

Client Sample ID: NAWC-110217-FRB-286
Lab Sample ID: 320-33018-2
Date Collected: 11/02/17 08:05
Matrix: Water
Date Received: 11/03/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			193512	11/08/17 11:47	KMK	TAL SAC
Total/NA	Analysis	537		1	194241	11/13/17 03:09	JRB	TAL SAC

Client Sample ID: WGNA-110217-RW-3978
Lab Sample ID: 320-33018-3
Date Collected: 11/02/17 08:40
Matrix: Water
Date Received: 11/03/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			193512	11/08/17 11:47	KMK	TAL SAC
Total/NA	Analysis	537		1	194241	11/13/17 03:14	JRB	TAL SAC

Client Sample ID: WGNA-110217-FRB-3978
Lab Sample ID: 320-33018-4
Date Collected: 11/02/17 08:35
Matrix: Water
Date Received: 11/03/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			193512	11/08/17 11:47	KMK	TAL SAC
Total/NA	Analysis	537		1	194241	11/13/17 03:19	JRB	TAL SAC

Client Sample ID: NAWC-110217-RW-177-IRR
Lab Sample ID: 320-33018-5
Date Collected: 11/02/17 09:10
Matrix: Water
Date Received: 11/03/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			193512	11/08/17 11:47	KMK	TAL SAC
Total/NA	Analysis	537		1	194241	11/13/17 03:24	JRB	TAL SAC

Client Sample ID: NAWC-110217-FRB-177-IRR
Lab Sample ID: 320-33018-6
Date Collected: 11/02/17 09:05
Matrix: Water
Date Received: 11/03/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			193512	11/08/17 11:47	KMK	TAL SAC
Total/NA	Analysis	537		1	194241	11/13/17 03:28	JRB	TAL SAC

Client Sample ID: NAWC-110217-RW-177-SHOP — Lab Sample ID: 320-33018-7

Date Collected: 11/02/17 09:20 — **Matrix: Water**
Date Received: 11/03/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			193512	11/08/17 11:47	KMK	TAL SAC
Total/NA	Analysis	537		1	194241	11/13/17 03:33	JRB	TAL SAC

Client Sample ID: NAWC-110217-FRB-177-SHOP — Lab Sample ID: 320-33018-8

Date Collected: 11/02/17 09:15 — **Matrix: Water**
Date Received: 11/03/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			193512	11/08/17 11:47	KMK	TAL SAC
Total/NA	Analysis	537		1	194251	11/13/17 03:47	JRB	TAL SAC

Client Sample ID: NAWC-110217-RW-185 — Lab Sample ID: 320-33018-9

Date Collected: 11/02/17 10:10 — **Matrix: Water**
Date Received: 11/03/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			193512	11/08/17 11:47	KMK	TAL SAC
Total/NA	Analysis	537		1	194251	11/13/17 03:52	JRB	TAL SAC

Client Sample ID: NAWC-110217-FRB-185 — Lab Sample ID: 320-33018-10

Date Collected: 11/02/17 10:05 — **Matrix: Water**
Date Received: 11/03/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			193512	11/08/17 11:47	KMK	TAL SAC
Total/NA	Analysis	537		1	194251	11/13/17 03:56	JRB	TAL SAC

Client Sample ID: NAWC-110217-RW-355 — Lab Sample ID: 320-33018-11

Date Collected: 11/02/17 10:40 — **Matrix: Water**
Date Received: 11/03/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			193512	11/08/17 11:47	KMK	TAL SAC
Total/NA	Analysis	537		1	194251	11/13/17 04:01	JRB	TAL SAC

Client Sample ID: NAWC-110217-FRB-355 — Lab Sample ID: 320-33018-12

Date Collected: 11/02/17 10:35 — **Matrix: Water**
Date Received: 11/03/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			193512	11/08/17 11:47	KMK	TAL SAC
Total/NA	Analysis	537		1	194251	11/13/17 04:06	JRB	TAL SAC

Lab Chronicle

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

TestAmerica Job ID: 320-33018-1

Client Sample ID: NAWC-110217-RW-348
Lab Sample ID: 320-33018-13
Date Collected: 11/02/17 11:40
Matrix: Water
Date Received: 11/03/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			193512	11/08/17 11:47	KMK	TAL SAC
Total/NA	Analysis	537		1	194251	11/13/17 04:10	JRB	TAL SAC

Client Sample ID: NAWC-110217-FRB-348
Lab Sample ID: 320-33018-14
Date Collected: 11/02/17 11:35
Matrix: Water
Date Received: 11/03/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			193512	11/08/17 11:47	KMK	TAL SAC
Total/NA	Analysis	537		1	194251	11/13/17 04:15	JRB	TAL SAC

Client Sample ID: WGNA-110217-RW-3882
Lab Sample ID: 320-33018-15
Date Collected: 11/02/17 15:40
Matrix: Water
Date Received: 11/03/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			193512	11/08/17 11:47	KMK	TAL SAC
Total/NA	Analysis	537		1	194251	11/13/17 04:20	JRB	TAL SAC

Client Sample ID: WGNA-110217-FRB-3882
Lab Sample ID: 320-33018-16
Date Collected: 11/02/17 15:35
Matrix: Water
Date Received: 11/03/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			193512	11/08/17 11:47	KMK	TAL SAC
Total/NA	Analysis	537		1	194251	11/13/17 04:24	JRB	TAL SAC

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

Accreditation/Certification Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-33018-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4040	01-28-18

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
537	537	Water	Perfluorobutanesulfonic acid (PFBS)
537	537	Water	Perfluoroheptanoic acid (PFHpA)
537	537	Water	Perfluorohexanesulfonic acid (PFHxS)
537	537	Water	Perfluorononanoic acid (PFNA)
537	537	Water	Perfluorooctanesulfonic acid (PFOS)
537	537	Water	Perfluorooctanoic acid (PFOA)

Method Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-33018-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

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: Tetra Tech, Inc. TestAmerica Job ID: 320-33018-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-33018-1	NAWC-110217-RW-286	Water	11/02/17 08:10	11/03/17 09:40
320-33018-2	NAWC-110217-FRB-286	Water	11/02/17 08:05	11/03/17 09:40
320-33018-3	WGNA-110217-RW-3978	Water	11/02/17 08:40	11/03/17 09:40
320-33018-4	WGNA-110217-FRB-3978	Water	11/02/17 08:35	11/03/17 09:40
320-33018-5	NAWC-110217-RW-177-IRR	Water	11/02/17 09:10	11/03/17 09:40
320-33018-6	NAWC-110217-FRB-177-IRR	Water	11/02/17 09:05	11/03/17 09:40
320-33018-7	NAWC-110217-RW-177-SHOP	Water	11/02/17 09:20	11/03/17 09:40
320-33018-8	NAWC-110217-FRB-177-SHOP	Water	11/02/17 09:15	11/03/17 09:40
320-33018-9	NAWC-110217-RW-185	Water	11/02/17 10:10	11/03/17 09:40
320-33018-10	NAWC-110217-FRB-185	Water	11/02/17 10:05	11/03/17 09:40
320-33018-11	NAWC-110217-RW-355	Water	11/02/17 10:40	11/03/17 09:40
320-33018-12	NAWC-110217-FRB-355	Water	11/02/17 10:35	11/03/17 09:40
320-33018-13	NAWC-110217-RW-348	Water	11/02/17 11:40	11/03/17 09:40
320-33018-14	NAWC-110217-FRB-348	Water	11/02/17 11:35	11/03/17 09:40
320-33018-15	WGNA-110217-RW-3882	Water	11/02/17 15:40	11/03/17 09:40
320-33018-16	WGNA-110217-FRB-3882	Water	11/02/17 15:35	11/03/17 09:40

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 192908

Lab Sample ID: IC 320-192908/4 Client Sample ID:

Date Analyzed: 11/03/17 13:37 Lab File ID: 2017.11.03_537XICAL_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.16	Assign Peak	phomsopha t	11/06/17 07:17

Lab Sample ID: IC 320-192908/5 Client Sample ID:

Date Analyzed: 11/03/17 13:42 Lab File ID: 2017.11.03_537XICAL_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.16	Assign Peak	phomsopha t	11/06/17 07:18

Lab Sample ID: IC 320-192908/7 ICISAV Client Sample ID:

Date Analyzed: 11/03/17 13:52 Lab File ID: 2017.11.03_537XICAL_007.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.16	Assign Peak	phomsopha t	11/06/17 07:20

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 194241

Lab Sample ID: CCVL 320-194241/1 Client Sample ID:

Date Analyzed: 11/13/17 02:37 Lab File ID: 2017.11.13_537A_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.13	Incomplete Integration	phomsopha t	11/13/17 11:09

Lab Sample ID: CCV 320-194241/2 CCVIS Client Sample ID:

Date Analyzed: 11/13/17 02:41 Lab File ID: 2017.11.13_537A_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.13	Isomers	barnettj	11/14/17 16:55

Lab Sample ID: LCS 320-193512/2-A Client Sample ID:

Date Analyzed: 11/13/17 02:55 Lab File ID: 2017.11.13_537A_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.12	Isomers	barnettj	11/14/17 16:56

Lab Sample ID: LCSD 320-193512/3-A Client Sample ID:

Date Analyzed: 11/13/17 03:00 Lab File ID: 2017.11.13_537A_009.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.12	Missed Peak	barnettj	11/14/17 16:56

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 194241

Lab Sample ID: 320-33018-1 Client Sample ID: NAWC-110217-RW-286

Date Analyzed: 11/13/17 03:05 Lab File ID: 2017.11.13_537A_010.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.13	Isomers	barnettj	11/14/17 16:55
Perfluorononanoic acid (PFNA)	2.14	Baseline	barnettj	11/14/17 16:57

Lab Sample ID: 320-33018-3 Client Sample ID: WGNA-110217-RW-3978

Date Analyzed: 11/13/17 03:14 Lab File ID: 2017.11.13_537A_012.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.12	Isomers	barnettj	11/14/17 16:58
Perfluorononanoic acid (PFNA)	2.13	Missed Peak	barnettj	11/14/17 16:58

Lab Sample ID: 320-33018-5 Client Sample ID: NAWC-110217-RW-177-IRR

Date Analyzed: 11/13/17 03:24 Lab File ID: 2017.11.13_537A_014.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	1.70	Baseline	barnettj	11/14/17 16:59
Perfluorooctanesulfonic acid (PFOS)	2.12	Missed Peak	barnettj	11/14/17 16:59
Perfluorononanoic acid (PFNA)	2.13	Missed Peak	barnettj	11/14/17 17:00

Lab Sample ID: 320-33018-7 Client Sample ID: NAWC-110217-RW-177-SHOP

Date Analyzed: 11/13/17 03:33 Lab File ID: 2017.11.13_537A_016.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	2.12	Missed Peak	barnettj	11/14/17 17:01

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 194241

Lab Sample ID: CCV 320-194241/14 CCVIS Client Sample ID:

Date Analyzed: 11/13/17 03:38 Lab File ID: 2017.11.13_537A_017.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.12	Missed Peak	barnettj	11/14/17 17:02

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 194251

Lab Sample ID: CCV 320-194251/14 CCVIS Client Sample ID:

Date Analyzed: 11/13/17 03:38 Lab File ID: 2017.11.13_537A_017.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.12	Missed Peak	barnettj	11/14/17 17:02

Lab Sample ID: 320-33018-9 Client Sample ID: NAWC-110217-RW-185

Date Analyzed: 11/13/17 03:52 Lab File ID: 2017.11.13_537A_020.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	2.13	Split Peak	barnettj	11/14/17 17:02

Lab Sample ID: 320-33018-11 Client Sample ID: NAWC-110217-RW-355

Date Analyzed: 11/13/17 04:01 Lab File ID: 2017.11.13_537A_022.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	1.71	Missed Peak	barnettj	11/14/17 17:03
Perfluorononanoic acid (PFNA)	2.13	Missed Peak	barnettj	11/14/17 17:03

Lab Sample ID: 320-33018-13 Client Sample ID: NAWC-110217-RW-348

Date Analyzed: 11/13/17 04:10 Lab File ID: 2017.11.13_537A_024.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	2.12	Baseline	barnettj	11/14/17 17:04

Lab Sample ID: 320-33018-15 Client Sample ID: WGNA-110217-RW-3882

Date Analyzed: 11/13/17 04:20 Lab File ID: 2017.11.13_537A_026.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	2.12	Missed Peak	barnettj	11/14/17 17:05

537

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-HSP_00023	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	Perfluorobutane Sulfonate	1250.1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL
.LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutane Sulfonate	90 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
..LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutane Sulfonate	2 mg/mL
							Perfluorobutanesulfonic acid (PFBS)	2 mg/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_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
...LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
..LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
...LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
..LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537_PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
...LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
..LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537_PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
...LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
..LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
...LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
LC537-ICV_00028	01/05/18	08/02/17	MeOH/H2O, Lot 067374	10 mL	LC537-IS_00045	1000 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
.LC537-IS_00045	01/05/18	07/05/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00019	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFOS_00019	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-ICV_00028	01/05/18	08/02/17	MeOH/H2O, Lot 067374	10 mL	LC537-SU_00046	1000 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
					LC537ICIM_00019	20 uL	Perfluorobutanesulfonic acid (PFBS)	100.119 ng/mL
							Perfluoroheptanoic acid (PFHpA)	9.99613 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	20.0761 ng/mL
							Perfluorononanoic acid (PFNA)	20.1272 ng/mL
							Perfluorooctanoic acid (PFOA)	20.4843 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	19.698 ng/mL
.LC537-SU_00046	01/05/18	07/05/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LC537ICIM_00019	01/25/18	08/01/17	Methanol, Lot 090285	25 mL	LC537-PFBS2_00008	0.6 mL	Perfluorobutanesulfonic acid (PFBS)	50.0597 ug/mL
					LC537-PFHpA2_00011	0.061 mL	Perfluoroheptanoic acid (PFHpA)	4.99806 ug/mL
					LC537-PFHxS2_00008	0.122 mL	Perfluorohexanesulfonic acid (PFHxS)	10.038 ug/mL
					LC537-PFNA2_00009	0.126 mL	Perfluorononanoic acid (PFNA)	10.0636 ug/mL
					LC537-PFOA2_00010	0.122 mL	Perfluorooctanoic acid (PFOA)	10.2421 ug/mL
					LC537-PFOS2_00010	0.124 mL	Perfluorooctanesulfonic acid (PFOS)	9.849 ug/mL
..LC537-PFBS2_00008	01/25/18	07/25/17	Methanol, Lot 090285	20 mL	LC537_PFBS2_00002	0.0418 g	Perfluorobutanesulfonic acid (PFBS)	2085.82 ug/mL
...LC537_PFBS2_00002	09/08/22	Santa Cruz Biotechnology, Lot F0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	0.998 g/g
..LC537-PFHpA2_00011	01/25/18	07/25/17	Methanol, Lot 09092	31 mL	LC537_PFHpA2_00002	0.0635 g	Perfluoroheptanoic acid (PFHpA)	2048.39 ug/mL
...LC537_PFHpA2_00002	06/13/22	Afla Aesar, Lot 10200390			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	1 g/g
..LC537-PFHxS2_00008	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537_PFHxS2_00002	0.0475 g	Perfluorohexanesulfonic acid (PFHxS)	2056.98 ug/mL
...LC537_PFHxS2_00002	06/08/22	Santa Cruz Biotechnology, Lot G2516			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
..LC537-PFNA2_00009	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537_PFNA2_00002	0.0421 g	Perfluorononanoic acid (PFNA)	1996.74 ug/mL
...LC537_PFNA2_00002	06/14/22	Aldrich, Lot MKCC0699			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.996 g/g
..LC537-PFOA2_00010	01/25/18	08/01/17	Methanol, Lot 090285	20 mL	LC537_PFOA2_00002	0.0424 g	Perfluorooctanoic acid (PFOA)	2098.8 ug/mL
...LC537_PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.99 g/g
..LC537-PFOS2_00010	01/25/18	08/01/17	Methanol, Lot 090285	22 mL	LC537_PFOS2_00002	0.0561 g	Perfluorooctanesulfonic acid (PFOS)	1985.68 ug/mL
...LC537_PFOS2_00002	06/14/22	Sigma, Lot BCBQ0108V			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.7787 g/g
LC537-IS_00050	03/20/18	09/20/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-L1_00020	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-MSP_00029	60 uL	Perfluorobutanesulfonic acid (PFBS)	9.0018 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1.00036 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	3.00103 ng/mL
							Perfluorononanoic acid (PFNA)	2.0006 ng/mL
							Perfluorooctanoic acid (PFOA)	2.00191 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.00146 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-MSP_00029	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	166.7 uL	Perfluorobutanesulfonic acid (PFBS)	750.15 ng/mL
							Perfluoroheptanoic acid (PFHpA)	83.3637 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	250.086 ng/mL
							Perfluorononanoic acid (PFNA)	166.716 ng/mL
							Perfluorooctanoic acid (PFOA)	166.826 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	333.455 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537_PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537_PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L2_00020	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	80 uL	Perfluorobutanesulfonic acid (PFBS)	20.0016 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.22277 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	6.66817 ng/mL
							Perfluorononanoic acid (PFNA)	4.44524 ng/mL
							Perfluorooctanoic acid (PFOA)	4.44816 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	8.89106 ng/mL
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537_PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537_PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537_PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537_PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L3_00023	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	180 uL	Perfluorobutanesulfonic acid (PFBS)	45.0036 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5.00122 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	15.0034 ng/mL
							Perfluorononanoic acid (PFNA)	10.0018 ng/mL
							Perfluorooctanoic acid (PFOA)	10.0084 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.0049 ng/mL
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537_PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537_PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L4_00020	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	360 uL	Perfluorobutanesulfonic acid (PFBS)	90.0072 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10.0024 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	30.0067 ng/mL
							Perfluorononanoic acid (PFNA)	20.0036 ng/mL
							Perfluorooctanoic acid (PFOA)	20.0167 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	40.0098 ng/mL
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537_PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537_PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L5_00024	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	540 uL	Perfluorobutanesulfonic acid (PFBS)	135.011 ng/mL
							Perfluoroheptanoic acid (PFHpA)	15.0037 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.0101 ng/mL
							Perfluorononanoic acid (PFNA)	30.0053 ng/mL
							Perfluorooctanoic acid (PFOA)	30.0251 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	60.0146 ng/mL
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537_PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537_PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L6_00020	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	720 uL	Perfluorobutanesulfonic acid (PFBS)	180.014 ng/mL
							Perfluoroheptanoic acid (PFHpA)	20.0049 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	60.0135 ng/mL
							Perfluorononanoic acid (PFNA)	40.0071 ng/mL
							Perfluorooctanoic acid (PFOA)	40.0334 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	80.0195 ng/mL
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537_PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537_PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-SU_00051	03/20/18	09/20/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
.LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Reagent

LC537_PFBS_00002

R: 4/1/15 SPV

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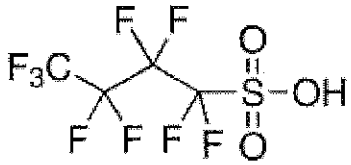
Website: www.sigmaaldrich.com
Email USA: techserv@sial.com
Outside USA: eurtechserv@sial.com

Certificate of Analysis

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

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



PFBS

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

Jamie Gleason

Jamie Gleason, Manager
Quality Control
Milwaukee, Wisconsin US

Reagent

LC537_PFBS2_00002

1:6817 SW

CERTIFICATE OF ANALYSIS

The Power to Question

Catalog Number:	sc-236187
Lot Number:	F0917
Product Name:	Nonafluorobutane-1-sulfonic acid
CAS Number:	375-73-5
Molecular Formula:	$C_4HF_9O_3S$
Molecular Weight:	300.10

Test	Specification	Result
Appearance	Colorless liquid	Complies
Identification (19F-NMR)	Conforms to structure	Complies
Purity (Sodium Hydroxide Titration)	≥ 97%	101.3%
Infrared Spectrum	Conforms to structure	Complies

Reagent

LC537_PFHpA_00002

P: 4/1/15 SRV

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Certificate of Analysis

PFHpA

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

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

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

Reagent

LC537_PFHpA2_00002

Alfa Aesar

Certificate of analysis

r: 6.13.17 SW

PFHp A

Product No.:	A12092
Product:	Perfluoroheptanoic acid, 98+%
Lot No.:	10200390

Appearance:	White fused solid
Water Content (Karl-Fischer):	0.30%
Melting Point:	32.0-34.3°C
Assay (Aqueous acid-base titration):	99.7%
Identification (FTIR):	Conforms

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Reagent

LC537_PFHxS_00002

R: 4/1/15 SKV

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Certificate of Analysis

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

PFH_xS-K

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

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

Purity = 90.94 / w/m.w correction

SKV 4/1/15

Reagent

LC537_PFHxS2_00002

n: 6.8.17 SKW

CERTIFICATE OF ANALYSIS

Catalog Number:	sc-237289
Lot Number:	G2516
Product Name:	Tridecafluorohexane-1-sulfonic acid potassium salt
CAS Number:	3871-99-6
Molecular Formula:	$C_6F_{13}KO_3S$
Molecular Weight:	438.20

Test	Specification	Result
Appearance	White to faint beige powder or crystals	White powder
Identification (Infrared Spectrum)	Consistent with structure	Complies
Purity (Titration, Ion Exchange)	≥ 98.0%	100.4%

$PFH_xS\text{-}K$

$C_6F_{13}SO_3K$ 438.201

$C_6F_{13}SO_3H$ 400.111

MW correction = $\frac{400.11}{438.201}$ = 0.91307 $\frac{PFH_xS}{\text{CasH } 355\text{-}46\text{-}4}$

Purity & MW correction = 90.9%

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Reagent

LC537_PFNA_00002

R: 4/1/15 SKV

Certificate of Analysis

Apr 2, 2015 (JST)

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

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

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

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

Customer service:

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

PFNA

Reagent

LC537_PFNA2_00002

P: 6.14.17 SKV

SIGMA-ALDRICH®

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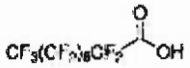
3050 Spruce Street, Saint Louis, MO 63103, USA
Website: www.sigmaaldrich.com
Email USA: techserv@sial.com
Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name:
Perfluorononanoic acid – 97%

Product Number:	**394459**
Batch Number:	**MKCC0699**
Brand:	ALDRICH
CAS Number:	375-95-1
MDL Number:	MFCD00039605
Formula:	C9HF17O2
Formula Weight:	464.08 g/mol
Quality Release Date:	07 DEC 2016



Test	Specification	Result
Appearance (Color)	White to Off-White	White
Appearance (Form)	Powder or Crystals or Crystalline Chunk(s) or Granule or Flakes or Solid	Powder
Infrared Spectrum	Conforms to Structure	Conforms
GC (area %)	≥ 96.5 %	98.2 %

Michael Grady, Manager
Quality Control
Milwaukee, WI US

PFNA

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_PFOA_00003

R: 11/30/16 SKV
PFOA

SIGMA-ALDRICH

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

Certificate of Analysis

Product Name:	PENTADECAFLUOROOCTANOIC ACID analytical standard
Product Number:	33824
Batch Number:	BCBS1198V
Brand:	Sigma-Aldrich
CAS Number:	335-67-1
Formula:	$CF_3(CF_2)_6COOH$
Formula Weight:	414.07
Expiration Date:	OCT 2023
Quality Release Date:	12 MAY 2016

TEST	SPECIFICATION	RESULT
PURITY (HPLC AREA %)	≥ 98.0%	100.0%
IDENTIFICATION (LC-MS)	IDENTITY CONFORMS	CONFORMS

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

Reagent

LC537_PFOA2_00002

Alfa Aesar

Certificate of analysis

R: 6/9/17 SK✓

PFOA

Product No.:	L08862
Product:	Perfluorooctanoic acid, 95%
Lot No.:	10199078

Appearance:	White powder
Water Content (Karl-Fischer):	1.30%
Melting Point:	47.6-54.0°C
Assay (Aqueous acid-base titration):	98.4%
Assay (GC Silyl Deriv):	97.2%

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ThermoFisher SCIENTIFIC

Reagent

LC537_PFOS_00003

r: 11/30/16 SV

PFOS

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CERTIFICATE OF ANALYSIS

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

Seelze, 22.04.2014/524107/14/08646

Order-No.:
Customer-No.:

Order-Code:

Quantity:

Production Date: 17.Apr.2014
Expiry Date: 17.Apr.2019

Article/Product: 33829 Batch : SZBE107XV

Heptadecafluorooctanesulfonic acid potassium salt OEKANAL®

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	22.Apr.2014

3. Advice and Remarks

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

Sigma-Aldrich Laborchemikalien GmbH
Quality Management SA-LC

Reagent

LC537_PFOS2_00002

R: 6.14.17 SKV

SIGMA-ALDRICH

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

Certificate of Analysis

Product Name:	HEPTADECAFLUOROOCTANESULFONIC ACID TETRAETHYLAMMONIUM SALT 98 %
Product Number:	365289
Batch Number:	BCBQ0108V
Brand:	Aldrich
CAS Number:	56773-42-3
Formula:	$CF_3(CF_2)_6CF_2SO_3N(C_2H_5)_4$
Formula Weight:	629.37
Quality Release Date:	11 JUN 2015

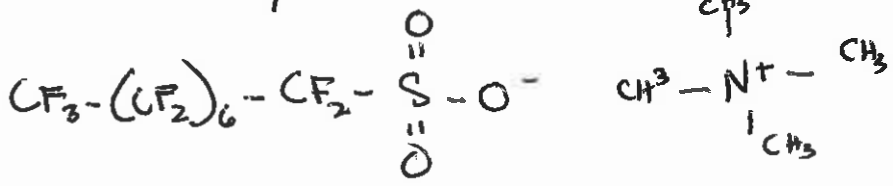
TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	WHITE TO OFF WHITE	OFF-WHITE
APPEARANCE (FORM)	POWDER OR POWDER WITH CHUNK(S)	POWDER
CARBON CONTENT	29.77 % - 31.29 %	29.97 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

Purity & MW correction = 77.87%



	$C_8F_{17}SO_3^+H$	$C_8H_{20}N$
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
	500.125	130.255

Reagent

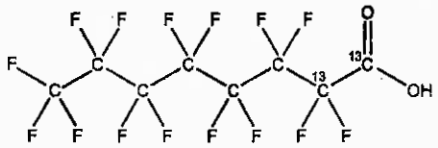
LCM2PFOA_00007

T: 5/6/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFOA	**LOT NUMBER:**	M2PFOA0216
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]octanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6HF_{15}O_2$	**MOLECULAR WEIGHT:**	416.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	02/12/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ B.G. Chittim **Date:** 02/24/2016 (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:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

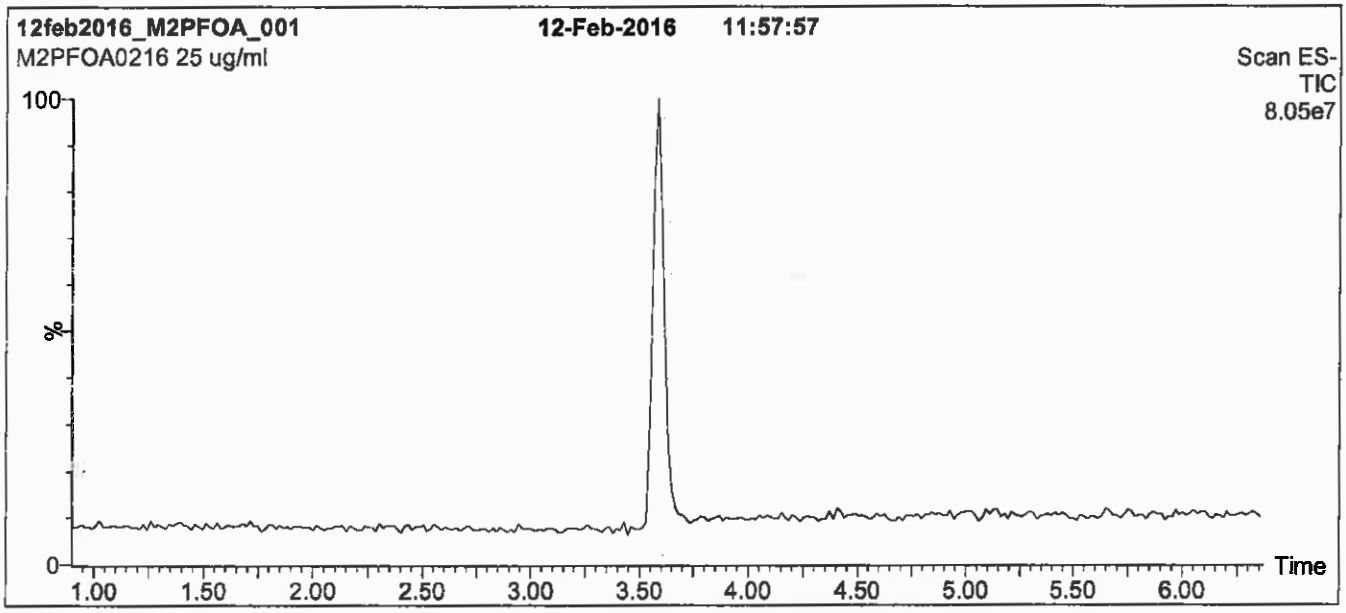
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

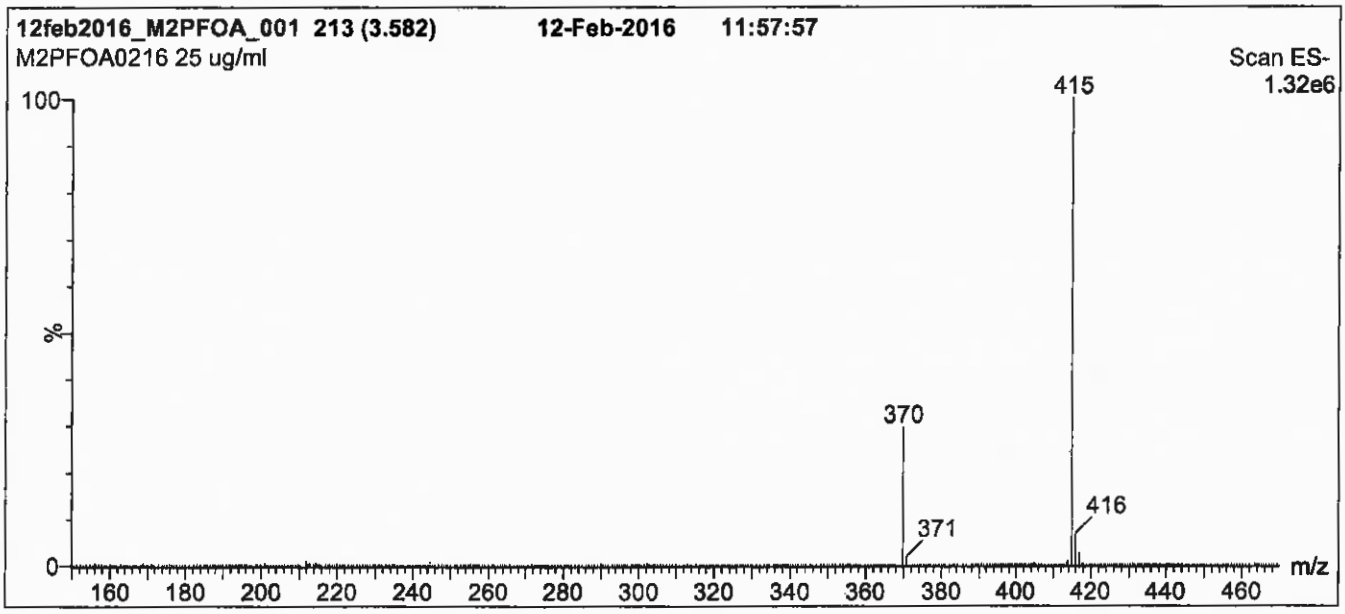
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

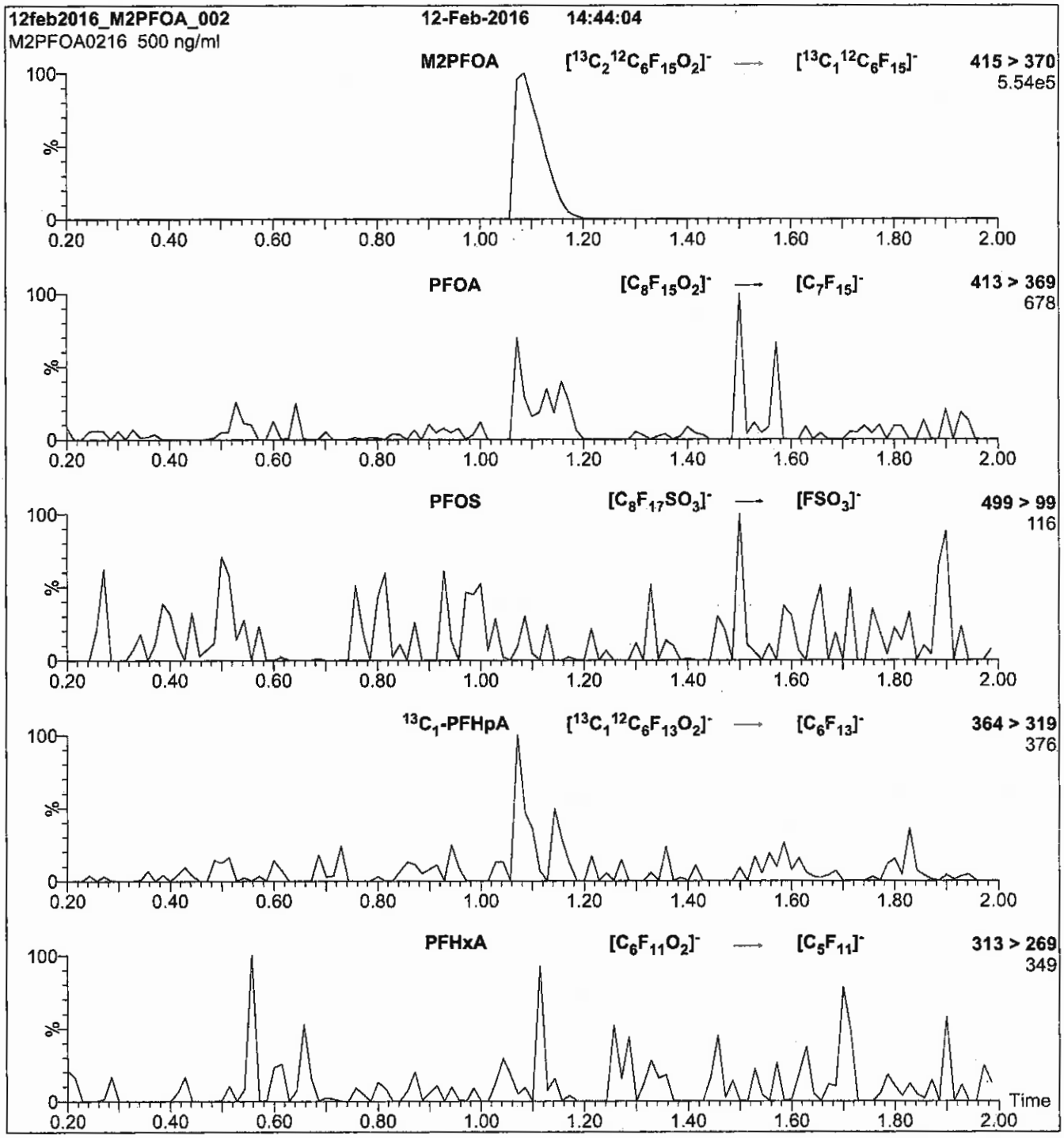
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
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% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFDA_00012

R: SBC 12/21/16

814255
ID: LCMPFDA_00012
Exp: 09/30/21 Prpd: SBC
13C2-Perfluorodecanoic a

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA0916
COMPOUND:	Perfluoro-*n*-[1,2-$^{13}C_2$]decanoic acid		
STRUCTURE:		**CAS #:**	Not available

MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of $^{13}C_1$-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/07/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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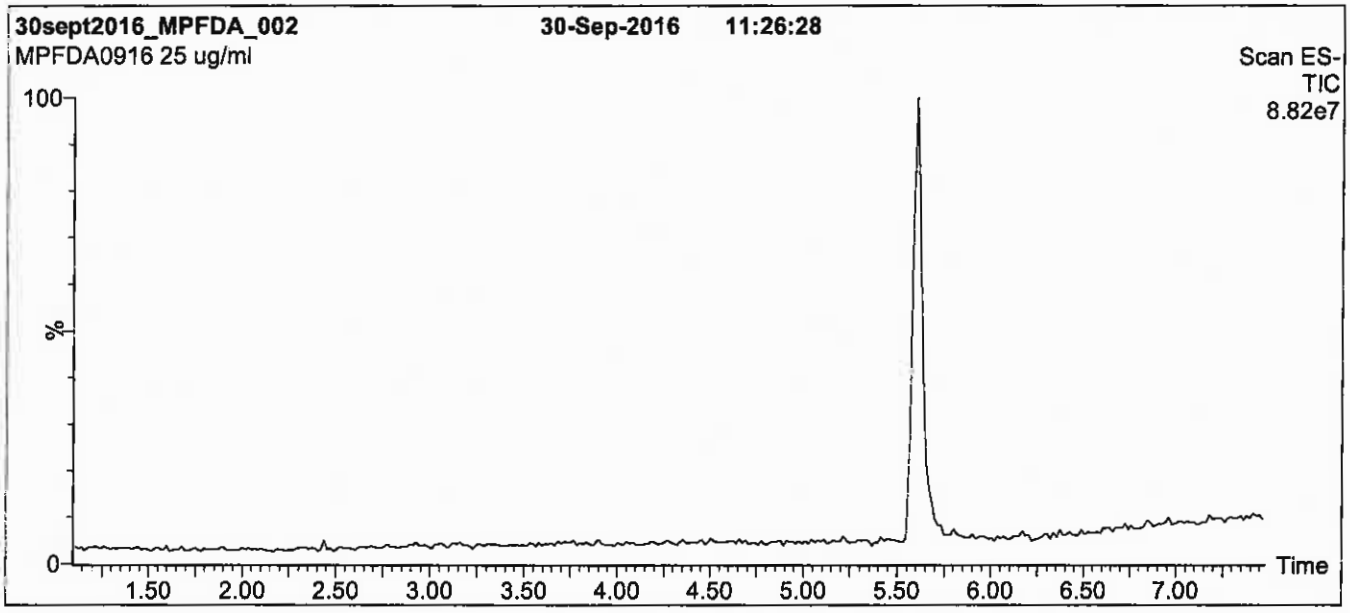
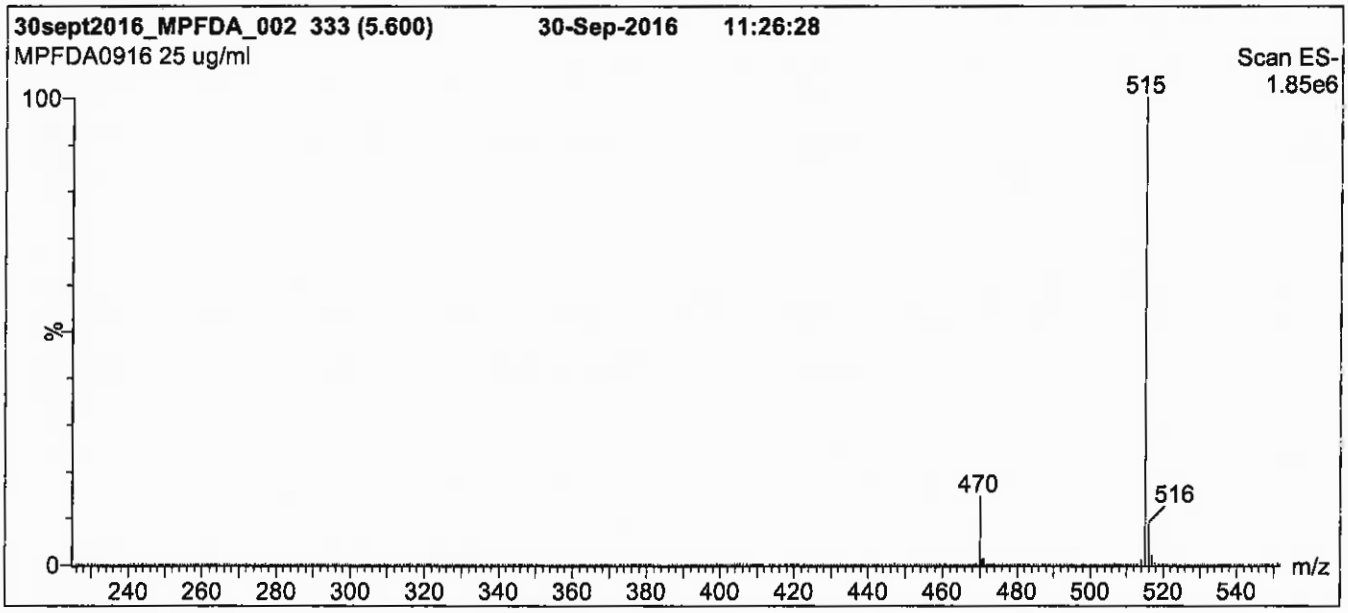
Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

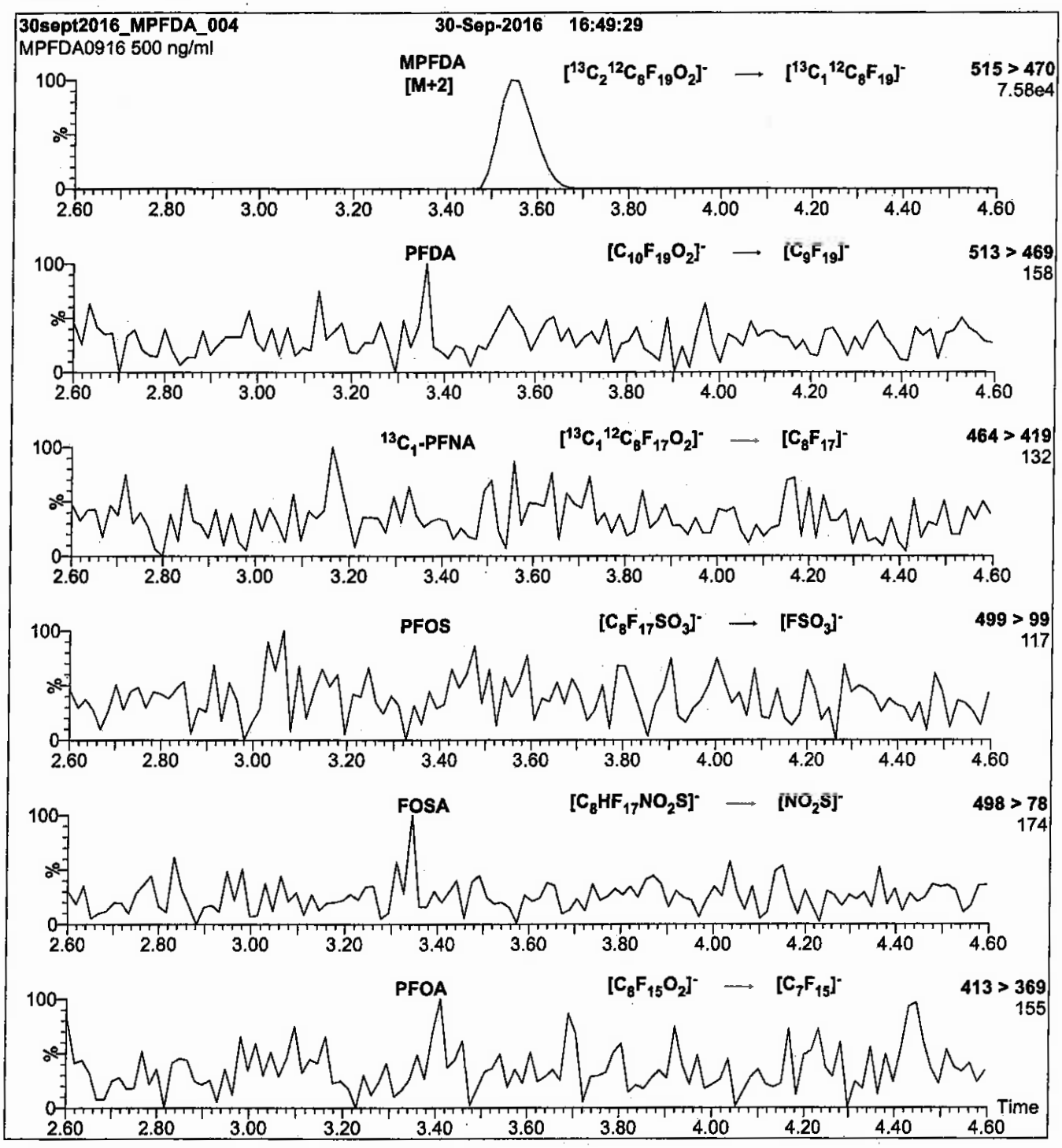
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFDA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

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

Reagent

LCMPFHxA_00013

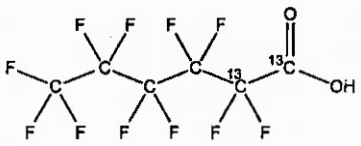
R: SBC 12/21/16

814258
ID: LCMPFHxA_00013
Exp: 04/08/21 Prpd: SBC
13C2-Perfluorohexanoic ac

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFHxA	**LOT NUMBER:**	MPFHxA0416
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_4HF_{11}O_2$	**MOLECULAR WEIGHT:**	316.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	04/08/2016		
EXPIRY DATE: (mm/dd/yyyy)	04/08/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-hexanoic acid and ~ 0.3% of perfluoro-n-octanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/29/2016 (mm/dd/yyyy)

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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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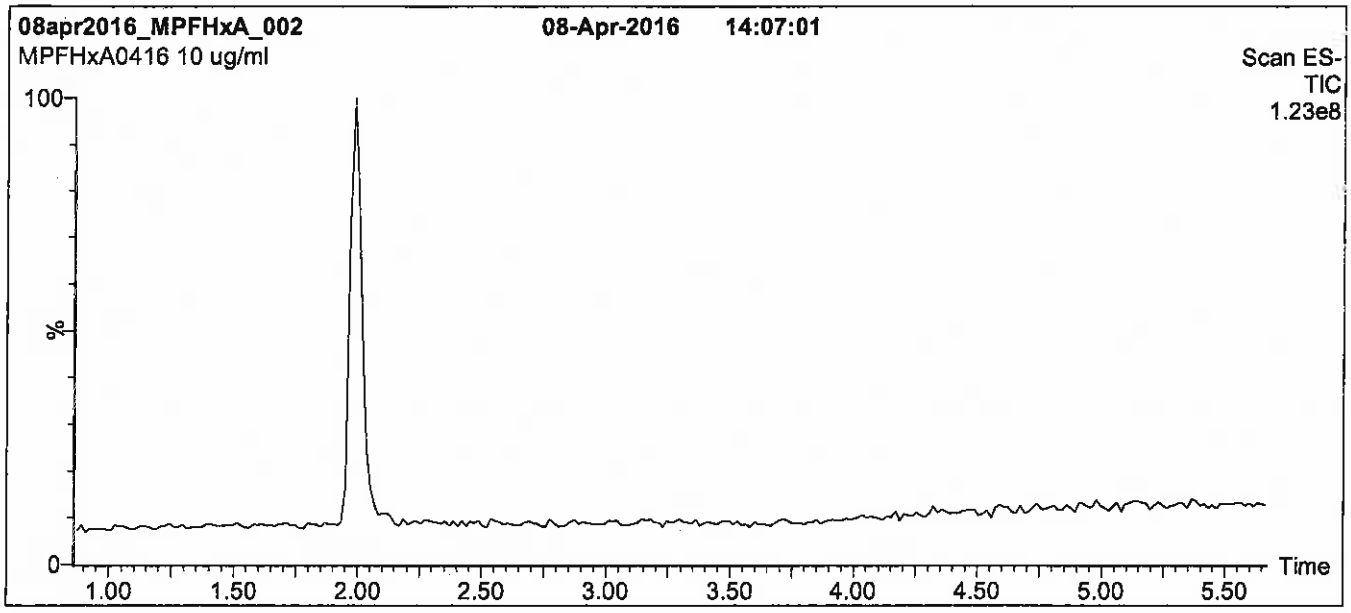

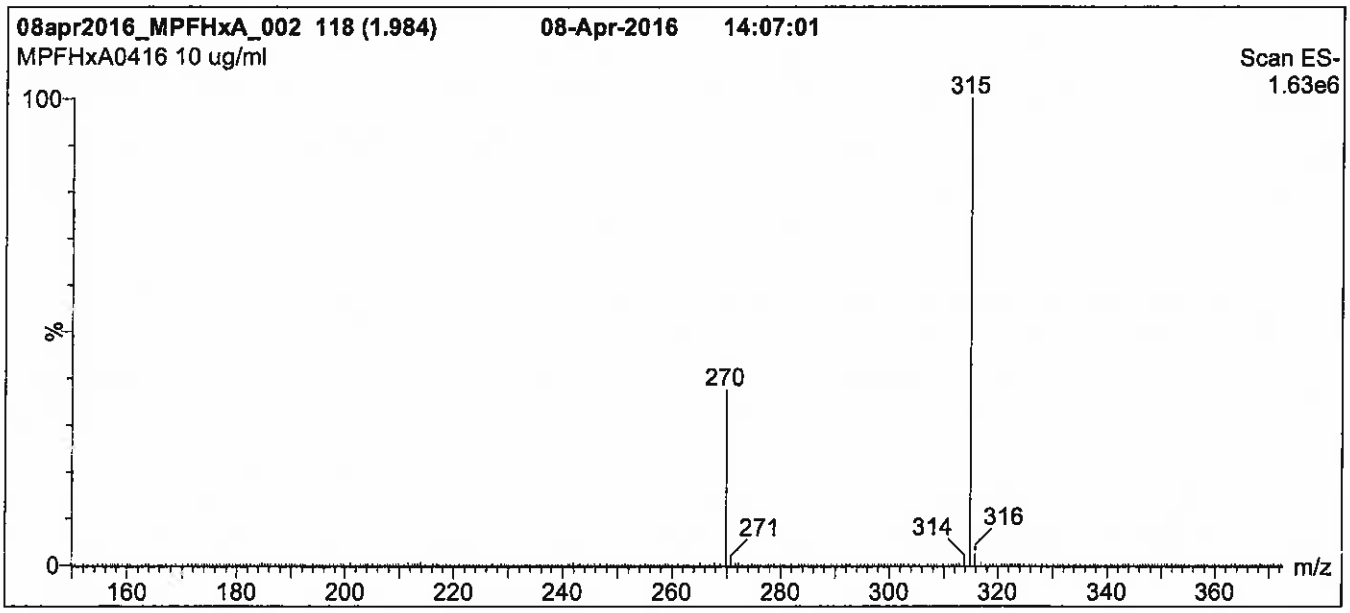

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1.7 µm, 2.1 x 100 mm

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Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions over 0.5 min.
Time: 10 min

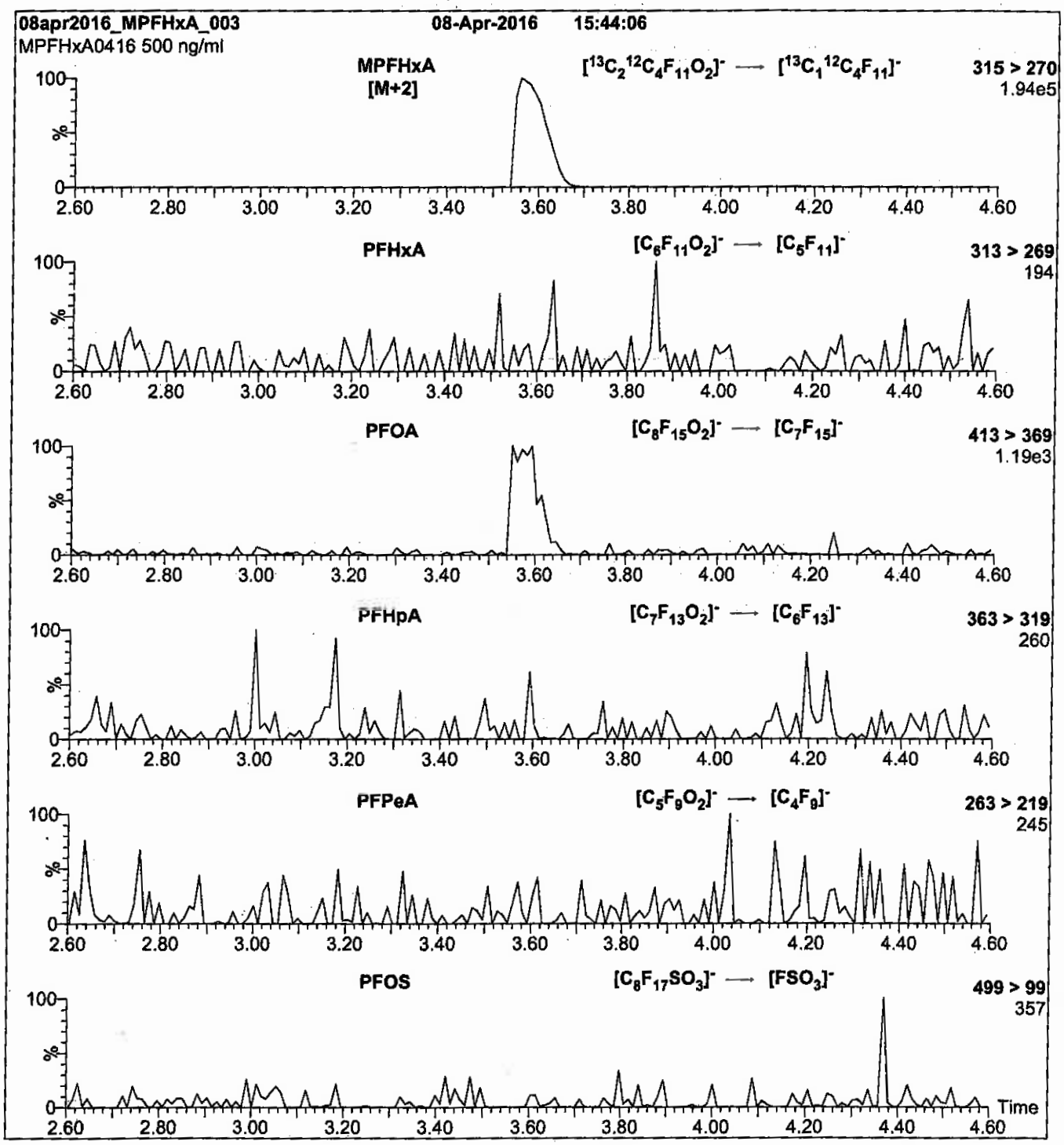
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFHxA_00015

r: 5/8/17 std

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

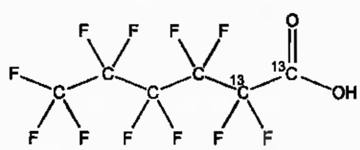
PRODUCT CODE: MPFHxA

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

LOT NUMBER: MPFHxA1116

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_4HF_{11}O_2$

CONCENTRATION: 50 ± 2.5 µg/ml

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 11/22/2016

EXPIRY DATE: (mm/dd/yyyy) 11/22/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 316.04

SOLVENT(S): Methanol
Water (<1%)

ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)

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: [signature] B.G. Chittim

Date: 12/13/2016 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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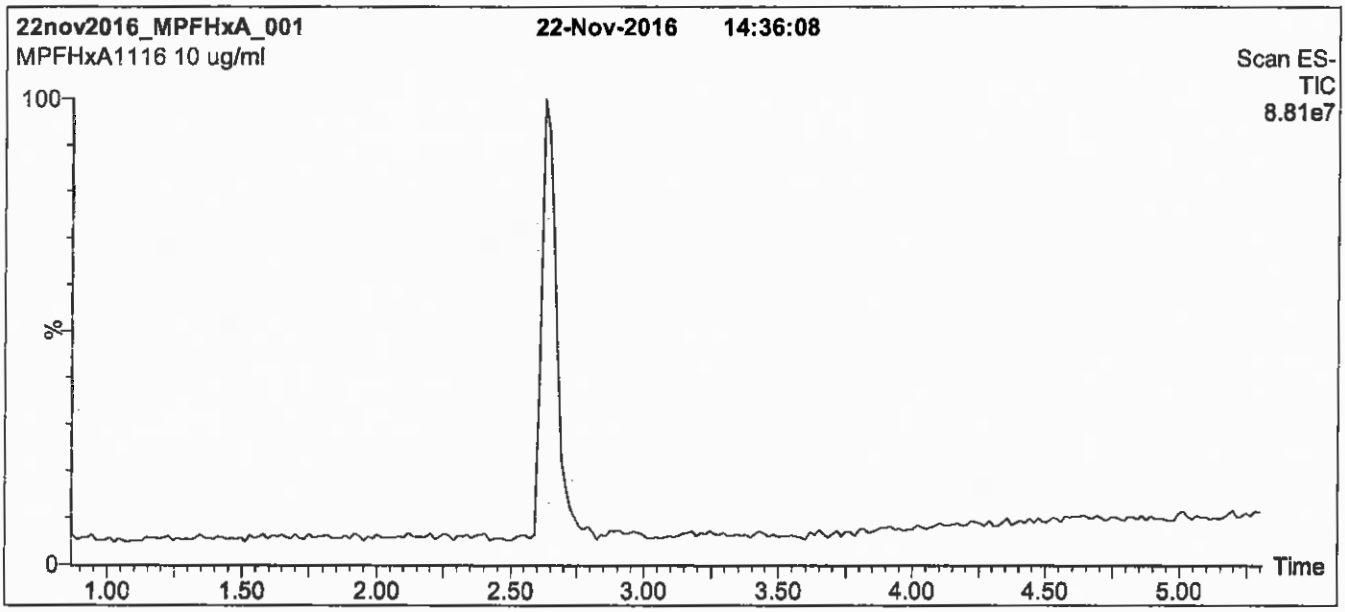
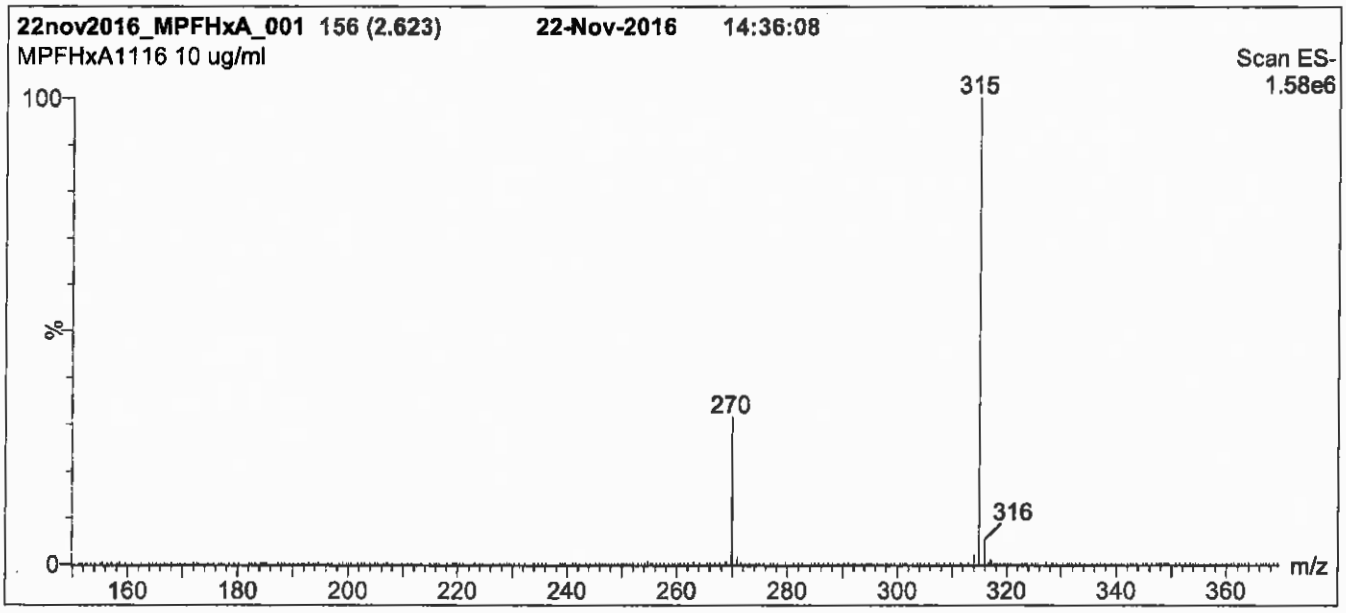
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions over 0.5 min.
Time: 10 min

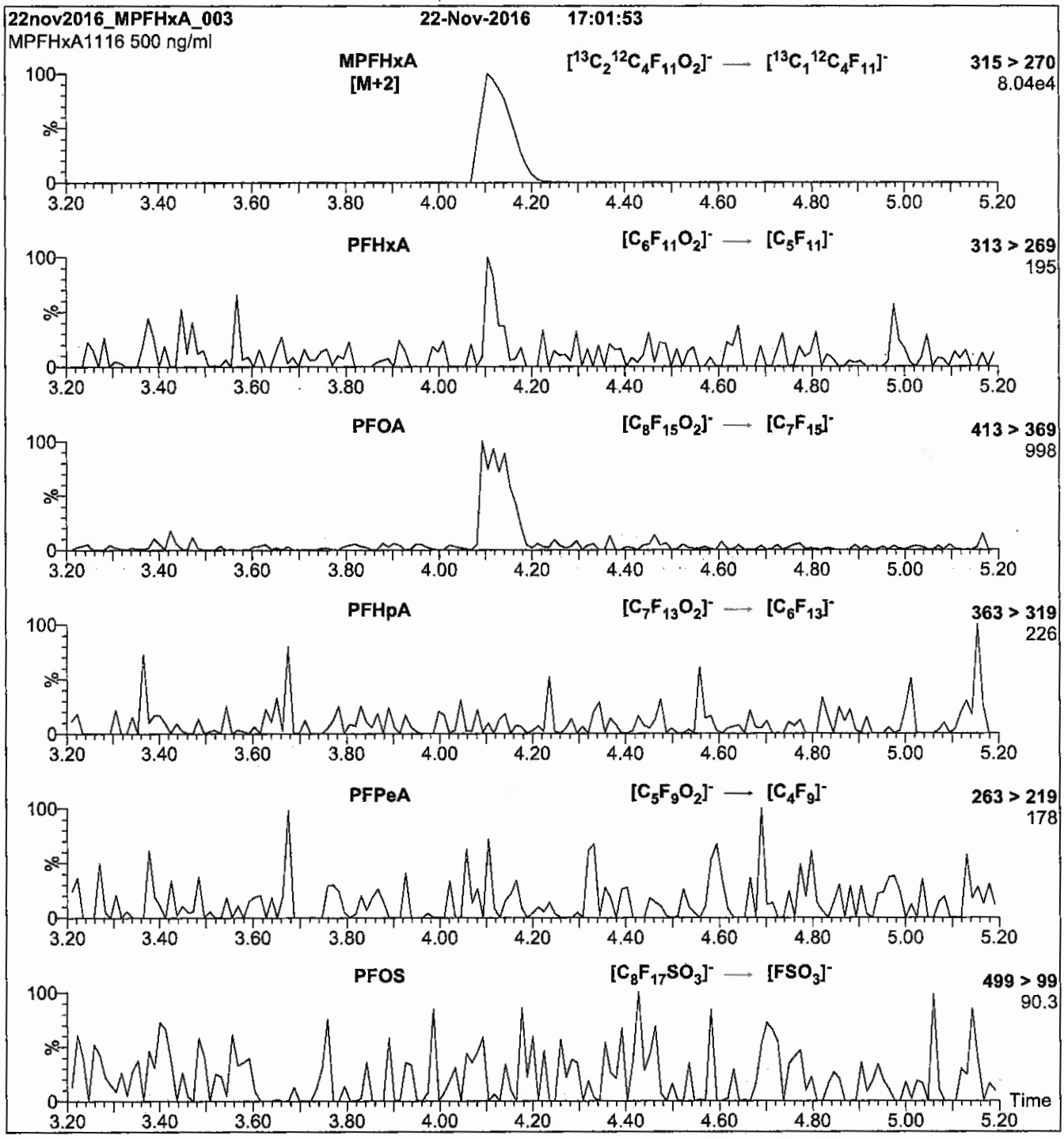
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 10

Reagent

LCMPFOS_00019

R: SBC 12/21/16

814253
ID: LCMPFOS_00019
Exp: 08/03/21 Prpd: SBC
13C4-Perfluorooctanesulfo

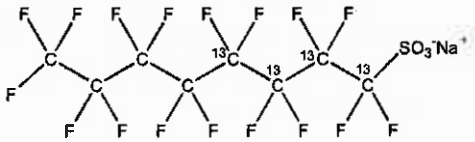
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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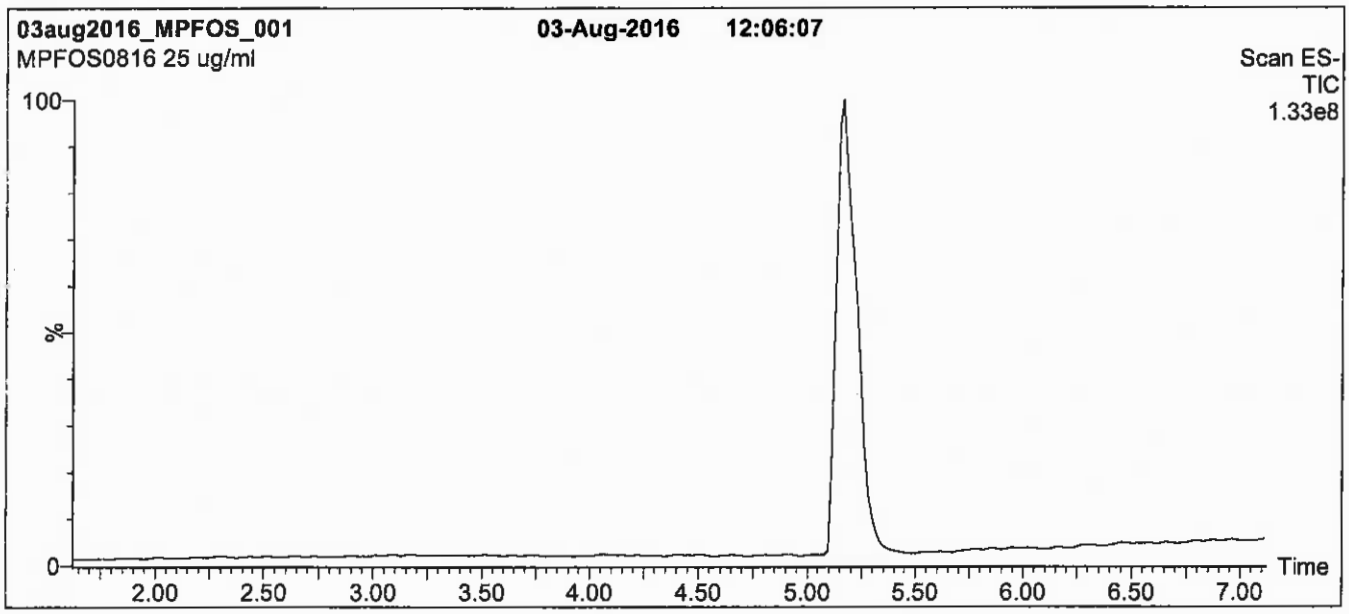
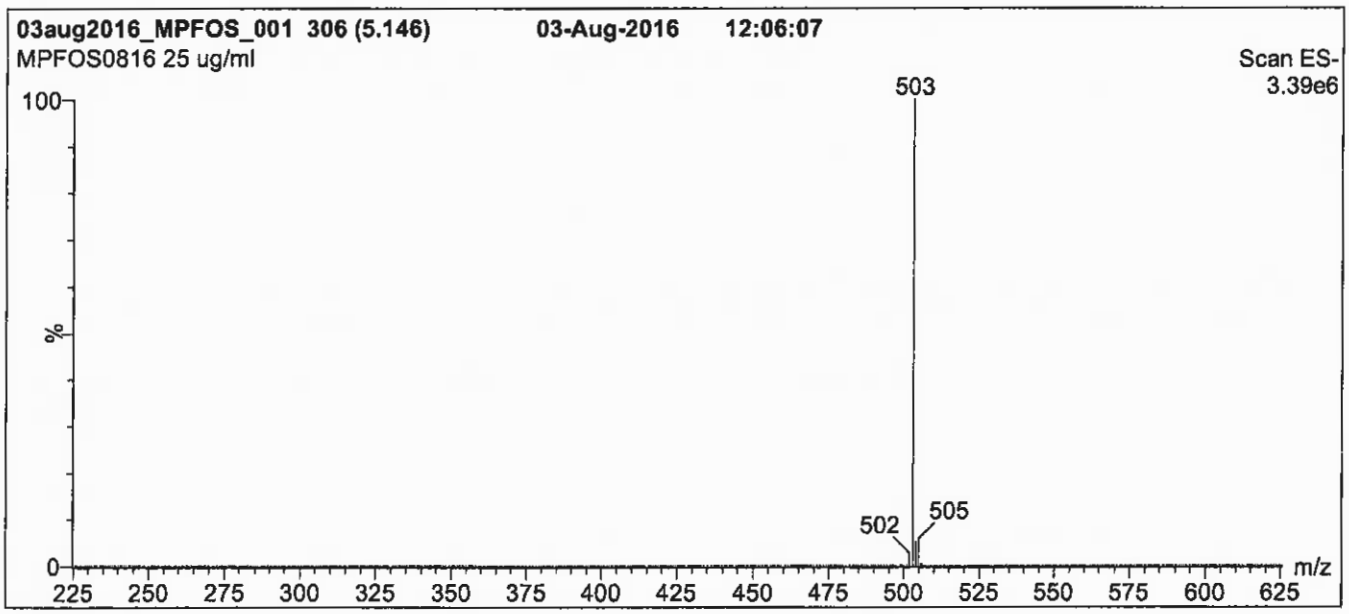




Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

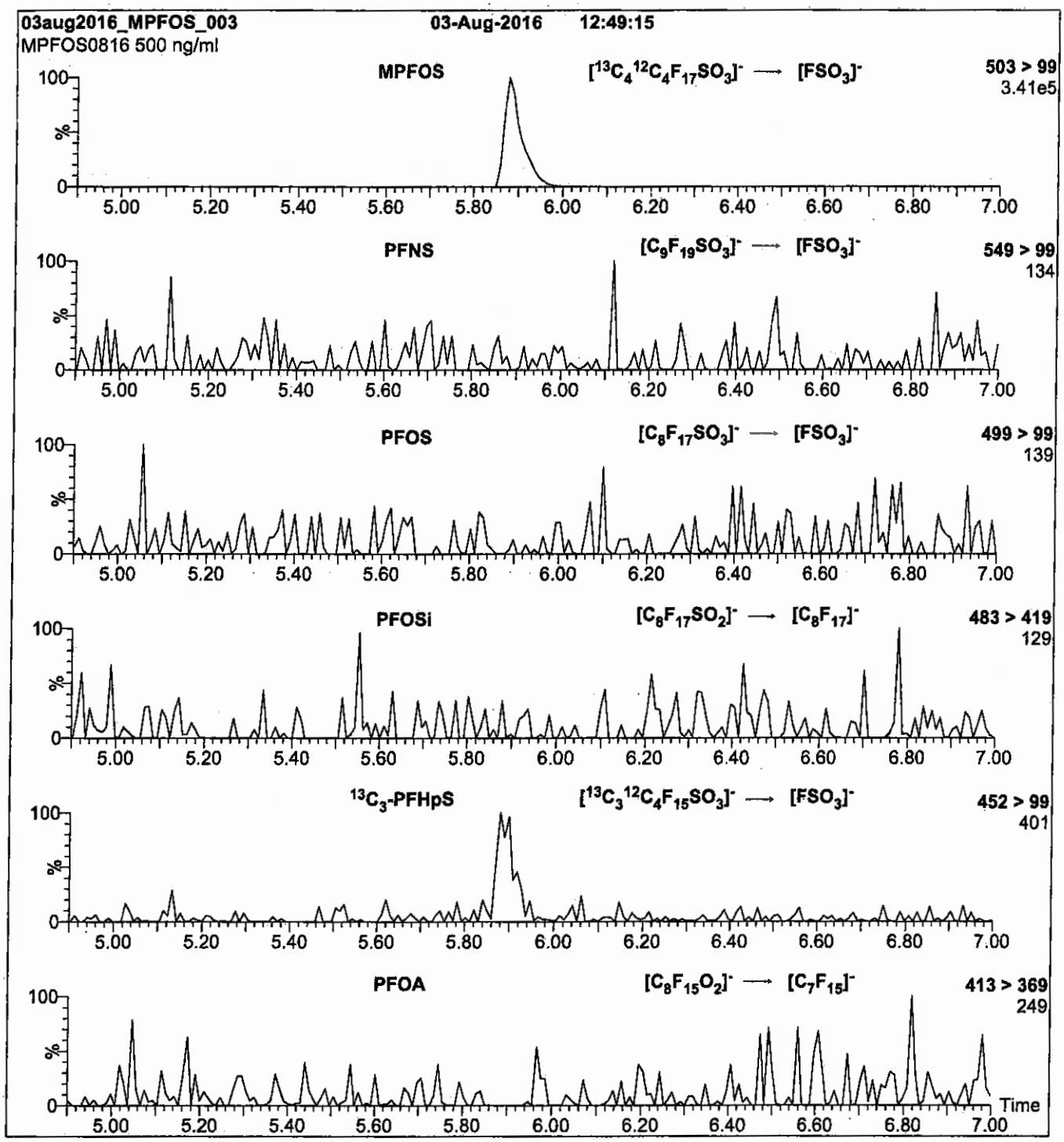
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
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 µl/min

MS Parameters

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

Reagent

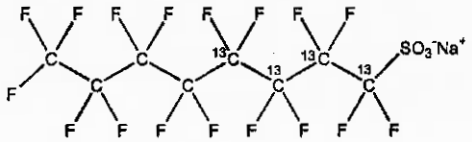
LCMPFOS_00021

r: 5/8/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFOS	**LOT NUMBER:**	MPFOS1216
COMPOUND:	Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate		
STRUCTURE:		**CAS #:**	Not available



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CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4\text{-}^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	12/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	12/12/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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Certified By: B.G. Chittim **Date:** 12/14/2016 (mm/dd/yyyy)

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CALA

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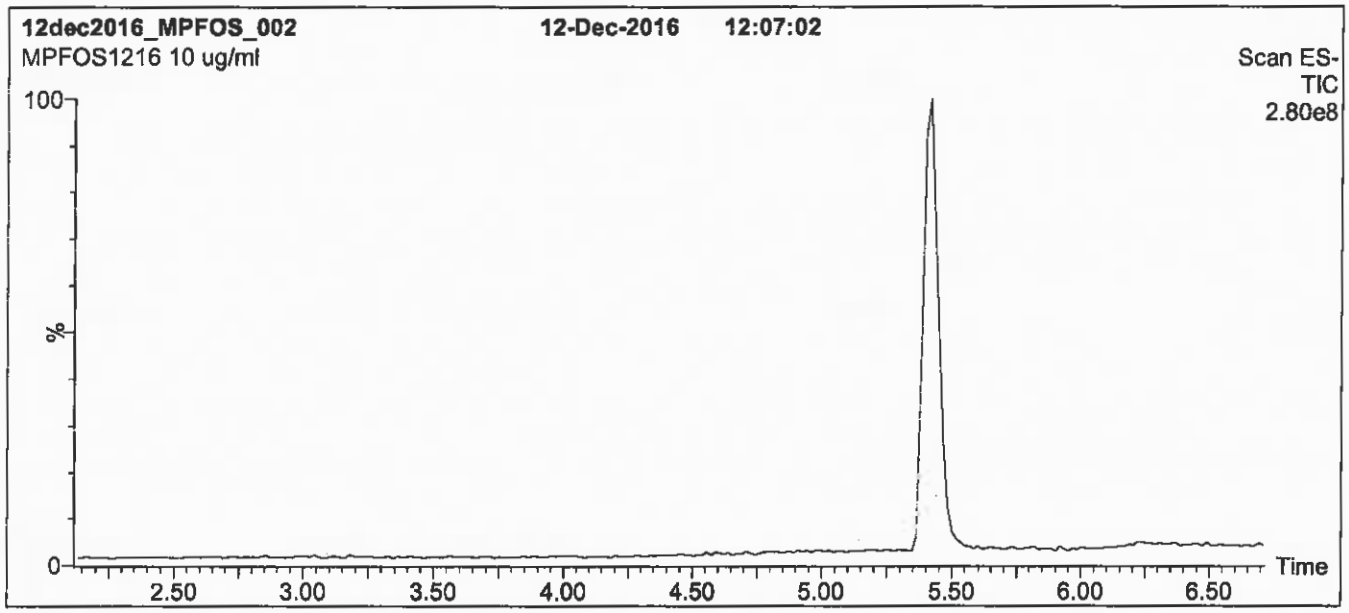

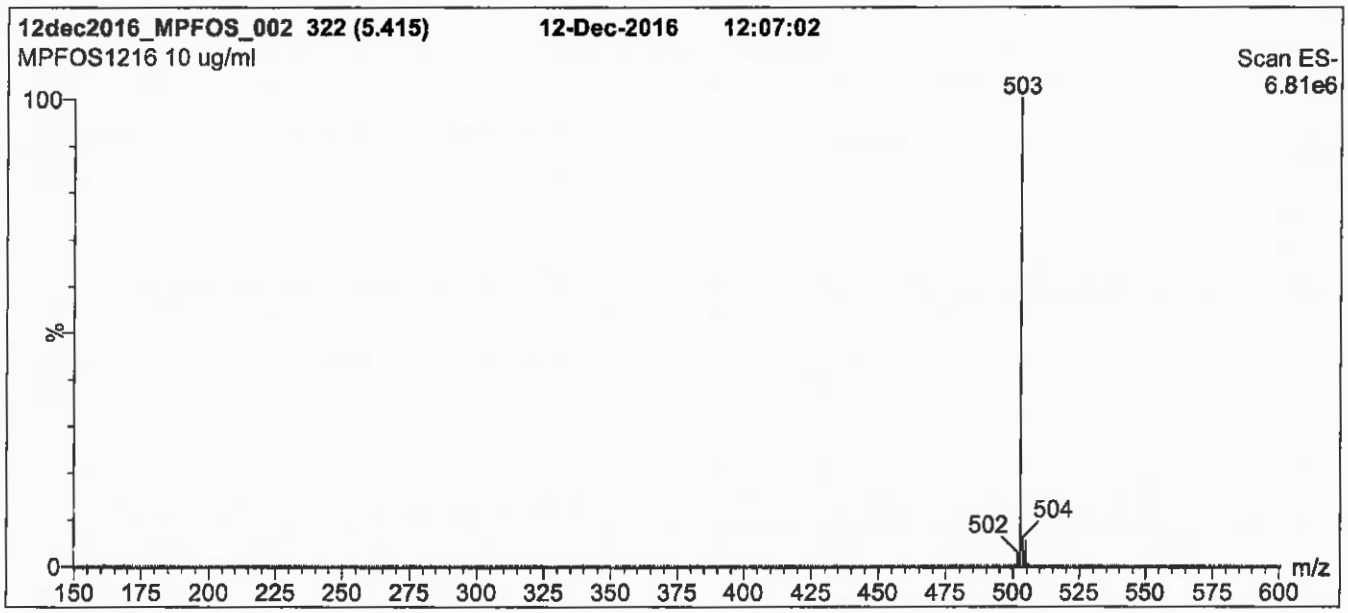

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MS: **Micromass Quattro *micro* API MS**

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1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

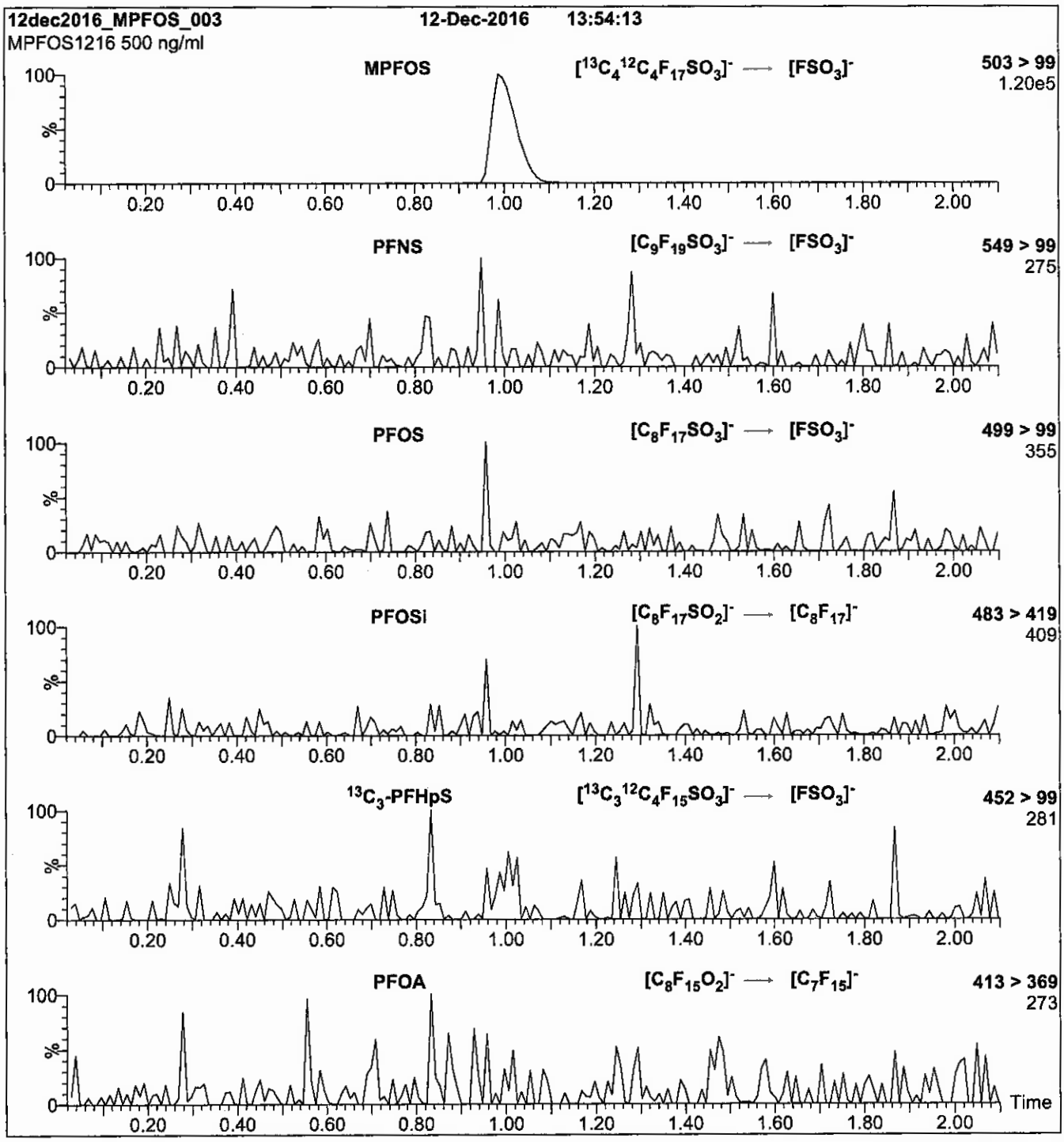
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 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 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-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.: 320-33018-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-110217-RW-286	320-33018-1	84	79
NAWC-110217-FRB-286	320-33018-2	84	85
WGNA-110217-RW-3978	320-33018-3	78	85
WGNA-110217-FRB-3978	320-33018-4	82	88
NAWC-110217-RW-177-IRR	320-33018-5	60 Q	88
NAWC-110217-FRB-177-IRR	320-33018-6	87	89
NAWC-110217-RW-177-SHOP	320-33018-7	48 Q	84
NAWC-110217-FRB-177-SHOP	320-33018-8	84	87
NAWC-110217-RW-185	320-33018-9	77	82
NAWC-110217-FRB-185	320-33018-10	87	88
NAWC-110217-RW-355	320-33018-11	77	82
NAWC-110217-FRB-355	320-33018-12	89	82
NAWC-110217-RW-348	320-33018-13	82	83
NAWC-110217-FRB-348	320-33018-14	90	88
WGNA-110217-RW-3882	320-33018-15	83	84
WGNA-110217-FRB-3882	320-33018-16	85	86
	MB 320-193512/1-A	85	91
	LCS 320-193512/2-A	89	87
	LCSD 320-193512/3-A	87	87

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

Column to be used to flag recovery values

FORM II 537

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.11.13_537A_008.d

Lab ID: LCS 320-193512/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	222	210	95	70-130	M
Perfluorooctanoic acid (PFOA)	111	105	94	70-130	
Perfluorononanoic acid (PFNA)	111	103	93	70-130	
Perfluorohexanesulfonic acid (PFHxS)	167	165	99	70-130	
Perfluoroheptanoic acid (PFHpA)	55.6	51.7	93	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	473	95	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.11.13_537A_009.d

Lab ID: LCSD 320-193512/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	222	215	97	2	30	70-130	M
Perfluorooctanoic acid (PFOA)	111	103	93	2	30	70-130	
Perfluorononanoic acid (PFNA)	111	106	95	2	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	167	169	102	3	30	70-130	
Perfluoroheptanoic acid (PFHpA)	55.6	52.2	94	1	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	480	96	1	30	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Lab File ID: 2017.11.13_537A_007.d Lab Sample ID: MB 320-193512/1-A

Matrix: Water Date Extracted: 11/08/2017 11:47

Instrument ID: A8_N Date Analyzed: 11/13/2017 02:51

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-193512/2-A	2017.11.13_537A_008.d	11/13/2017 02:55
	LCSD 320-193512/3-A	2017.11.13_537A_009.d	11/13/2017 03:00
NAWC-110217-RW-286	320-33018-1	2017.11.13_537A_010.d	11/13/2017 03:05
NAWC-110217-FRB-286	320-33018-2	2017.11.13_537A_011.d	11/13/2017 03:09
WGNA-110217-RW-3978	320-33018-3	2017.11.13_537A_012.d	11/13/2017 03:14
WGNA-110217-FRB-3978	320-33018-4	2017.11.13_537A_013.d	11/13/2017 03:19
NAWC-110217-RW-177-IRR	320-33018-5	2017.11.13_537A_014.d	11/13/2017 03:24
NAWC-110217-FRB-177-IRR	320-33018-6	2017.11.13_537A_015.d	11/13/2017 03:28
NAWC-110217-RW-177-SHOP	320-33018-7	2017.11.13_537A_016.d	11/13/2017 03:33
NAWC-110217-FRB-177-SHOP	320-33018-8	2017.11.13_537A_019.d	11/13/2017 03:47
NAWC-110217-RW-185	320-33018-9	2017.11.13_537A_020.d	11/13/2017 03:52
NAWC-110217-FRB-185	320-33018-10	2017.11.13_537A_021.d	11/13/2017 03:56
NAWC-110217-RW-355	320-33018-11	2017.11.13_537A_022.d	11/13/2017 04:01
NAWC-110217-FRB-355	320-33018-12	2017.11.13_537A_023.d	11/13/2017 04:06
NAWC-110217-RW-348	320-33018-13	2017.11.13_537A_024.d	11/13/2017 04:10
NAWC-110217-FRB-348	320-33018-14	2017.11.13_537A_025.d	11/13/2017 04:15
WGNA-110217-RW-3882	320-33018-15	2017.11.13_537A_026.d	11/13/2017 04:20
WGNA-110217-FRB-3882	320-33018-16	2017.11.13_537A_027.d	11/13/2017 04:24

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Instrument ID: A8_N Calibration Start Date: 11/03/2017 13:37

GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 11/03/2017 14:01

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		1535518	1.91	3276559	2.15		
UPPER LIMIT		2303277	2.41	4914839	2.65		
LOWER LIMIT		767759	1.41	1638280	1.65		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-192908/11		1586829	1.91	3305852	2.15		
ICV 320-192908/13		1512045	1.90	3433628	2.14		
CCVL 320-194241/1		1563386	1.89	3212610	2.13		
CCV 320-194241/2 CCVIS		1499119	1.89	3081036	2.13		
MB 320-193512/1-A		1594024	1.90	3183489	2.13		
LCS 320-193512/2-A		1604626	1.89	3166909	2.12		
LCSD 320-193512/3-A		1626963	1.89	3122845	2.12		
320-33018-1	NAWC-110217-RW-286	1610416	1.89	3118882	2.12		
320-33018-2	NAWC-110217-FRB-286	1634964	1.90	3244030	2.13		
320-33018-3	WGNA-110217-RW-3978	1726982	1.89	3118921	2.12		
320-33018-4	WGNA-110217-FRB-3978	1720859	1.89	3245665	2.12		
320-33018-5	NAWC-110217-RW-177-IRR	1959199	1.88	4022877	2.12		
320-33018-6	NAWC-110217-FRB-177-IRR	1618805	1.88	3182899	2.12		
320-33018-7	NAWC-110217-RW-177-SHOP	1661894	1.88	3172392	2.12		
CCV 320-194241/14 CCVIS		1520572	1.89	3195765	2.12		
CCV 320-194251/14 CCVIS		1520572	1.89	3195765	2.12		
320-33018-8	NAWC-110217-FRB-177-SHOP	1645574	1.89	3338627	2.12		
320-33018-9	NAWC-110217-RW-185	1750127	1.88	3418133	2.12		
320-33018-10	NAWC-110217-FRB-185	1656481	1.88	3242885	2.12		
320-33018-11	NAWC-110217-RW-355	1745240	1.89	3289792	2.12		
320-33018-12	NAWC-110217-FRB-355	1590556	1.89	3142325	2.12		
320-33018-13	NAWC-110217-RW-348	1771725	1.88	3280139	2.12		
320-33018-14	NAWC-110217-FRB-348	1622165	1.89	3163206	2.12		
320-33018-15	WGNA-110217-RW-3882	1670566	1.88	3261923	2.12		
320-33018-16	WGNA-110217-FRB-3882	1680590	1.88	3129778	2.12		
CCV 320-194251/25 CCVIS		1546685	1.88	3175276	2.12		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Sample No.: CCV 320-194241/2 Date Analyzed: 11/13/2017 02:41

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2017.11.13_537A_005 Heated Purge: (Y/N) N

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1499119	1.89	3081036	2.13		
UPPER LIMIT		2098767	2.39	4313450	2.63		
LOWER LIMIT		1049383	1.39	2156725	1.63		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-193512/1-A		1594024	1.90	3183489	2.13		
LCS 320-193512/2-A		1604626	1.89	3166909	2.12		
LCSD 320-193512/3-A		1626963	1.89	3122845	2.12		
320-33018-1	NAWC-110217-RW-286	1610416	1.89	3118882	2.12		
320-33018-2	NAWC-110217-FRB-286	1634964	1.90	3244030	2.13		
320-33018-3	WGNA-110217-RW-3978	1726982	1.89	3118921	2.12		
320-33018-4	WGNA-110217-FRB-3978	1720859	1.89	3245665	2.12		
320-33018-5	NAWC-110217-RW-177-IRR	1959199	1.88	4022877	2.12		
320-33018-6	NAWC-110217-FRB-177-IRR	1618805	1.88	3182899	2.12		
320-33018-7	NAWC-110217-RW-177-SHOP	1661894	1.88	3172392	2.12		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Sample No.: CCV 320-194241/14 Date Analyzed: 11/13/2017 03:38

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2017.11.13_537A_017 Heated Purge: (Y/N) N

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1520572	1.89	3195765	2.12		
UPPER LIMIT		2128801	2.39	4474071	2.62		
LOWER LIMIT		1064400	1.39	2237036	1.62		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-193512/1-A		1594024	1.90	3183489	2.13		
LCS 320-193512/2-A		1604626	1.89	3166909	2.12		
LCSD 320-193512/3-A		1626963	1.89	3122845	2.12		
320-33018-1	NAWC-110217-RW-286	1610416	1.89	3118882	2.12		
320-33018-2	NAWC-110217-FRB-286	1634964	1.90	3244030	2.13		
320-33018-3	WGNA-110217-RW-3978	1726982	1.89	3118921	2.12		
320-33018-4	WGNA-110217-FRB-3978	1720859	1.89	3245665	2.12		
320-33018-5	NAWC-110217-RW-177-IRR	1959199	1.88	4022877	2.12		
320-33018-6	NAWC-110217-FRB-177-IRR	1618805	1.88	3182899	2.12		
320-33018-7	NAWC-110217-RW-177-SHOP	1661894	1.88	3172392	2.12		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Sample No.: CCV 320-194251/14 Date Analyzed: 11/13/2017 03:38

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2017.11.13_537A_017 Heated Purge: (Y/N) N

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1520572	1.89	3195765	2.12		
UPPER LIMIT		2128801	2.39	4474071	2.62		
LOWER LIMIT		1064400	1.39	2237036	1.62		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-33018-8	NAWC-110217-FRB-177-SHOP	1645574	1.89	3338627	2.12		
320-33018-9	NAWC-110217-RW-185	1750127	1.88	3418133	2.12		
320-33018-10	NAWC-110217-FRB-185	1656481	1.88	3242885	2.12		
320-33018-11	NAWC-110217-RW-355	1745240	1.89	3289792	2.12		
320-33018-12	NAWC-110217-FRB-355	1590556	1.89	3142325	2.12		
320-33018-13	NAWC-110217-RW-348	1771725	1.88	3280139	2.12		
320-33018-14	NAWC-110217-FRB-348	1622165	1.89	3163206	2.12		
320-33018-15	WGNA-110217-RW-3882	1670566	1.88	3261923	2.12		
320-33018-16	WGNA-110217-FRB-3882	1680590	1.88	3129778	2.12		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Sample No.: CCV 320-194251/25 Date Analyzed: 11/13/2017 04:29

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2017.11.13_537A_028 Heated Purge: (Y/N) N

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1546685	1.88	3175276	2.12		
UPPER LIMIT		2165359	2.38	4445386	2.62		
LOWER LIMIT		1082680	1.38	2222693	1.62		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-33018-8	NAWC-110217-FRB-177-SHOP	1645574	1.89	3338627	2.12		
320-33018-9	NAWC-110217-RW-185	1750127	1.88	3418133	2.12		
320-33018-10	NAWC-110217-FRB-185	1656481	1.88	3242885	2.12		
320-33018-11	NAWC-110217-RW-355	1745240	1.89	3289792	2.12		
320-33018-12	NAWC-110217-FRB-355	1590556	1.89	3142325	2.12		
320-33018-13	NAWC-110217-RW-348	1771725	1.88	3280139	2.12		
320-33018-14	NAWC-110217-FRB-348	1622165	1.89	3163206	2.12		
320-33018-15	WGNA-110217-RW-3882	1670566	1.88	3261923	2.12		
320-33018-16	WGNA-110217-FRB-3882	1680590	1.88	3129778	2.12		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-286 | Lab Sample ID: 320-33018-1

Matrix: Water | Lab File ID: 2017.11.13_537A_010.d

Analysis Method: 537 | Date Collected: 11/02/2017 08:10

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 242.3(mL) | Date Analyzed: 11/13/2017 03:05

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J M	41	17	7.0
335-67-1	Perfluorooctanoic acid (PFOA)	16	J	21	8.3	2.9
375-95-1	Perfluorononanoic acid (PFNA)	21	U M	25	21	8.3
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.5	J	31	12	5.7
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	J	10	4.1	2.0
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	93	37	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	84		70-130
STL00996	13C2 PFDA	79		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_010.d
Lims ID: 320-33018-A-1-A
Client ID: NAWC-110217-RW-286
Sample Type: Client
Inject. Date: 13-Nov-2017 03:05:17 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-1-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 16:55:43

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.434	1.444	-0.010	1.000	224429	1.85		96.5	
298.90 > 99.00	1.434	1.444	-0.010	1.000	152439		1.47(0.00-0.00)	353	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1482089	8.36		5317	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.707	1.725	-0.018	1.000	287773	1.58		150	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.707	1.725	-0.018	1.000	143355	0.9501		28.1	
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.913	-0.024		1610416	10.0		5738	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.889	1.914	-0.025	1.000	574831	3.86		82.9	
413.00 > 169.00	1.889	1.914	-0.025	1.000	315594		1.82(0.00-0.00)	269	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.132	2.117	0.015	1.000	525050	5.14		243	M
499.00 > 99.00	2.124	2.117	0.007	0.996	90288		5.82(0.00-0.00)	148	M
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.151	-0.027		3118882	28.7		2991	
9 Perfluorononanoic acid									M
463.00 > 419.00	2.140	2.158	-0.018	1.000	50353	0.4708		12.6	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.299	2.312	-0.013	1.000	976506	7.92		5919	

QC Flag Legend

Review Flags

M - Manually Integrated

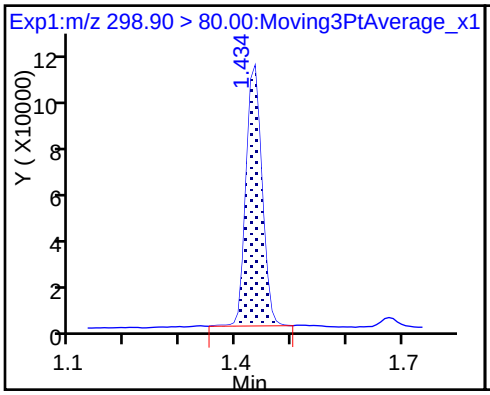
Report Date: 14-Nov-2017 17:12:02 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

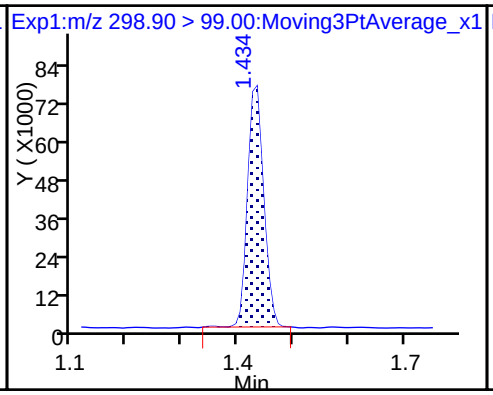
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_010.d

Injection Date:	13-Nov-2017 03:05:17	Instrument ID:	A8_N
Lims ID:	320-33018-A-1-A	Lab Sample ID:	320-33018-1
Client ID:	NAWC-110217-RW-286		
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4 Worklist Smp#: 7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000
Method:	537_A8_N	Limit Group:	LC 537 ICAL

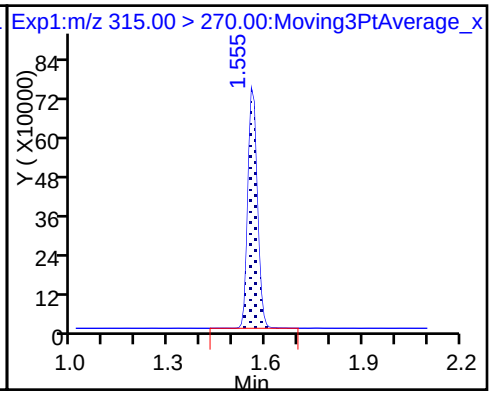
1 Perfluorobutanesulfonic acid



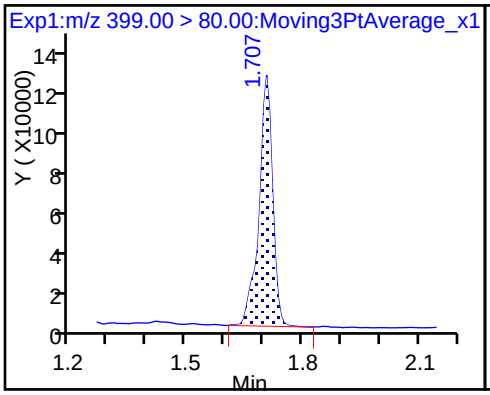
1 Perfluorobutanesulfonic acid



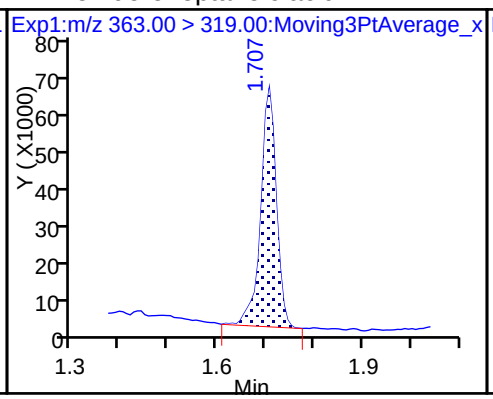
$ 2 13C2 PFHxA



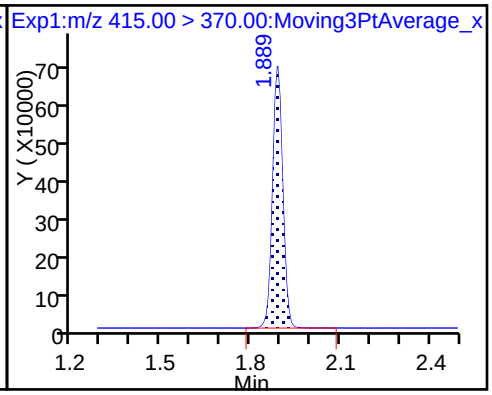
3 Perfluorohexanesulfonic acid



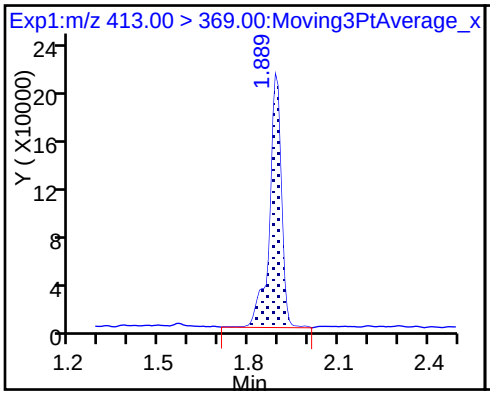
4 Perfluoroheptanoic acid



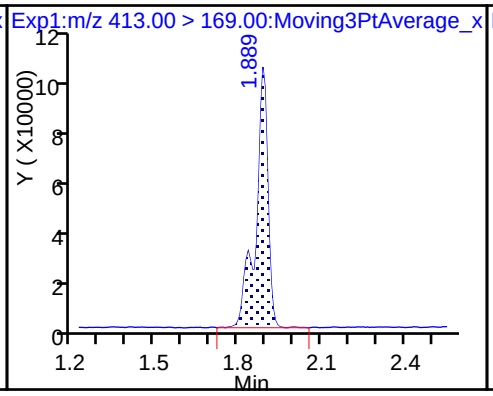
* 6 13C2-PFOA



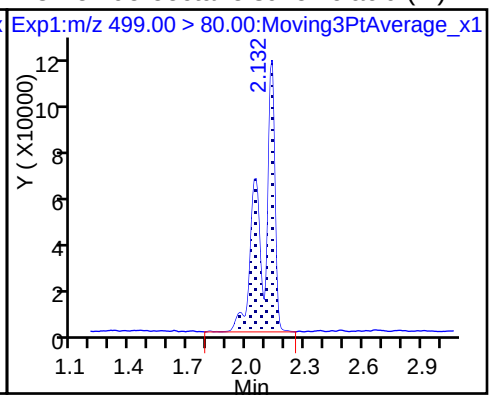
5 Perfluorooctanoic acid



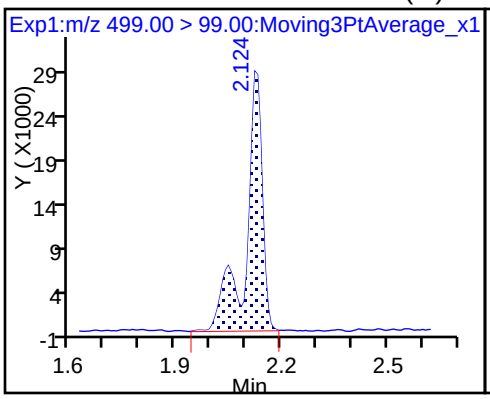
5 Perfluorooctanoic acid



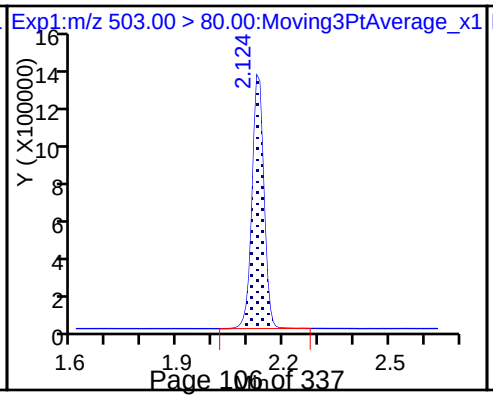
8 Perfluorooctane sulfonic acid (M)



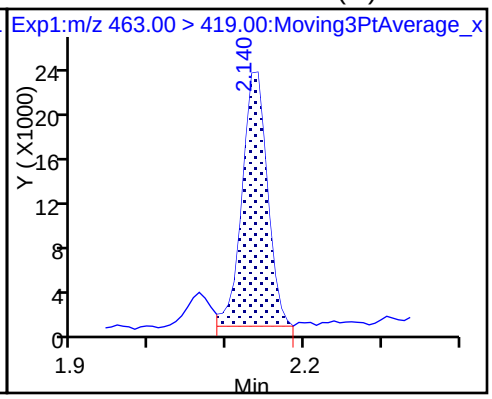
8 Perfluorooctane sulfonic acid (M)



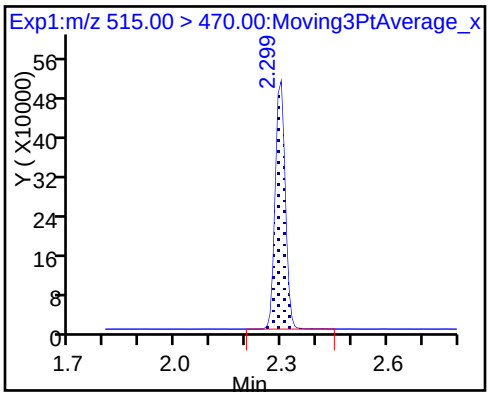
* 7 13C4 PFOS



9 Perfluorononanoic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.299
Y (X10000)
56
48
40
32
24
16
8
0
1.7
2.0
2.3
2.6
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_010.d				
Lims ID:	320-33018-A-1-A				
Client ID:	NAWC-110217-RW-286				
Sample Type:	Client				
Inject. Date:	13-Nov-2017 03:05:17	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-33018-a-1-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	14-Nov-2017 17:11:56	Calib Date:	03-Nov-2017 14:01:24		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK010				
First Level Reviewer: barnettj		Date:	14-Nov-2017 16:55:43		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.36	83.64
$ 10 13C2 PFDA	10.0	7.92	79.24

TestAmerica Sacramento

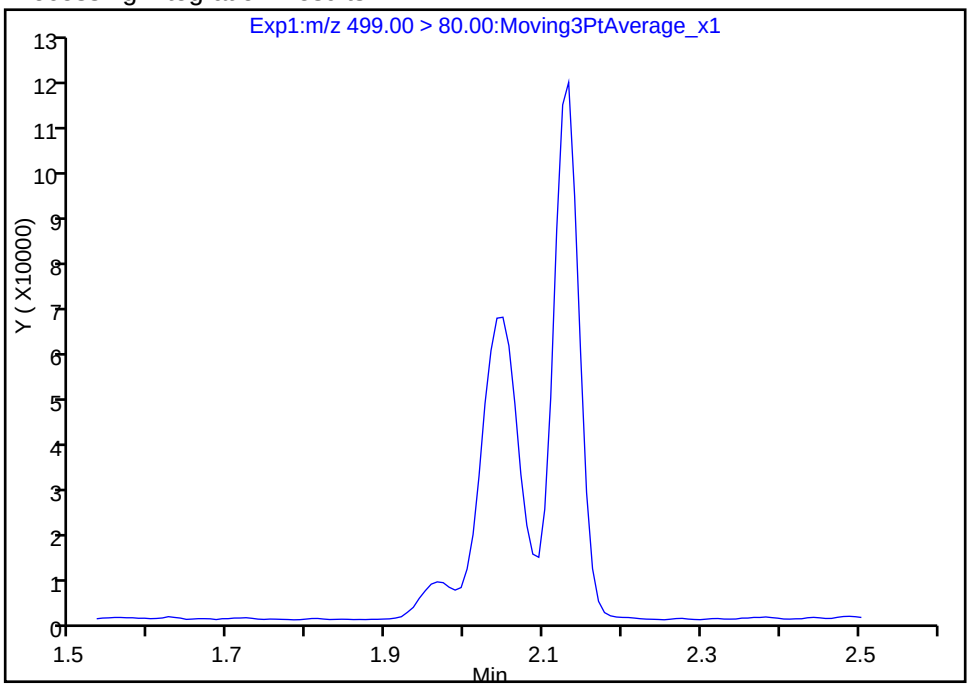
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_010.d				
Injection Date:	13-Nov-2017 03:05:17	Instrument ID:	A8_N		
Lims ID:	320-33018-A-1-A	Lab Sample ID:	320-33018-1		
Client ID:	NAWC-110217-RW-286				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

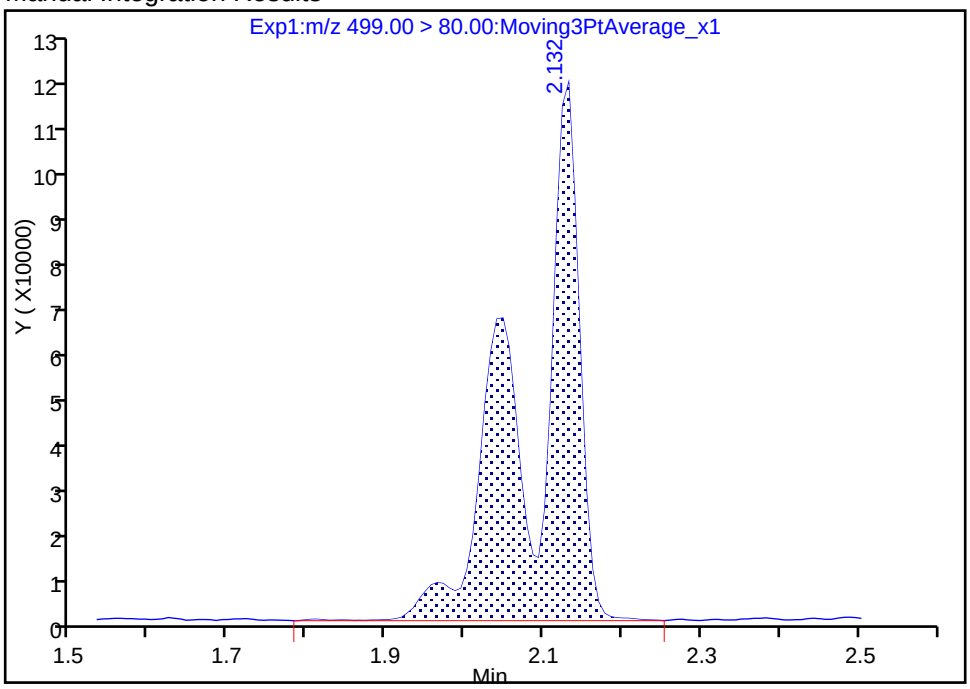
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.13
Area: 525050
Amount: 5.142082
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:55:20
Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

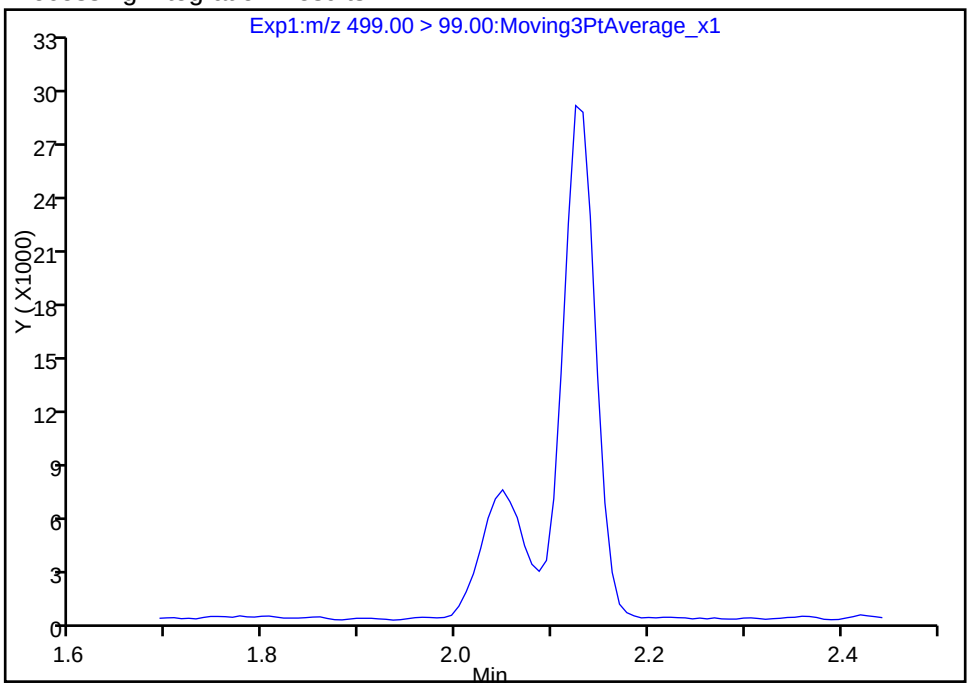
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_010.d				
Injection Date:	13-Nov-2017 03:05:17	Instrument ID:	A8_N		
Lims ID:	320-33018-A-1-A	Lab Sample ID:	320-33018-1		
Client ID:	NAWC-110217-RW-286				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 2

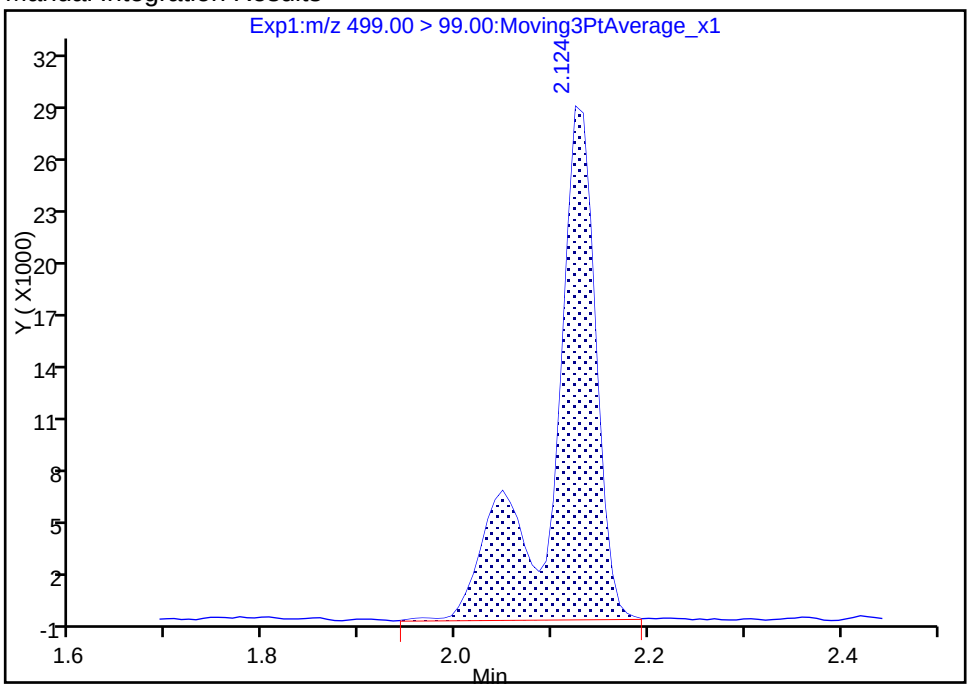
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 90288
Amount: 5.142082
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:55:34
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_010.d

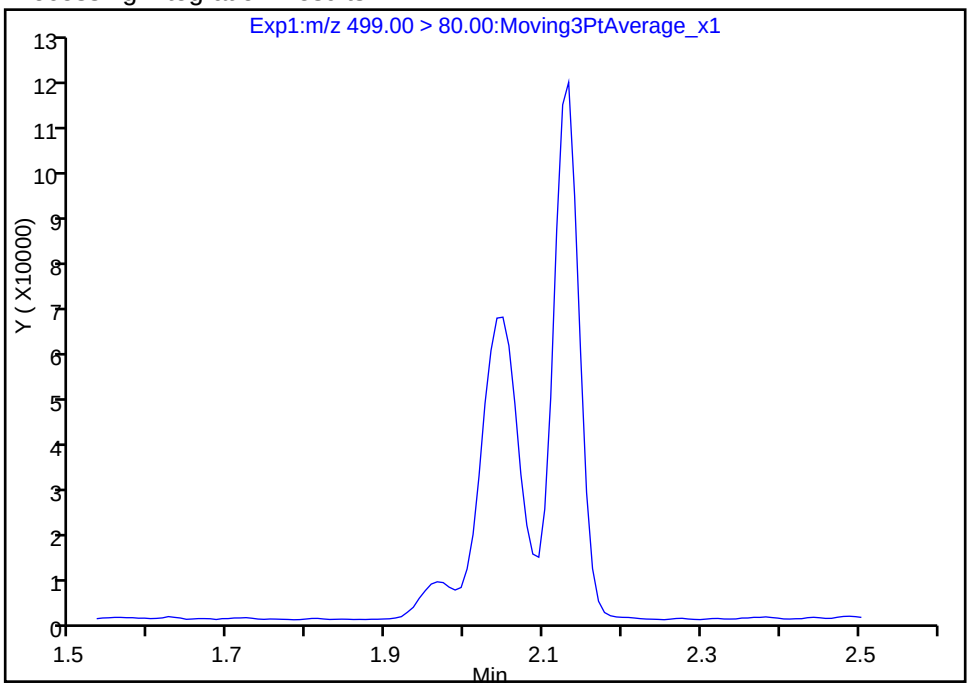
Injection Date:	13-Nov-2017 03:05:17	Instrument ID:	A8_N		
Lims ID:	320-33018-A-1-A	Lab Sample ID:	320-33018-1		
Client ID:	NAWC-110217-RW-286				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

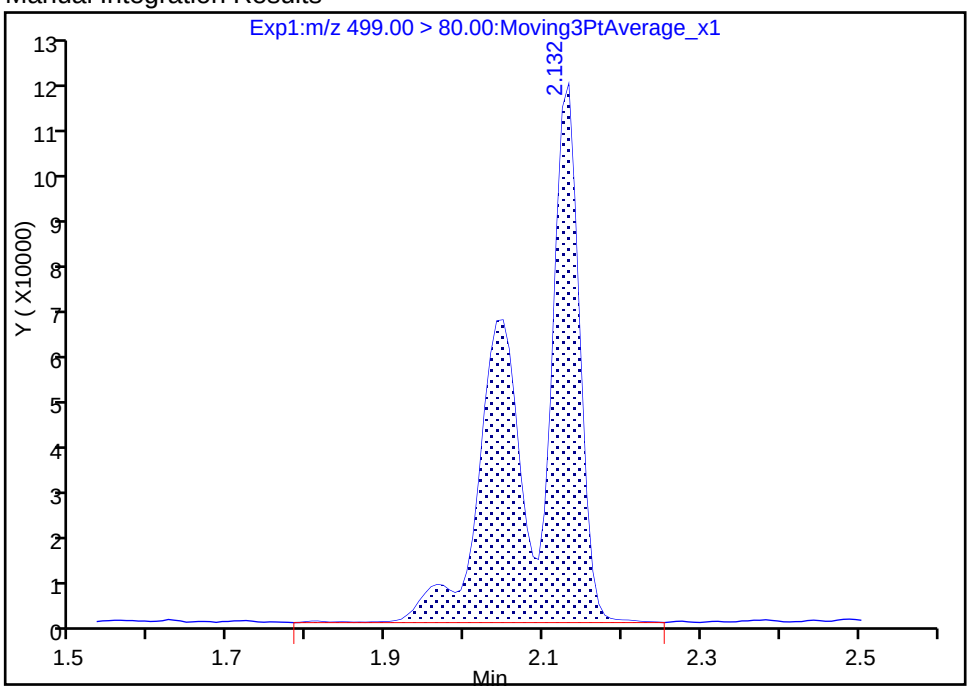
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.13
Area: 525050
Amount: 5.142082
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:55:34
Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento

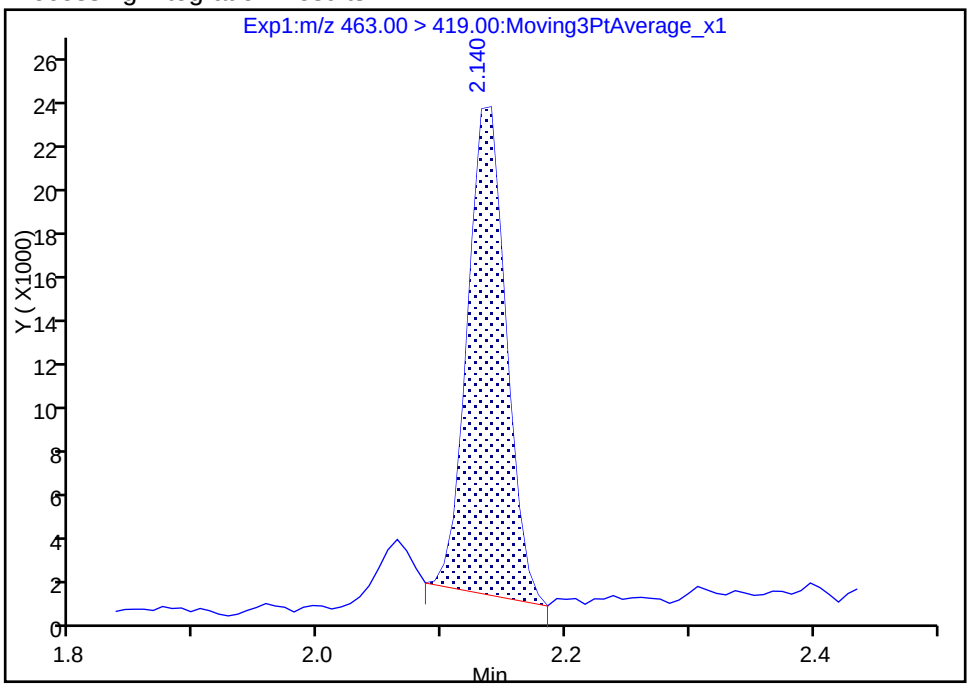
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_010.d				
Injection Date:	13-Nov-2017 03:05:17	Instrument ID:	A8_N		
Lims ID:	320-33018-A-1-A	Lab Sample ID:	320-33018-1		
Client ID:	NAWC-110217-RW-286				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

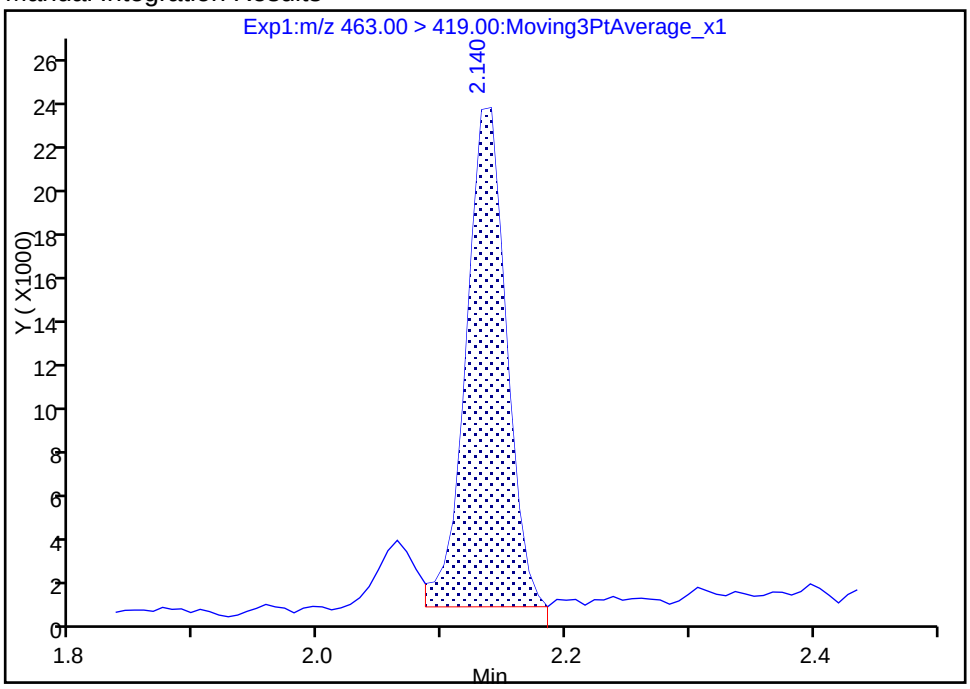
Processing Integration Results

RT: 2.14
Area: 47317
Amount: 0.442391
Amount Units: ng/ml



Manual Integration Results

RT: 2.14
Area: 50353
Amount: 0.470776
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:57:33
Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-286 | Lab Sample ID: 320-33018-2

Matrix: Water | Lab File ID: 2017.11.13_537A_011.d

Analysis Method: 537 | Date Collected: 11/02/2017 08:05

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 243.9(mL) | Date Analyzed: 11/13/2017 03:09

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	7.0
335-67-1	Perfluorooctanoic acid (PFOA)	8.2	U	21	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	21	U	25	21	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	84		70-130
STL00996	13C2 PFDA	85		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_011.d
Lims ID: 320-33018-A-2-A
Client ID: NAWC-110217-FRB-286
Sample Type: Client
Inject. Date: 13-Nov-2017 03:09:57 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-2-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.563	1.573	-0.010	1.000	1504083	8.36		5111	
* 6 13C2-PFOA									
415.00 > 370.00	1.897	1.913	-0.016		1634964	10.0		6506	
* 7 13C4 PFOS									
503.00 > 80.00	2.132	2.151	-0.019		3244030	28.7		4620	
$ 10 13C2 PFDA									
515.00 > 470.00	2.299	2.312	-0.013	1.000	1061674	8.49		6820	

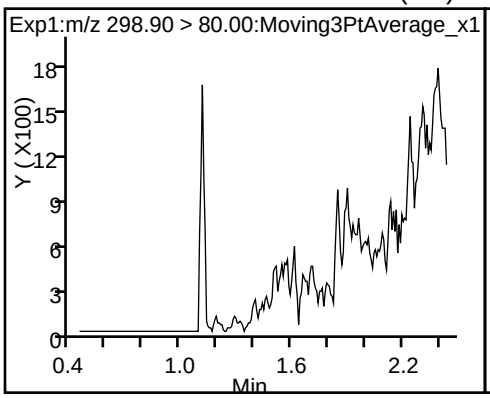
Report Date: 14-Nov-2017 17:12:03 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

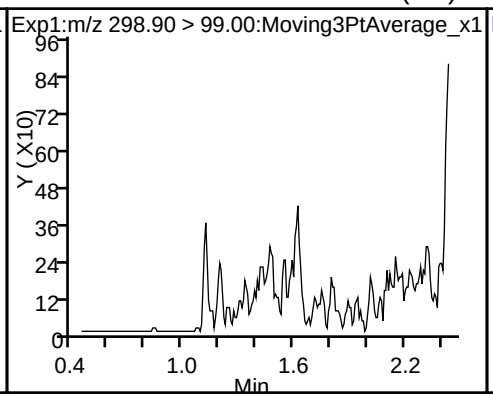
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_011.d

Injection Date:	13-Nov-2017 03:09:57	Instrument ID:	A8_N
Lims ID:	320-33018-A-2-A	Lab Sample ID:	320-33018-2
Client ID:	NAWC-110217-FRB-286		
Operator ID:	SACINSTLCMS01	ALS Bottle#:	5 Worklist Smp#: 8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000
Method:	537_A8_N	Limit Group:	LC 537 ICAL

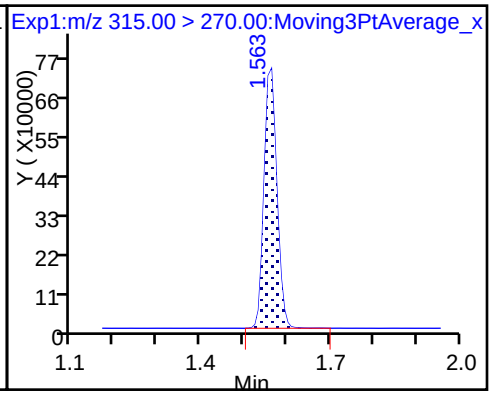
1 Perfluorobutanesulfonic acid (ND)



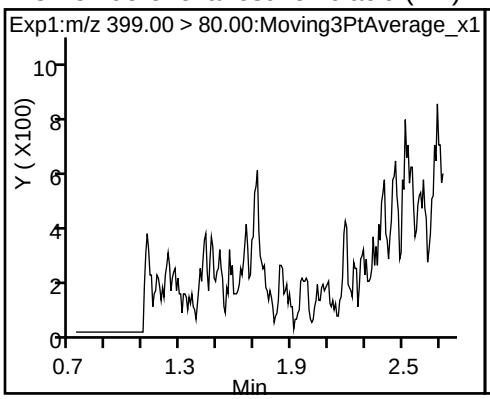
1 Perfluorobutanesulfonic acid (ND)



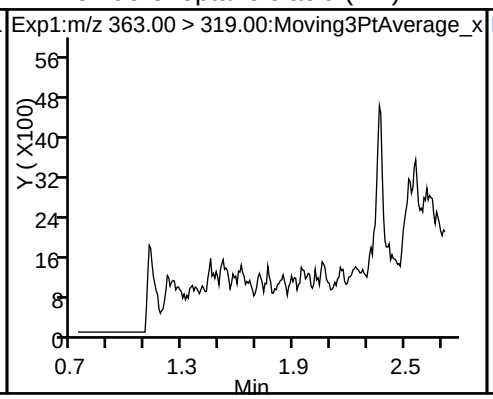
$ 2 13C2 PFHxA



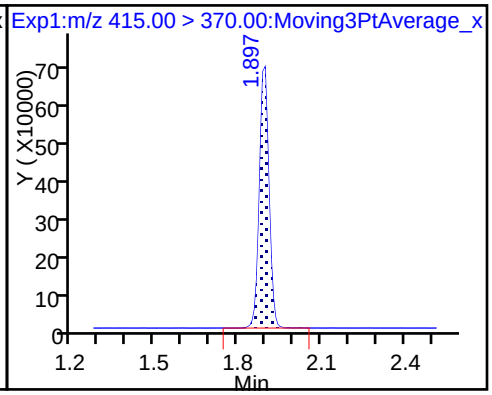
3 Perfluorohexanesulfonic acid (ND)



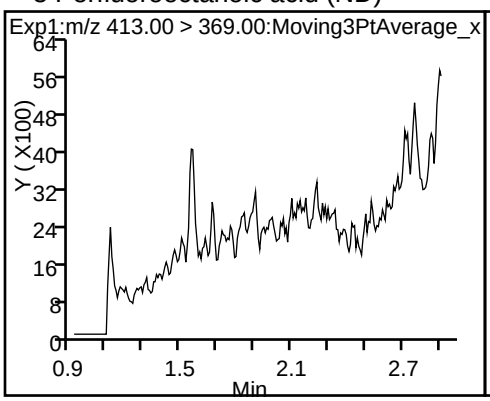
4 Perfluoroheptanoic acid (ND)



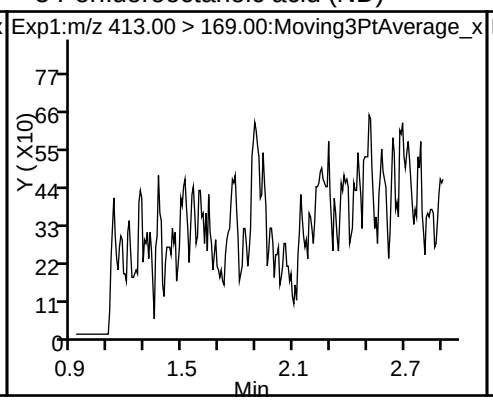
* 6 13C2-PFOA



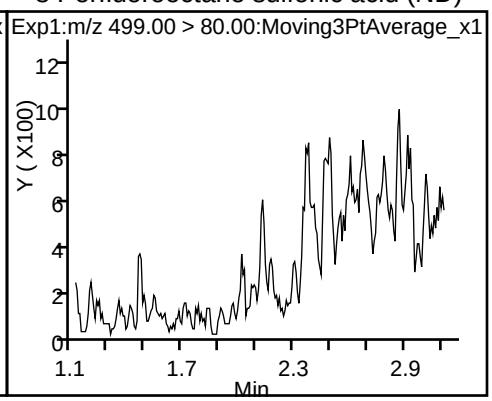
5 Perfluorooctanoic acid (ND)



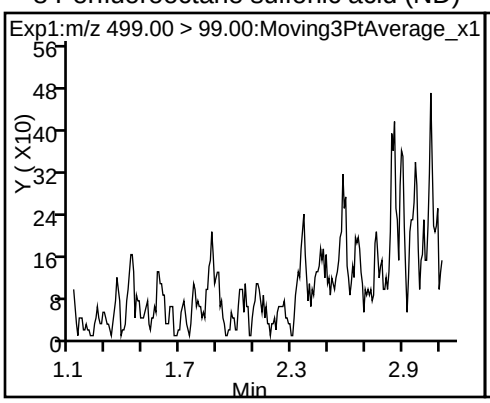
5 Perfluorooctanoic acid (ND)



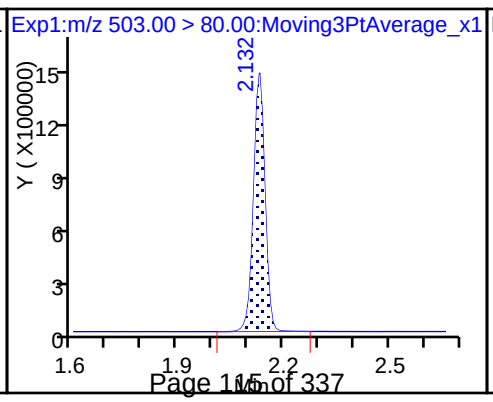
8 Perfluorooctane sulfonic acid (ND)



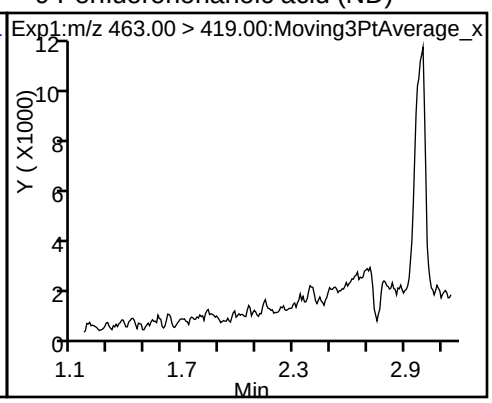
8 Perfluorooctane sulfonic acid (ND)



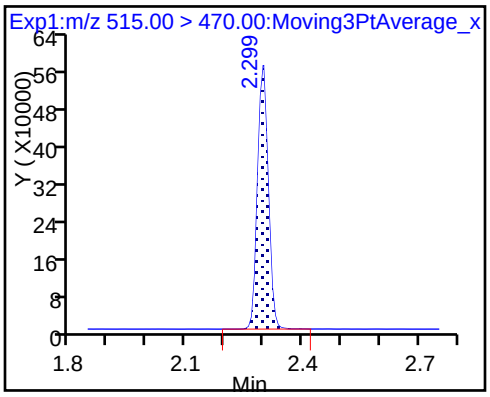
* 7 13C4 PFOS



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.299
Y (X10000)
64
56
48
40
32
24
16
8
0
1.8
2.1
2.4
2.7
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_011.d				
Lims ID:	320-33018-A-2-A				
Client ID:	NAWC-110217-FRB-286				
Sample Type:	Client				
Inject. Date:	13-Nov-2017 03:09:57	ALS Bottle#:	5	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-33018-a-2-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	14-Nov-2017 17:11:56	Calib Date:	03-Nov-2017 14:01:24		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK010				

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.36	83.61
$ 10 13C2 PFDA	10.0	8.49	84.86

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: WGNA-110217-RW-3978 | Lab Sample ID: 320-33018-3

Matrix: Water | Lab File ID: 2017.11.13_537A_012.d

Analysis Method: 537 | Date Collected: 11/02/2017 08:40

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 245.7(mL) | Date Analyzed: 11/13/2017 03:14

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	22	J M	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	14	J	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.3	J	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.5	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	78		70-130
STL00996	13C2 PFDA	85		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_012.d
Lims ID: 320-33018-A-3-A
Client ID: WGNA-110217-RW-3978
Sample Type: Client
Inject. Date: 13-Nov-2017 03:14:37 ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-3-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 16:58:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.434	1.444	-0.010	1.000	166180	1.37		53.0	
298.90 > 99.00	1.434	1.444	-0.010	1.000	116397		1.43(0.00-0.00)	244	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1474273	7.76		5889	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.707	1.725	-0.018	1.000	369143	2.03		128	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.707	1.725	-0.018	1.000	256781	1.59		44.4	
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.913	-0.024		1726982	10.0		6895	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.889	1.914	-0.025	1.000	560271	3.50		71.4	
413.00 > 169.00	1.889	1.914	-0.025	1.000	319492		1.75(0.00-0.00)	302	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.124	2.117	0.007	1.000	557857	5.46		161	M
499.00 > 99.00	2.124	2.117	0.007	1.000	100622		5.54(0.00-0.00)	178	M
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.151	-0.027		3118921	28.7		2092	
9 Perfluorononanoic acid									M
463.00 > 419.00	2.132	2.158	-0.026	1.000	80827	0.7047		16.7	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.312	-0.021	1.000	1126233	8.52		8666	

QC Flag Legend

Review Flags

M - Manually Integrated

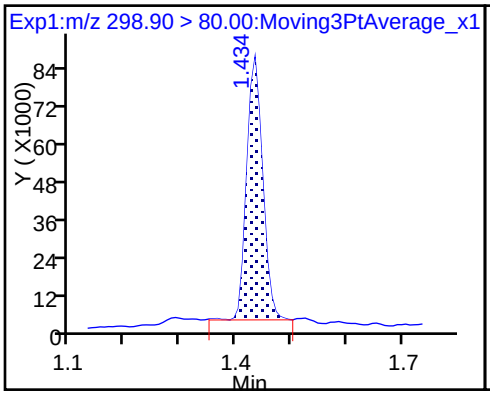
Report Date: 14-Nov-2017 17:12:03 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

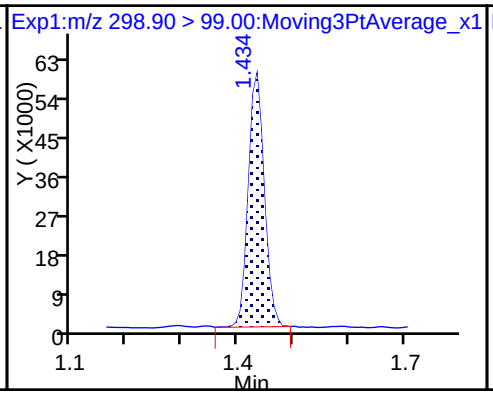
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_012.d

Injection Date:	13-Nov-2017 03:14:37	Instrument ID:	A8_N		
Lims ID:	320-33018-A-3-A	Lab Sample ID:	320-33018-3		
Client ID:	WGNA-110217-RW-3978				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

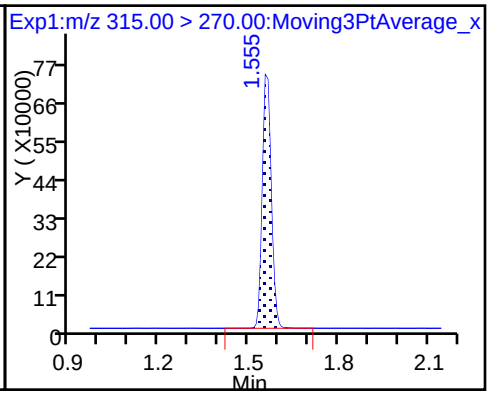
1 Perfluorobutanesulfonic acid



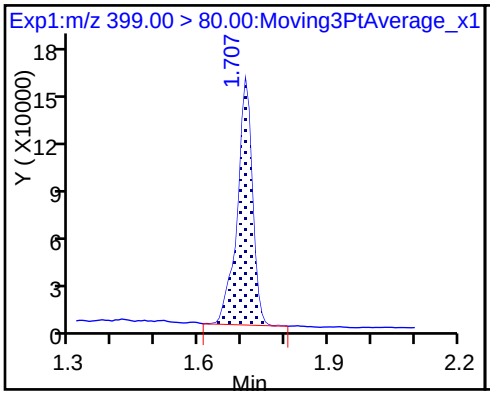
1 Perfluorobutanesulfonic acid



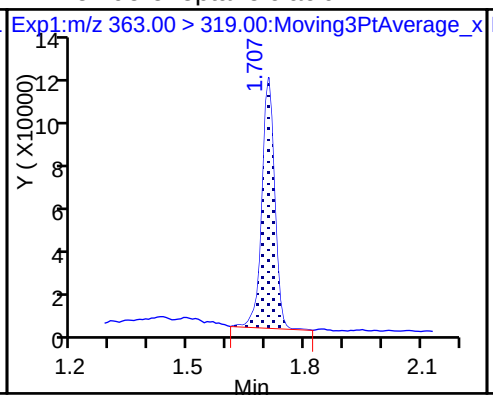
$ 2 13C2 PFHxA



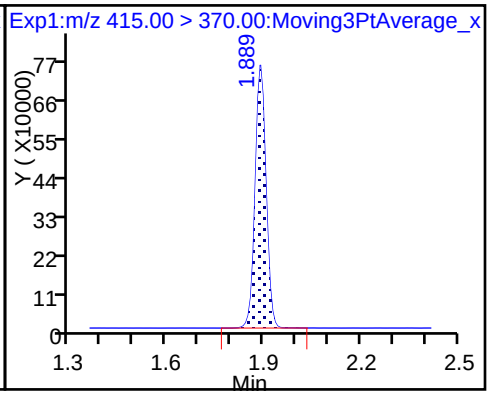
3 Perfluorohexanesulfonic acid



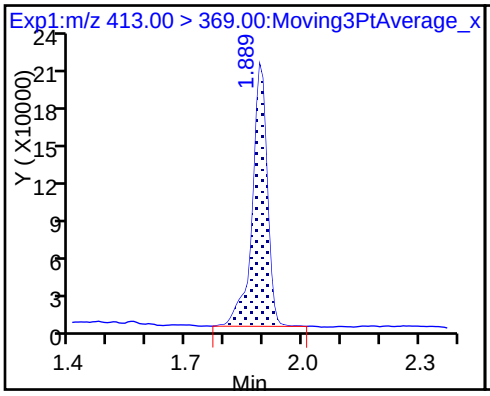
4 Perfluoroheptanoic acid



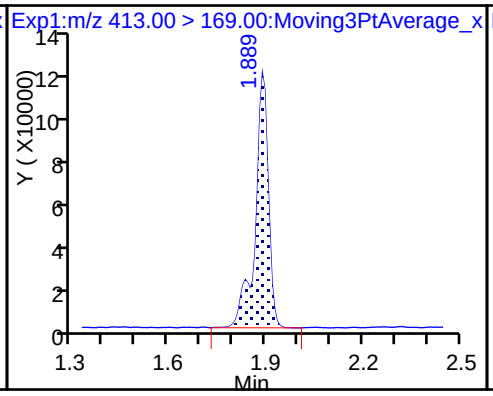
* 6 13C2-PFOA



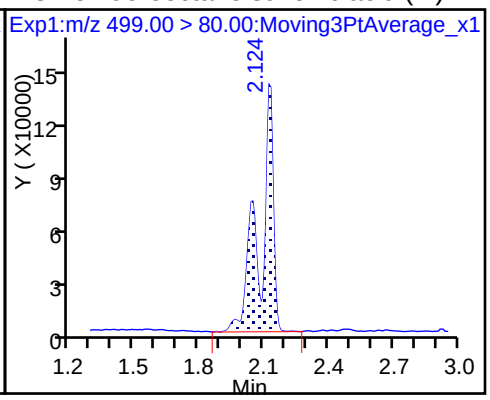
5 Perfluorooctanoic acid



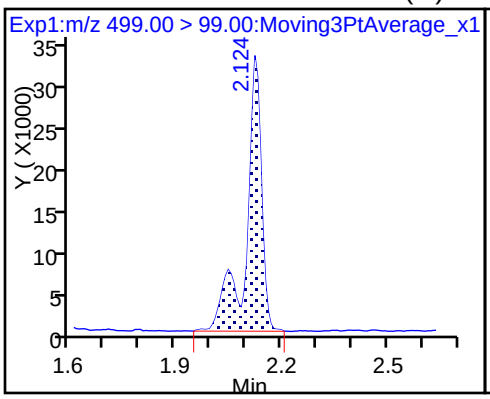
5 Perfluorooctanoic acid



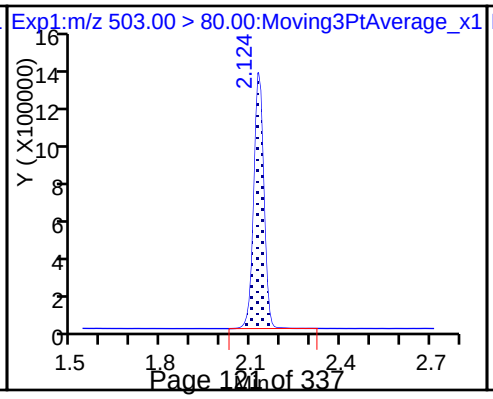
8 Perfluorooctane sulfonic acid (M)



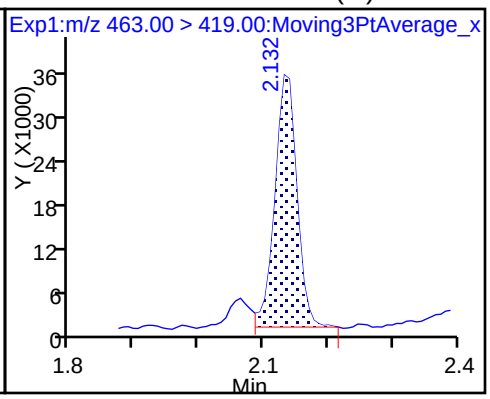
8 Perfluorooctane sulfonic acid (M)



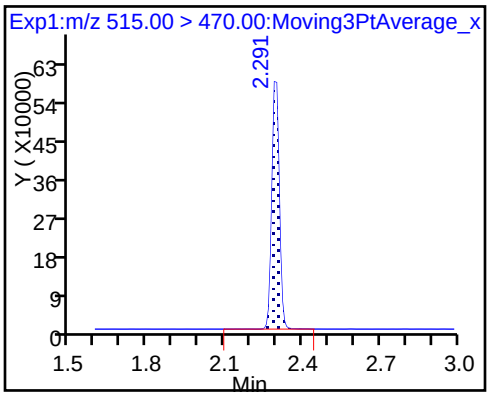
* 7 13C4 PFOS



9 Perfluorononanoic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.291
Y (X10000)
63
54
45
36
27
18
9
0
1.5
1.8
2.1
2.4
2.7
3.0
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_012.d				
Lims ID:	320-33018-A-3-A				
Client ID:	WGNA-110217-RW-3978				
Sample Type:	Client				
Inject. Date:	13-Nov-2017 03:14:37	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-33018-a-3-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	14-Nov-2017 17:11:56	Calib Date:	03-Nov-2017 14:01:24		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK010				
First Level Reviewer: barnettj		Date:	14-Nov-2017 16:58:47		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	7.76	77.59
$ 10 13C2 PFDA	10.0	8.52	85.22

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

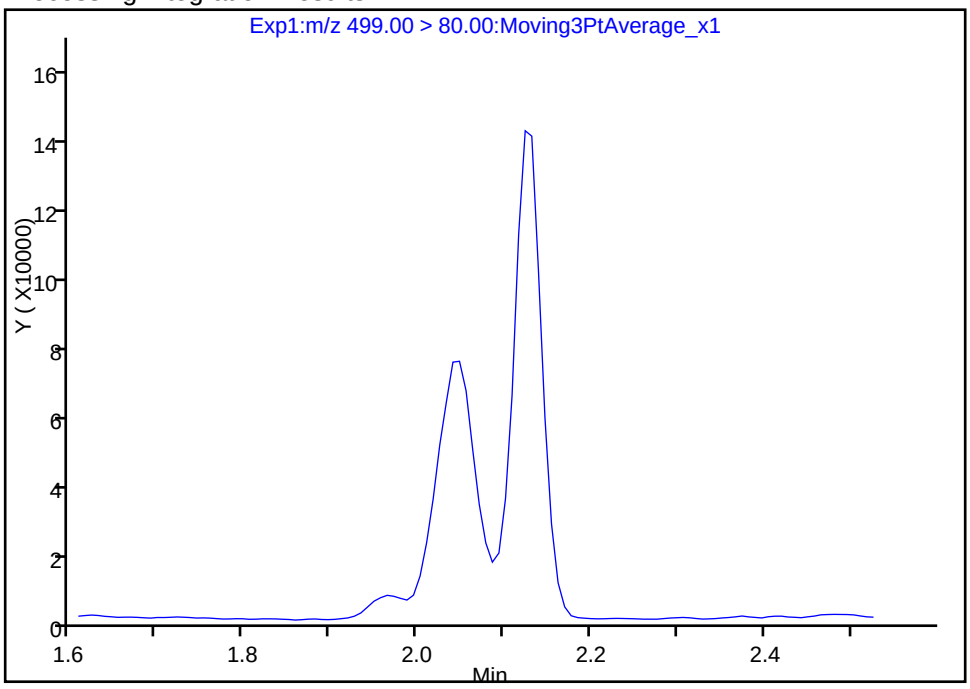
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_012.d				
Injection Date:	13-Nov-2017 03:14:37	Instrument ID:	A8_N		
Lims ID:	320-33018-A-3-A	Lab Sample ID:	320-33018-3		
Client ID:	WGNA-110217-RW-3978				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

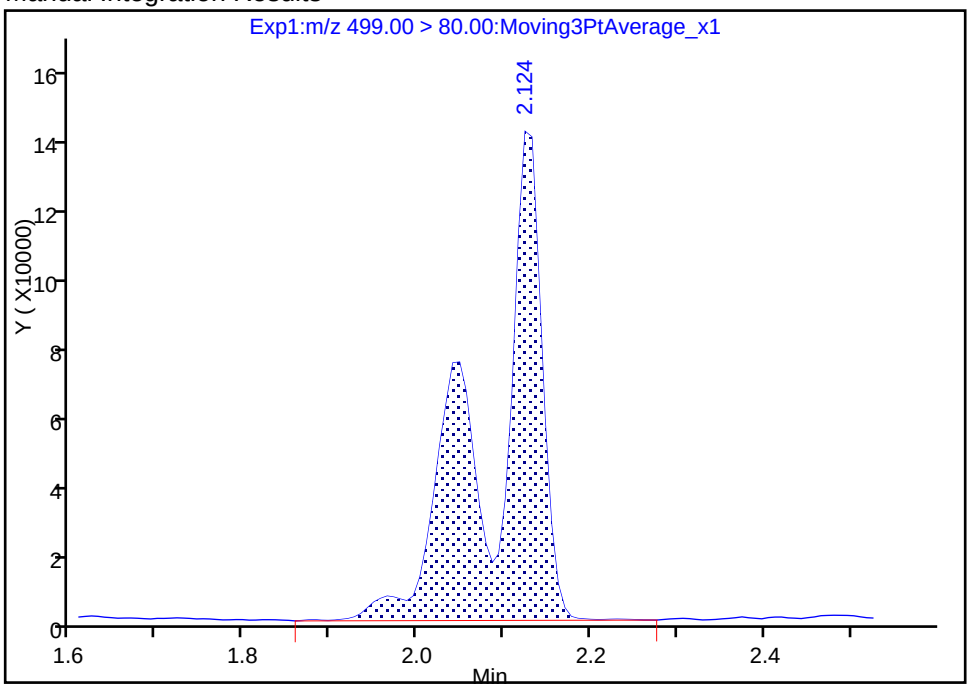
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 557857
Amount: 5.463309
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:57:54
Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

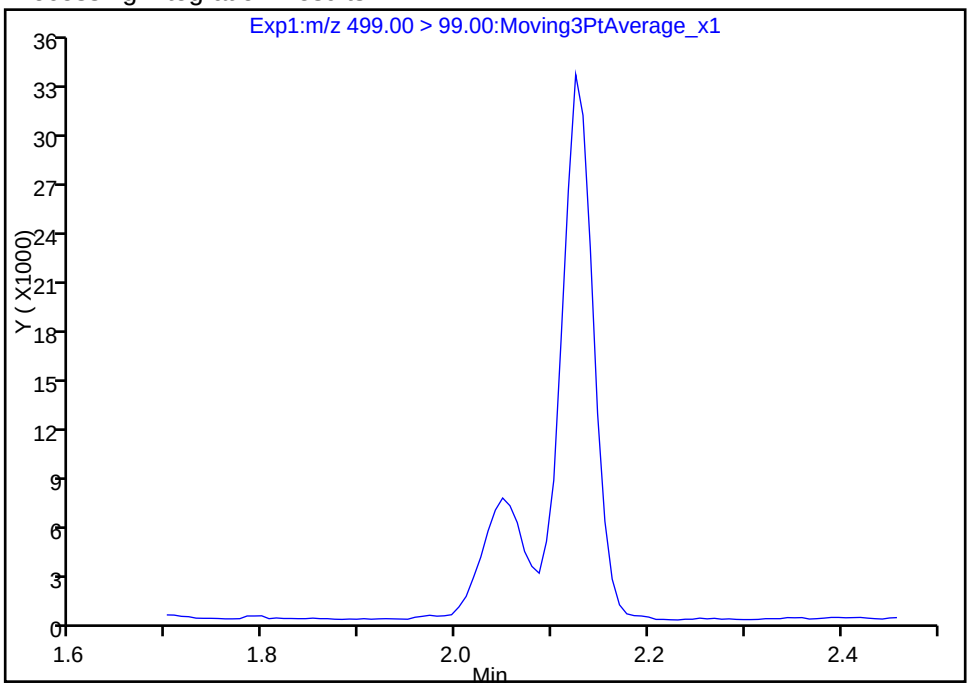
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_012.d				
Injection Date:	13-Nov-2017 03:14:37	Instrument ID:	A8_N		
Lims ID:	320-33018-A-3-A	Lab Sample ID:	320-33018-3		
Client ID:	WGNA-110217-RW-3978				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 2

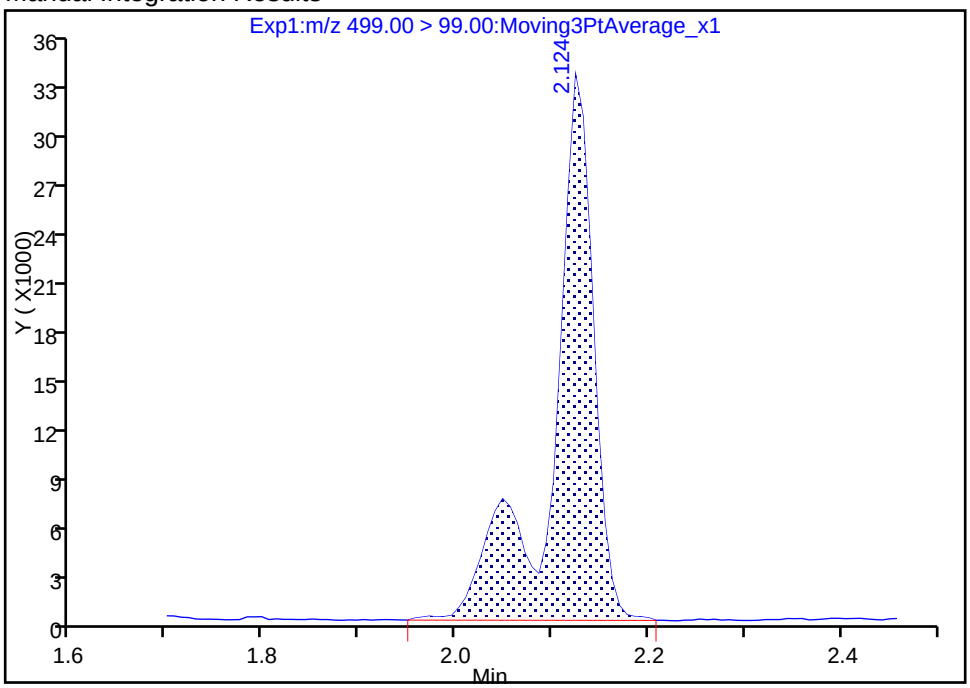
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 100622
Amount: 5.463309
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:58:05
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_012.d

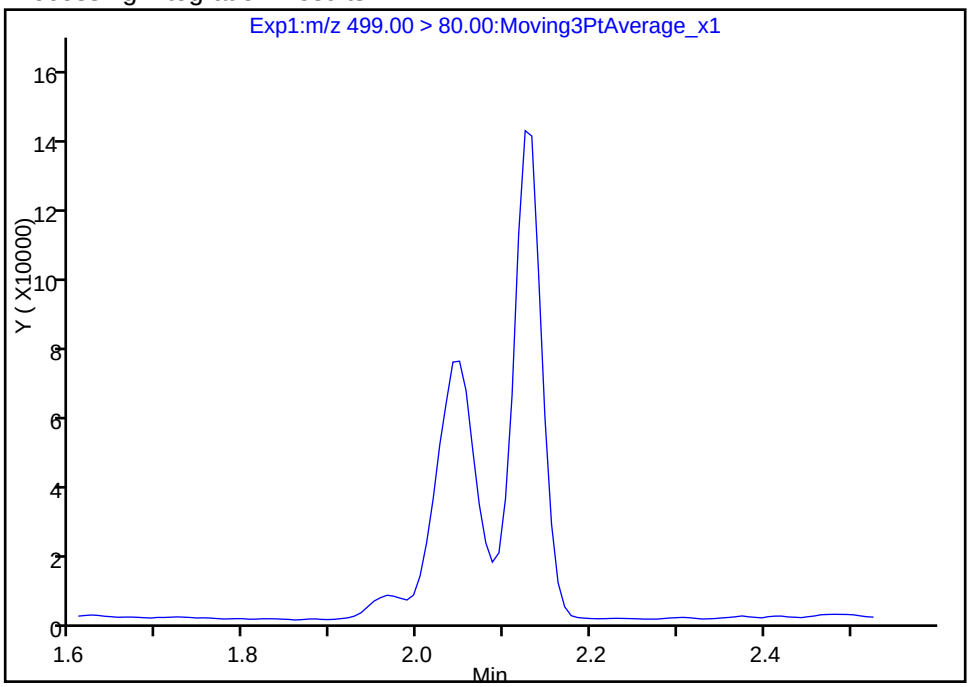
Injection Date:	13-Nov-2017 03:14:37	Instrument ID:	A8_N		
Lims ID:	320-33018-A-3-A	Lab Sample ID:	320-33018-3		
Client ID:	WGNA-110217-RW-3978				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

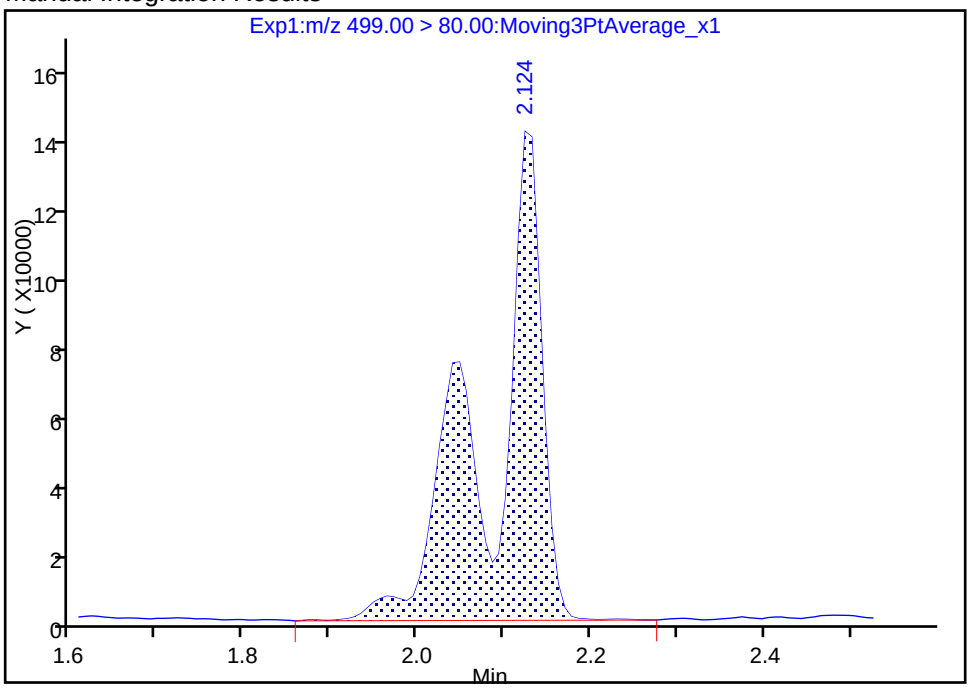
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 557857
Amount: 5.463309
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:58:05
Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento

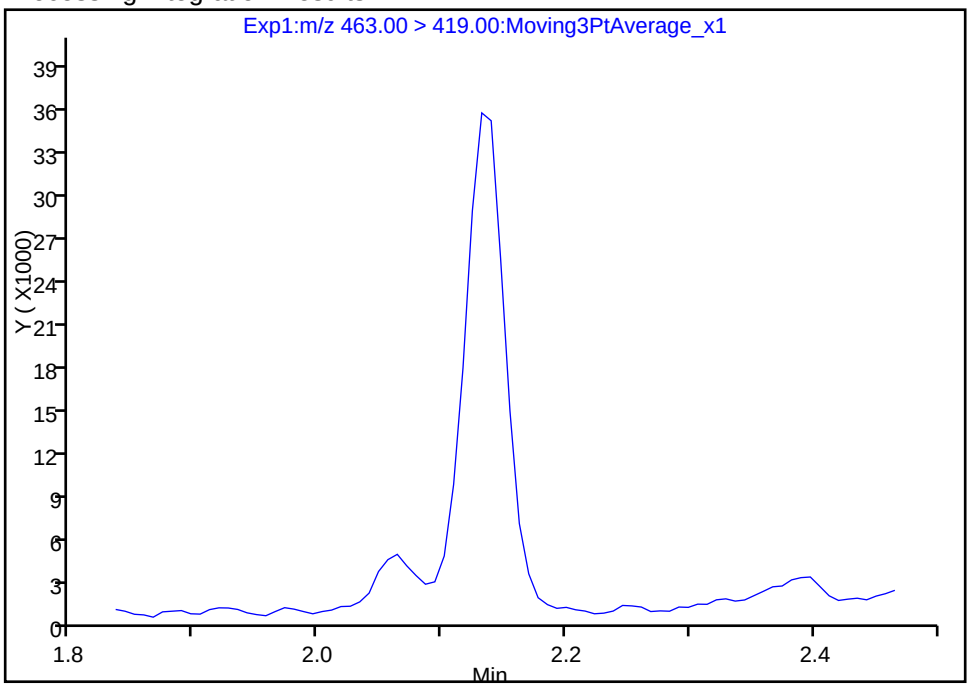
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_012.d				
Injection Date:	13-Nov-2017 03:14:37	Instrument ID:	A8_N		
Lims ID:	320-33018-A-3-A	Lab Sample ID:	320-33018-3		
Client ID:	WGNA-110217-RW-3978				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

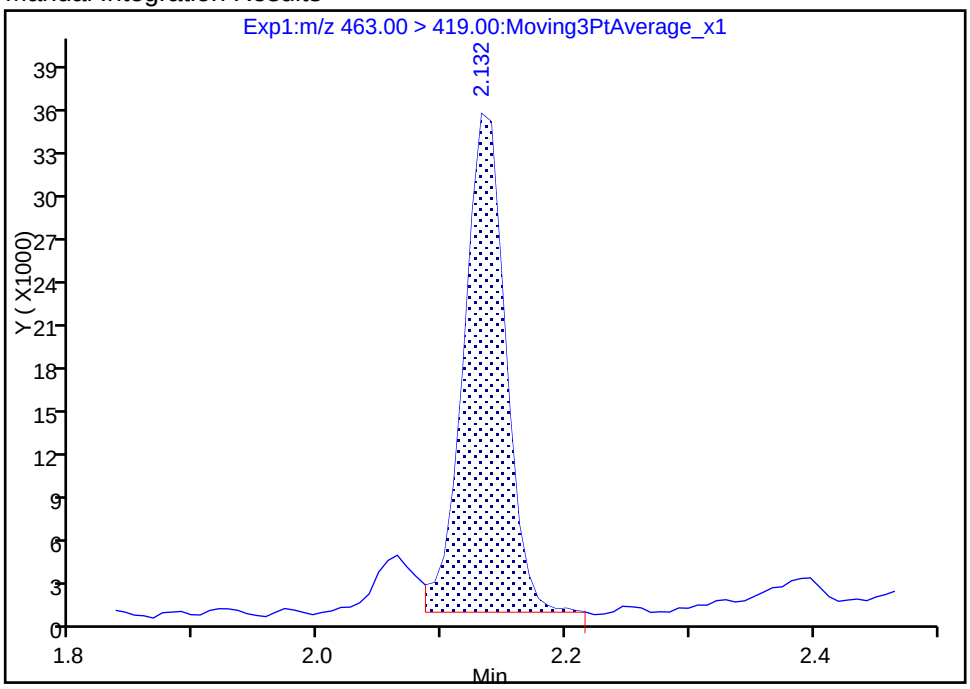
Not Detected
Expected RT: 2.16

Processing Integration Results



Manual Integration Results

RT: 2.13
Area: 80827
Amount: 0.704686
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:58:29
Audit Action: Manually Integrated Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: WGNA-110217-FRB-3978 | Lab Sample ID: 320-33018-4

Matrix: Water | Lab File ID: 2017.11.13_537A_013.d

Analysis Method: 537 | Date Collected: 11/02/2017 08:35

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 247.4(mL) | Date Analyzed: 11/13/2017 03:19

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	82		70-130
STL00996	13C2 PFDA	88		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_013.d
Lims ID: 320-33018-A-4-A
Client ID: WGNA-110217-FRB-3978
Sample Type: Client
Inject. Date: 13-Nov-2017 03:19:19 ALS Bottle#: 7 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-4-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1556393	8.22		6392	
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.913	-0.024		1720859	10.0		5518	
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.151	-0.027		3245665	28.7		4431	
$ 10 13C2 PFDA									
515.00 > 470.00	2.299	2.312	-0.013	1.000	1157291	8.79		7330	

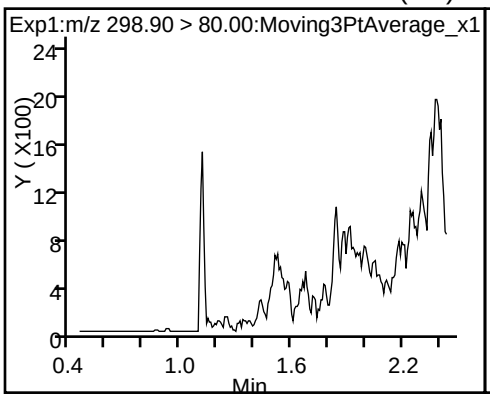
Report Date: 14-Nov-2017 17:12:04 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

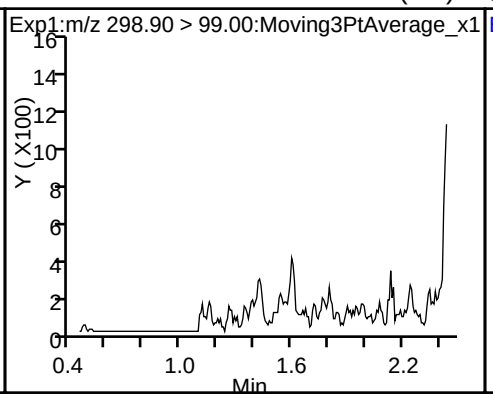
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_013.d

Injection Date:	13-Nov-2017 03:19:19	Instrument ID:	A8_N		
Lims ID:	320-33018-A-4-A	Lab Sample ID:	320-33018-4		
Client ID:	WGNA-110217-FRB-3978				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	7	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

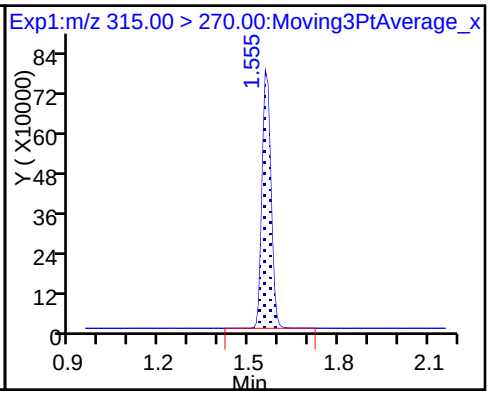
1 Perfluorobutanesulfonic acid (ND)



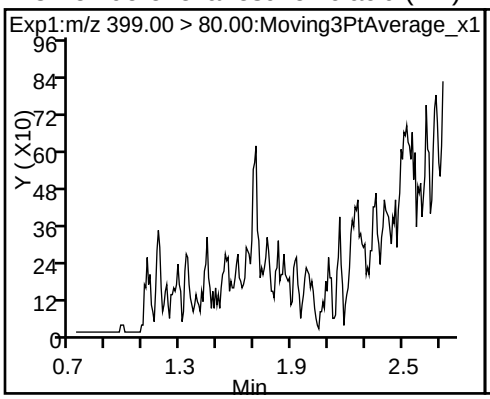
1 Perfluorobutanesulfonic acid (ND)



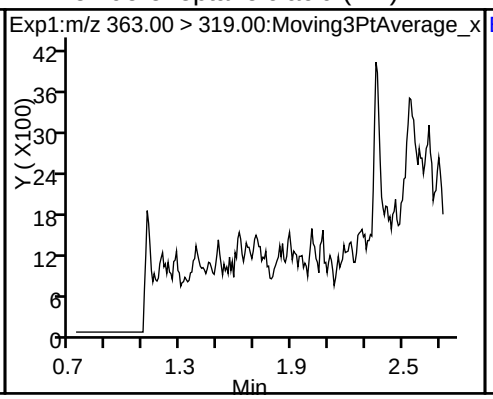
$ 2 13C2 PFHxA



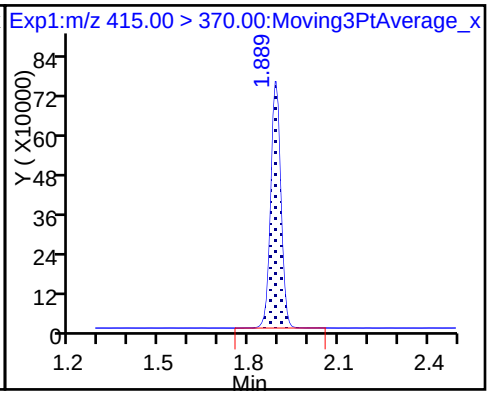
3 Perfluorohexanesulfonic acid (ND)



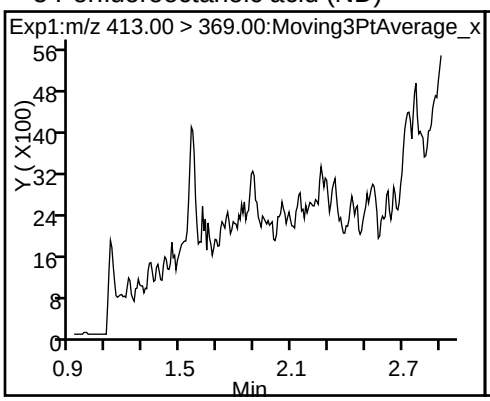
4 Perfluoroheptanoic acid (ND)



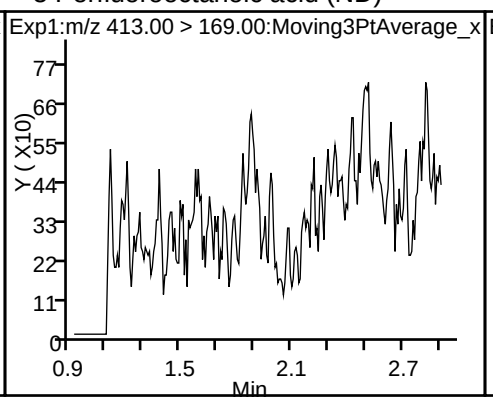
* 6 13C2-PFOA



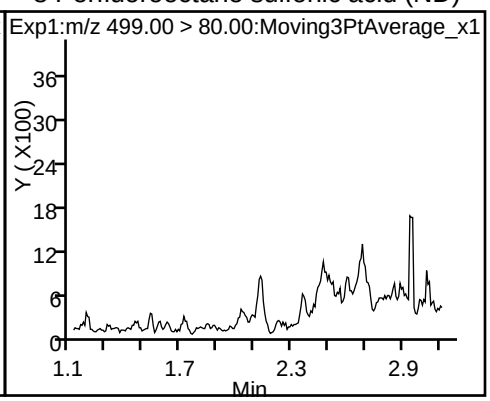
5 Perfluorooctanoic acid (ND)



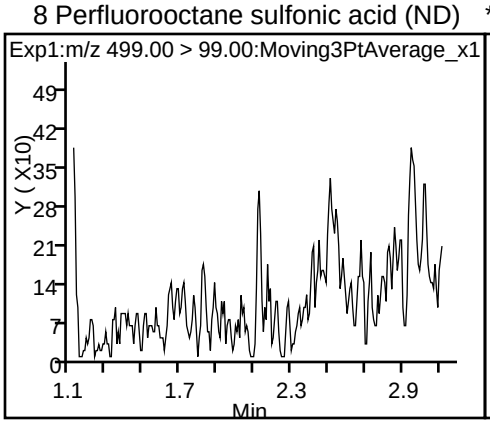
5 Perfluorooctanoic acid (ND)



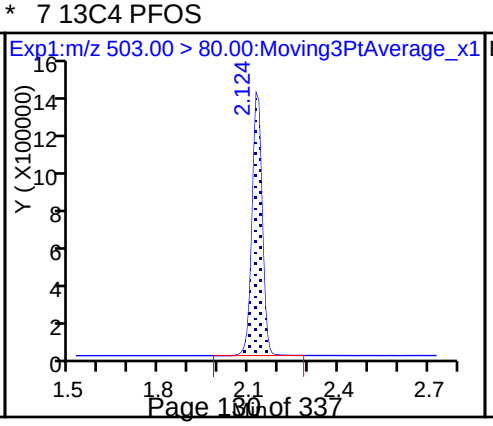
8 Perfluorooctane sulfonic acid (ND)



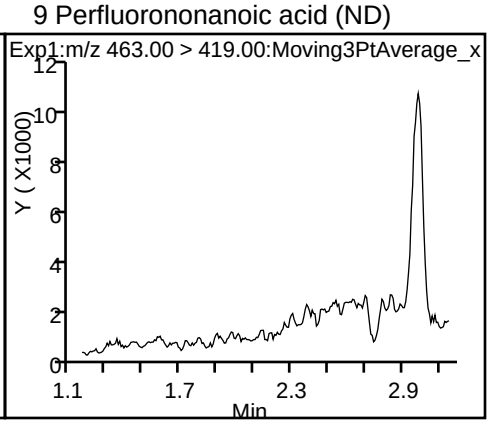
8 Perfluorooctane sulfonic acid (ND)



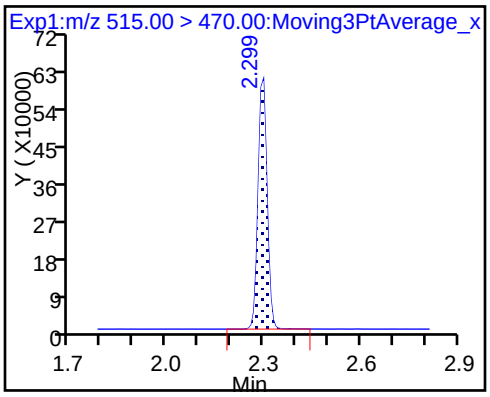
* 7 13C4 PFOS



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.299
Y (X10000)
72
63
54
45
36
27
18
9
0
1.7
2.0
2.3
2.6
2.9
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_013.d				
Lims ID:	320-33018-A-4-A				
Client ID:	WGNA-110217-FRB-3978				
Sample Type:	Client				
Inject. Date:	13-Nov-2017 03:19:19	ALS Bottle#:	7	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-33018-a-4-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	14-Nov-2017 17:11:56	Calib Date:	03-Nov-2017 14:01:24		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK010				

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.22	82.20
$ 10 13C2 PFDA	10.0	8.79	87.89

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-177-IRR Lab Sample ID: 320-33018-5

Matrix: Water Lab File ID: 2017.11.13_537A_014.d

Analysis Method: 537 Date Collected: 11/02/2017 09:10

Extraction Method: 537 Date Extracted: 11/08/2017 11:47

Sample wt/vol: 243.1(mL) Date Analyzed: 11/13/2017 03:24

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	41	M	41	16	7.0
335-67-1	Perfluorooctanoic acid (PFOA)	16	J	21	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	21	U M	25	21	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	29	J	31	12	5.7
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.0	J M	10	4.1	2.0
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	93	37	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	60	Q	70-130
STL00996	13C2 PFDA	88		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_014.d
Lims ID: 320-33018-A-5-A
Client ID: NAWC-110217-RW-177-IRR
Sample Type: Client
Inject. Date: 13-Nov-2017 03:24:00 ALS Bottle#: 8 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-5-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 17:00:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.444	-0.018	1.000	159462	1.02		71.3	
298.90 > 99.00	1.426	1.444	-0.018	1.000	116863		1.36(0.00-0.00)	286	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1294457	6.00		5237	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.725	-0.026	1.000	1632810	6.95		926	
4 Perfluoroheptanoic acid									M
363.00 > 319.00	1.699	1.725	-0.026	1.000	269805	1.47		59.5	M
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.913	-0.031		1959199	10.0		8223	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.882	1.914	-0.032	1.000	727237	4.01		115	
413.00 > 169.00	1.882	1.914	-0.032	1.000	411935		1.77(0.00-0.00)	369	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.124	2.117	0.007	1.000	1305851	9.92		760	M
499.00 > 99.00	2.124	2.117	0.007	1.000	279861		4.67(0.00-0.00)	467	M
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.151	-0.027		4022877	28.7		3873	
9 Perfluorononanoic acid									M
463.00 > 419.00	2.132	2.158	-0.026	1.000	55746	0.4284		14.1	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.312	-0.021	1.000	1326431	8.85		8771	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 14-Nov-2017 17:12:05 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_014.d

Injection Date: 13-Nov-2017 03:24:00 Instrument ID: A8_N

Lims ID: 320-33018-A-5-A Lab Sample ID: 320-33018-5

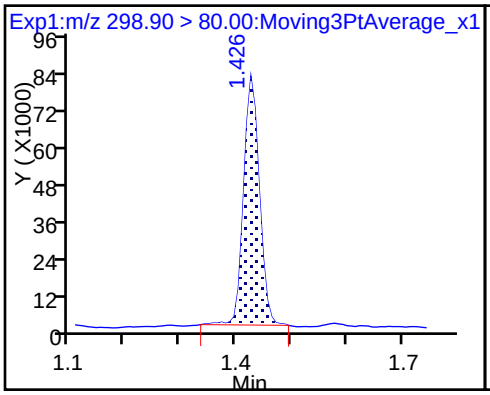
Client ID: NAWC-110217-RW-177-IRR

Operator ID: SACINSTLCMS01 ALS Bottle#: 8 Worklist Smp#: 11

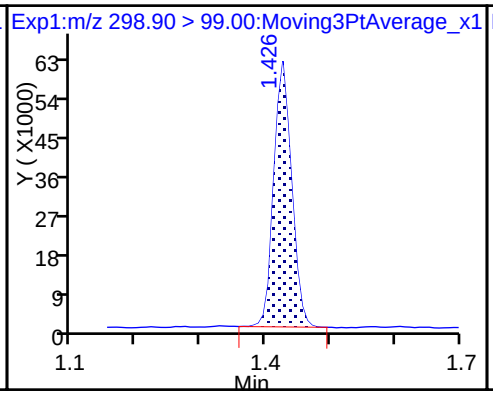
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

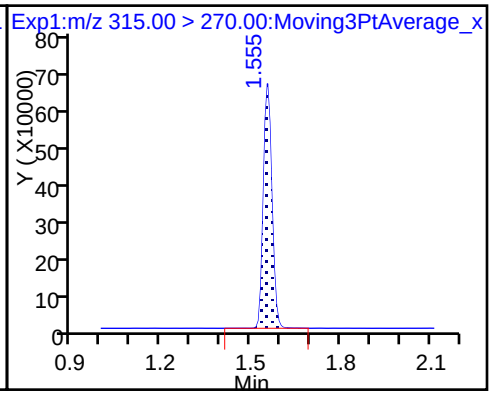
1 Perfluorobutanesulfonic acid



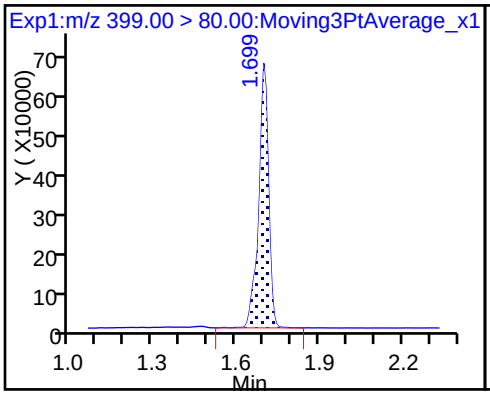
1 Perfluorobutanesulfonic acid



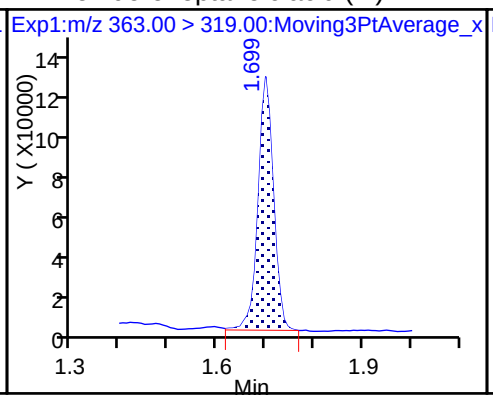
$ 2 13C2 PFHxA



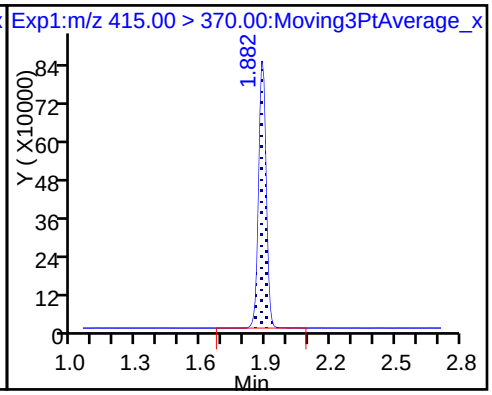
3 Perfluorohexanesulfonic acid



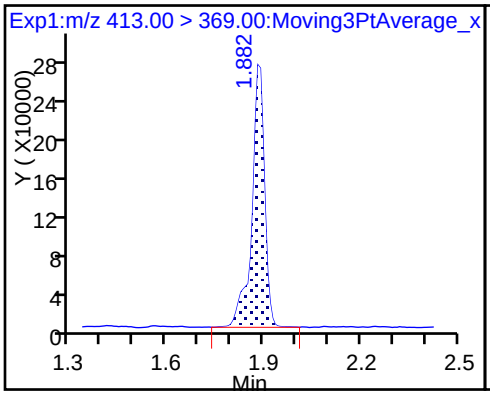
4 Perfluoroheptanoic acid (M)



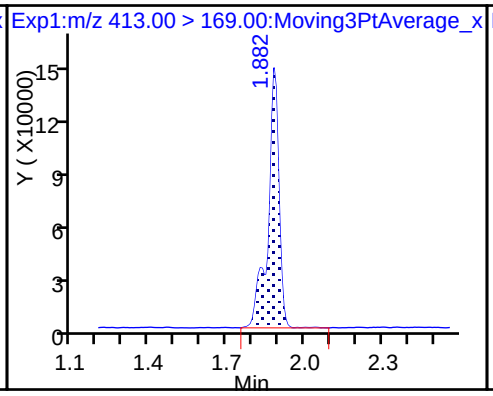
* 6 13C2-PFOA



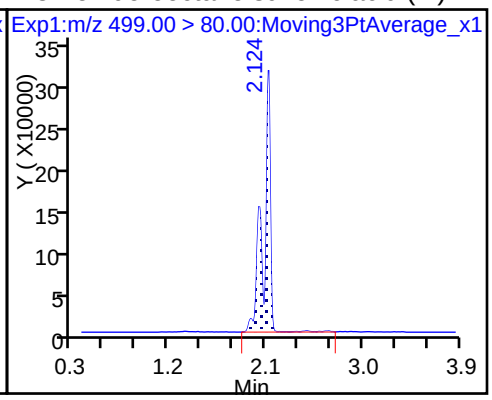
5 Perfluorooctanoic acid



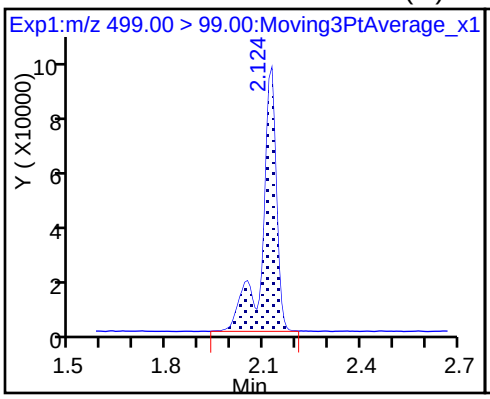
5 Perfluorooctanoic acid



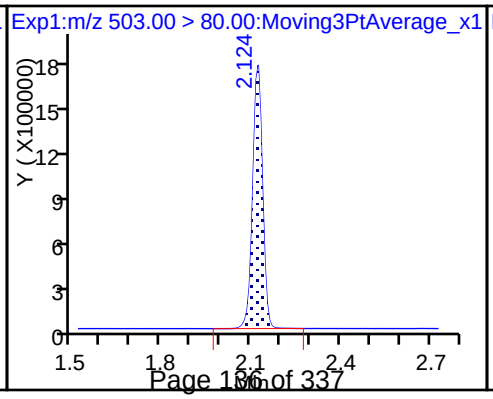
8 Perfluorooctane sulfonic acid (M)



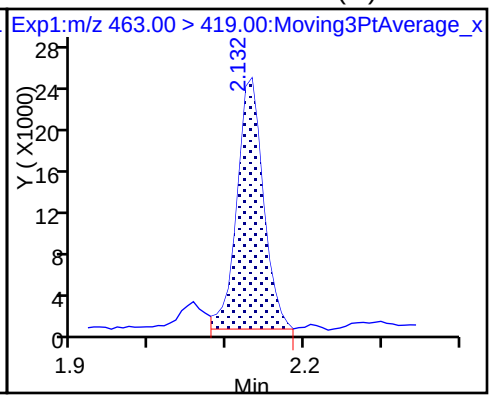
8 Perfluorooctane sulfonic acid (M)



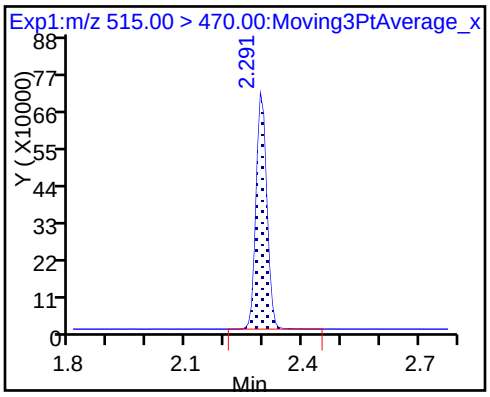
* 7 13C4 PFOS



9 Perfluorononanoic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.291
Y (X10000)
88
77
66
55
44
33
22
11
0
1.8
2.1
2.4
2.7
Min

Report Date: 14-Nov-2017 17:12:05 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_014.d				
Lims ID:	320-33018-A-5-A				
Client ID:	NAWC-110217-RW-177-IRR				
Sample Type:	Client				
Inject. Date:	13-Nov-2017 03:24:00	ALS Bottle#:	8	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-33018-a-5-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	14-Nov-2017 17:11:56	Calib Date:	03-Nov-2017 14:01:24		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK010				
First Level Reviewer: barnettj		Date:	14-Nov-2017 17:00:51		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	6.00	60.05
$ 10 13C2 PFDA	10.0	8.85	88.48

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

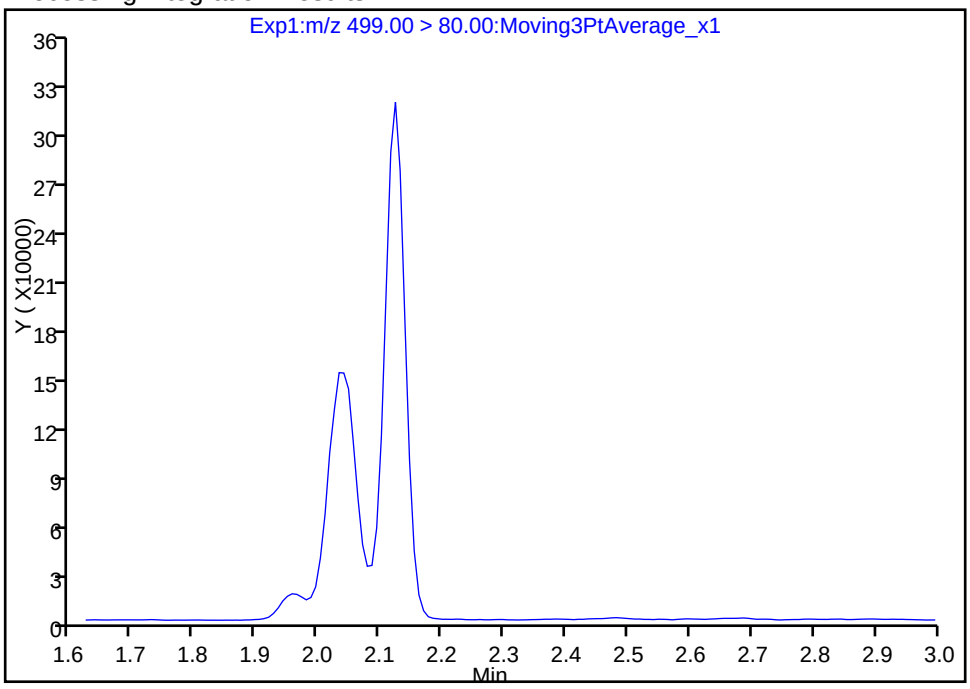
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_014.d				
Injection Date:	13-Nov-2017 03:24:00	Instrument ID:	A8_N		
Lims ID:	320-33018-A-5-A	Lab Sample ID:	320-33018-5		
Client ID:	NAWC-110217-RW-177-IRR				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	8	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

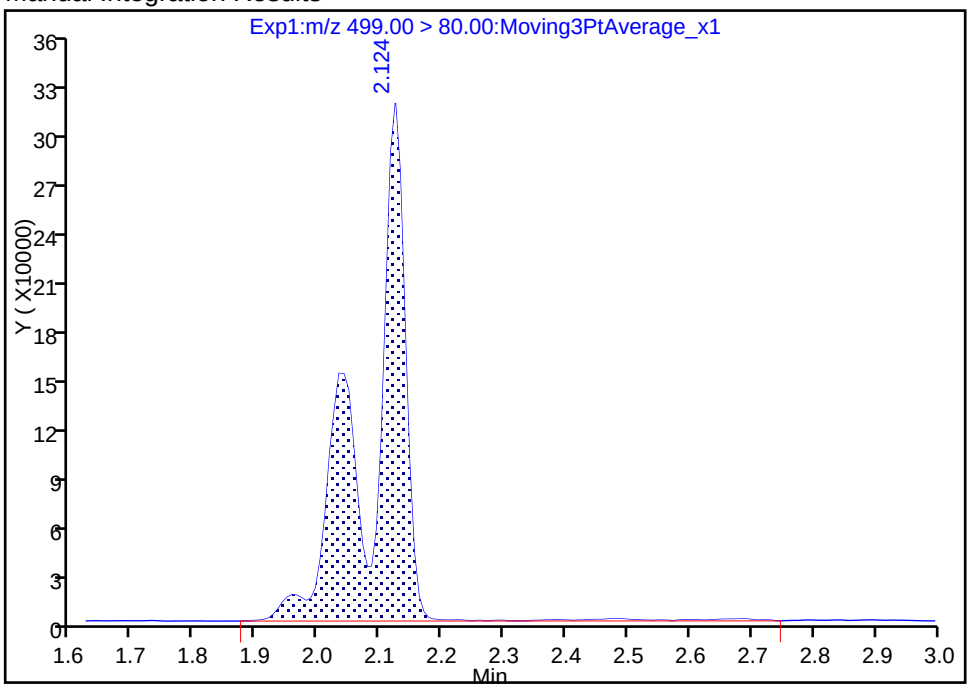
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 1305851
Amount: 9.915033
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:59:28
Audit Action: Assigned Compound ID Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

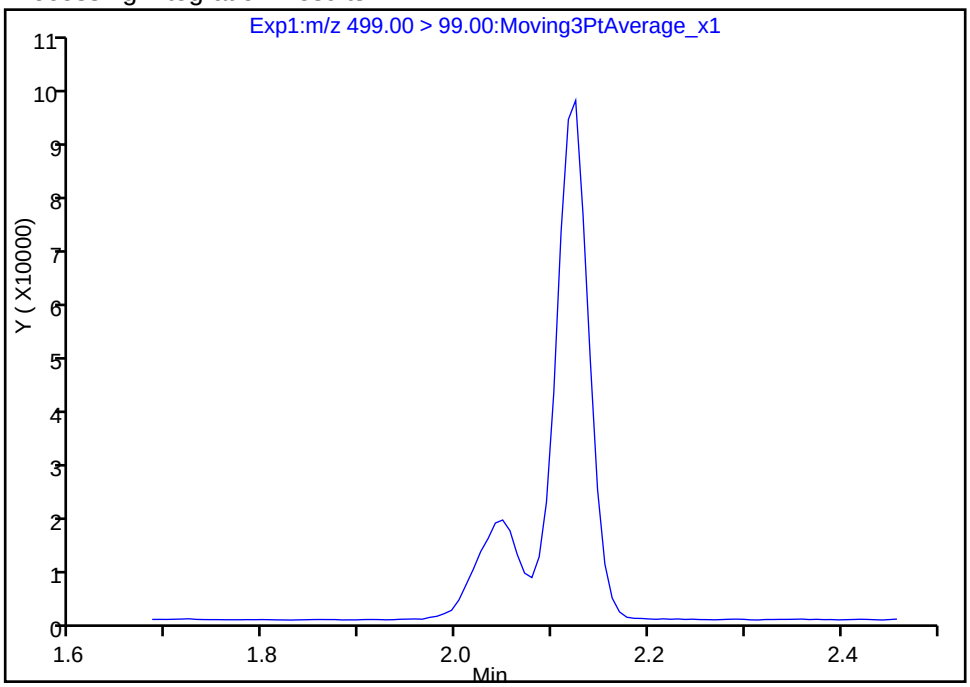
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_014.d				
Injection Date:	13-Nov-2017 03:24:00	Instrument ID:	A8_N		
Lims ID:	320-33018-A-5-A	Lab Sample ID:	320-33018-5		
Client ID:	NAWC-110217-RW-177-IRR				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	8	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 2

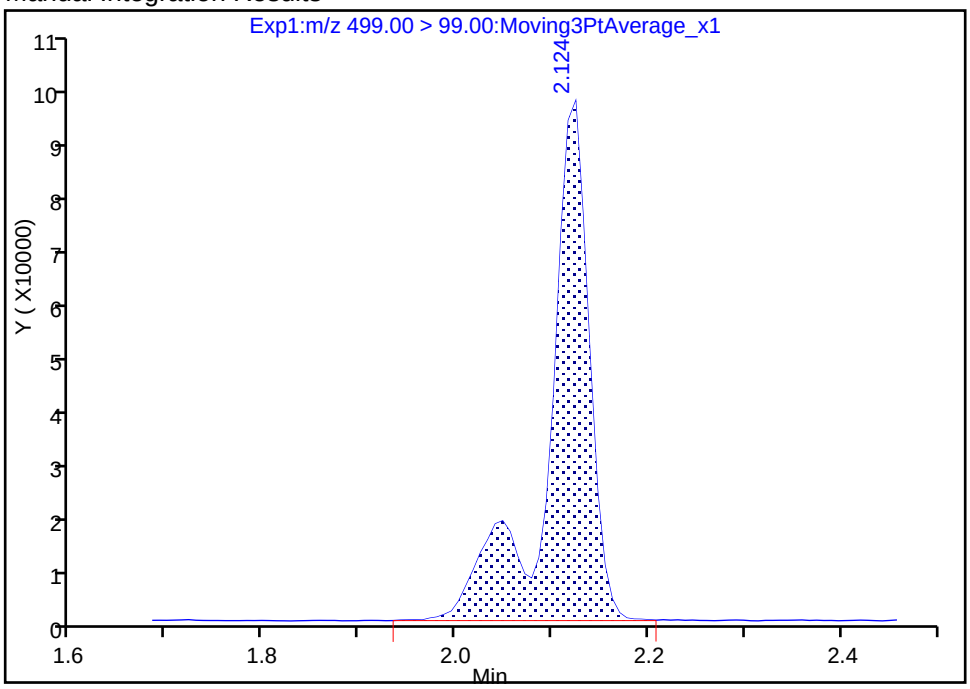
Not Detected
Expected RT: 2.12

Processing Integration Results



RT: 2.12
Area: 279861
Amount: 9.915033
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 14-Nov-2017 16:59:40
Audit Action: Manually Integrated Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

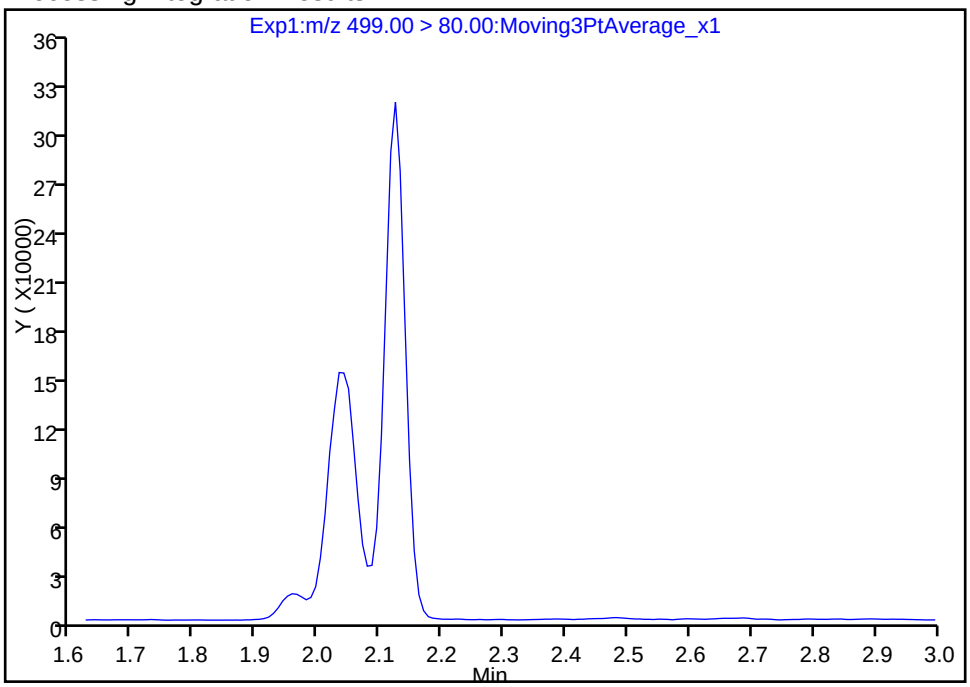
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_014.d				
Injection Date:	13-Nov-2017 03:24:00	Instrument ID:	A8_N		
Lims ID:	320-33018-A-5-A	Lab Sample ID:	320-33018-5		
Client ID:	NAWC-110217-RW-177-IRR				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	8	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

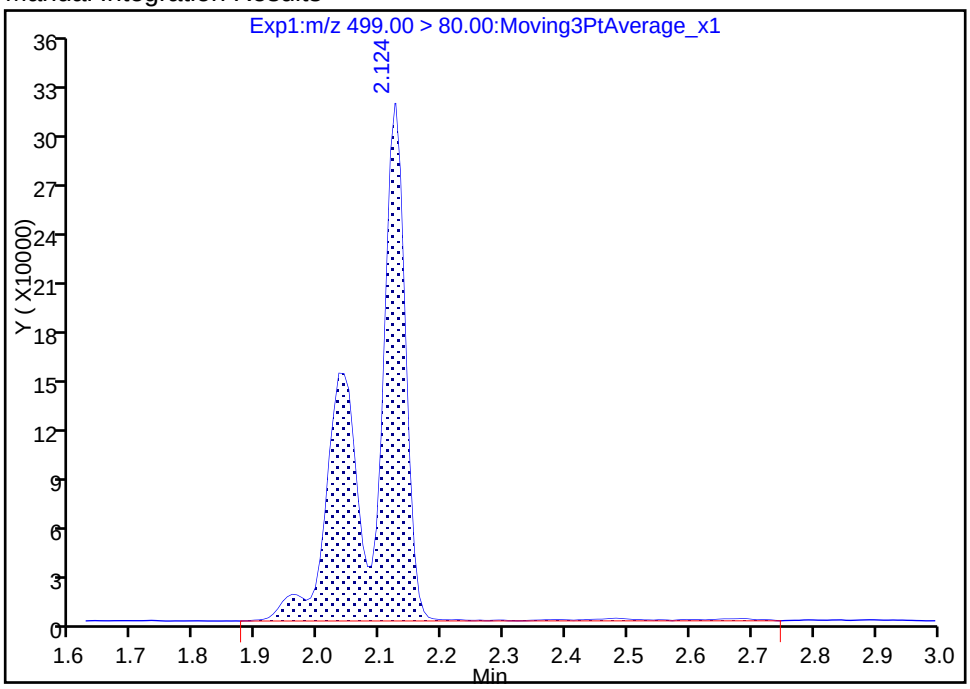
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 1305851
Amount: 9.915033
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:59:40
Audit Action: Manually Integrated Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

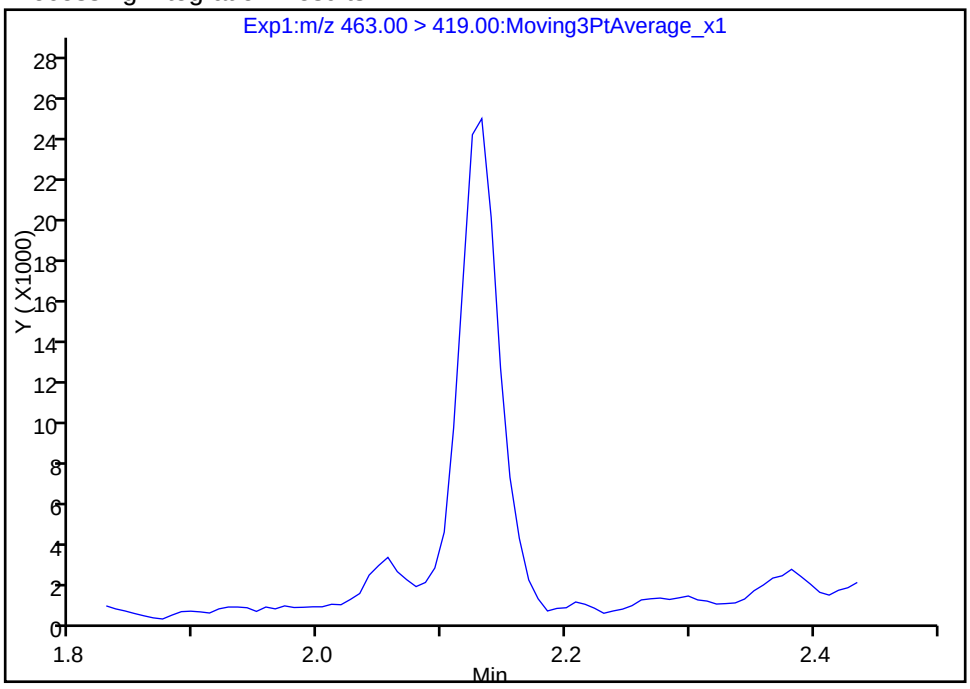
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_014.d				
Injection Date:	13-Nov-2017 03:24:00	Instrument ID:	A8_N		
Lims ID:	320-33018-A-5-A	Lab Sample ID:	320-33018-5		
Client ID:	NAWC-110217-RW-177-IRR				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	8	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

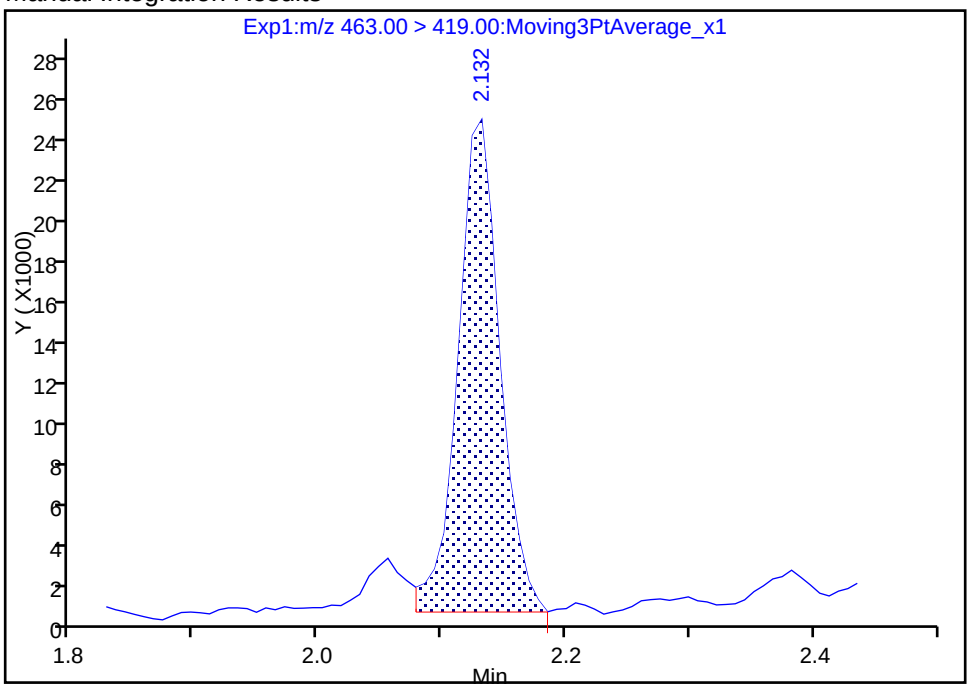
Not Detected
Expected RT: 2.16

Processing Integration Results



Manual Integration Results

RT: 2.13
Area: 55746
Amount: 0.428412
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:00:42
Audit Action: Manually Integrated Audit Reason: Missed Peak

TestAmerica Sacramento

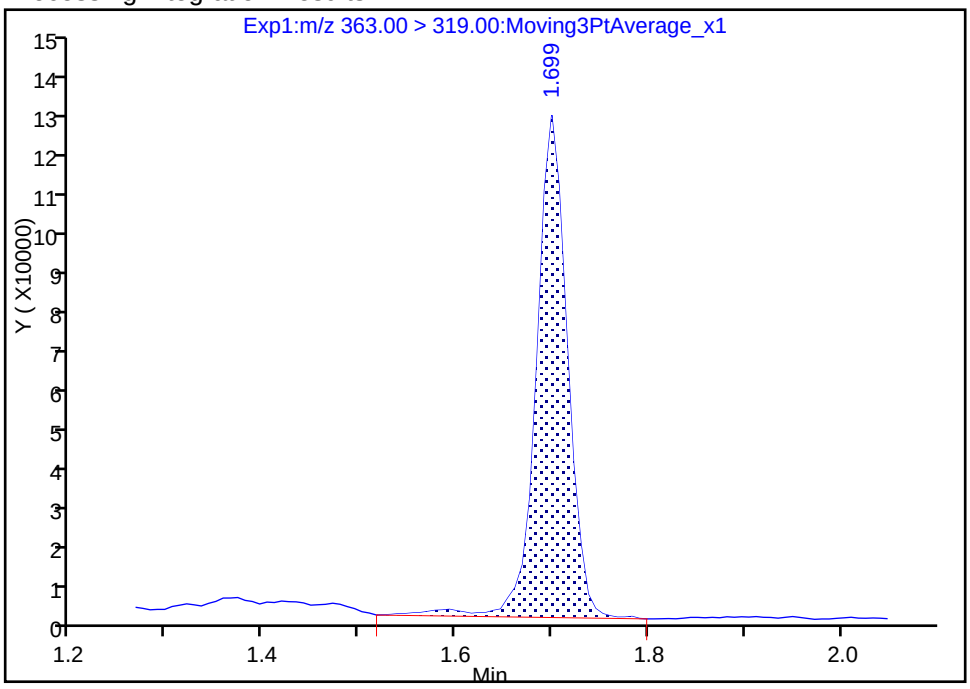
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_014.d				
Injection Date:	13-Nov-2017 03:24:00	Instrument ID:	A8_N		
Lims ID:	320-33018-A-5-A	Lab Sample ID:	320-33018-5		
Client ID:	NAWC-110217-RW-177-IRR				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	8	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

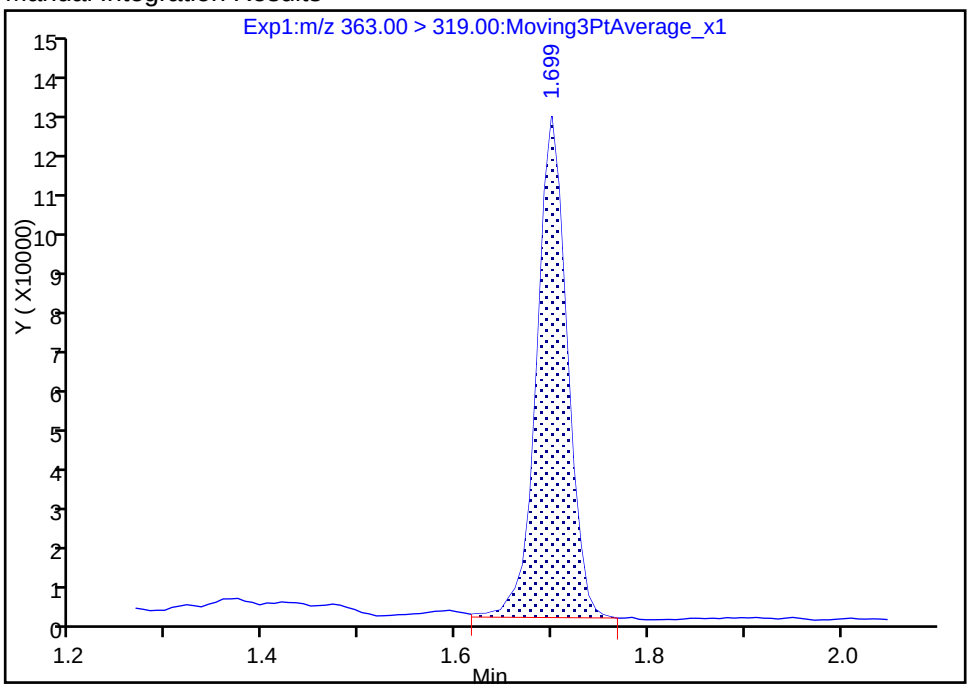
Processing Integration Results

RT: 1.70
Area: 276847
Amount: 1.508207
Amount Units: ng/ml



Manual Integration Results

RT: 1.70
Area: 269805
Amount: 1.469844
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:59:18
Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-177-IRR Lab Sample ID: 320-33018-6

Matrix: Water Lab File ID: 2017.11.13_537A_015.d

Analysis Method: 537 Date Collected: 11/02/2017 09:05

Extraction Method: 537 Date Extracted: 11/08/2017 11:47

Sample wt/vol: 246.3(mL) Date Analyzed: 11/13/2017 03:28

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	91	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	89		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_015.d
Lims ID: 320-33018-A-6-A
Client ID: NAWC-110217-FRB-177-IRR
Sample Type: Client
Inject. Date: 13-Nov-2017 03:28:39 ALS Bottle#: 9 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-6-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.548	1.573	-0.025	1.000	1554275	8.73		6053	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.913	-0.031		1618805	10.0		5320	
* 7 13C4 PFOS									
503.00 > 80.00	2.117	2.151	-0.034		3182899	28.7		3993	
$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.312	-0.021	1.000	1102314	8.90		6073	

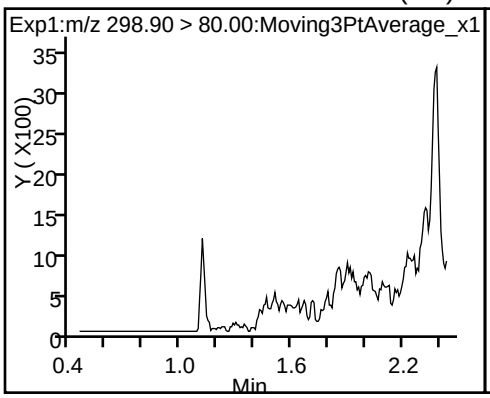
Report Date: 14-Nov-2017 17:12:06 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

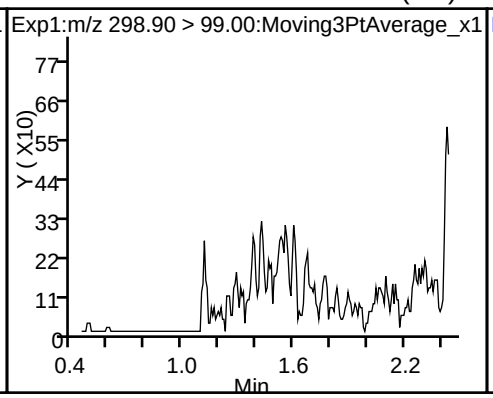
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_015.d

Injection Date:	13-Nov-2017 03:28:39	Instrument ID:	A8_N		
Lims ID:	320-33018-A-6-A	Lab Sample ID:	320-33018-6		
Client ID:	NAWC-110217-FRB-177-IRR				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	9	Worklist Smp#:	12
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

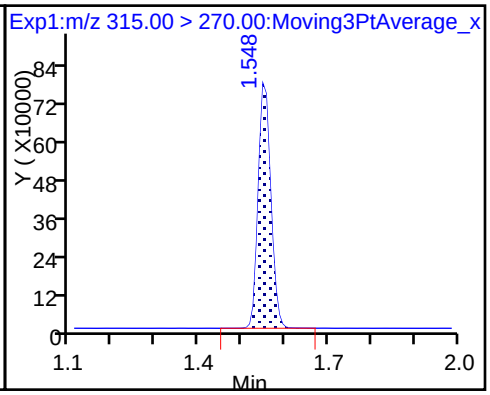
1 Perfluorobutanesulfonic acid (ND)



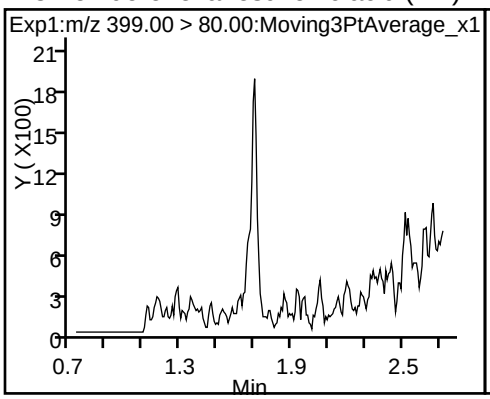
1 Perfluorobutanesulfonic acid (ND)



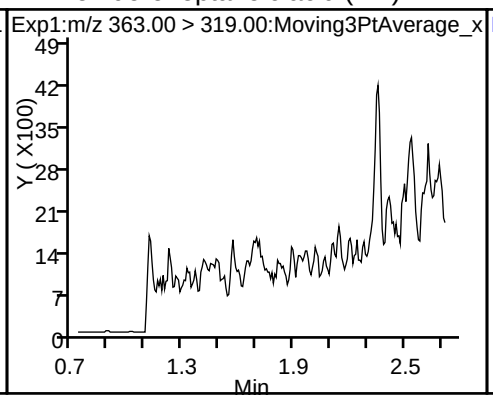
$ 2 13C2 PFHxA



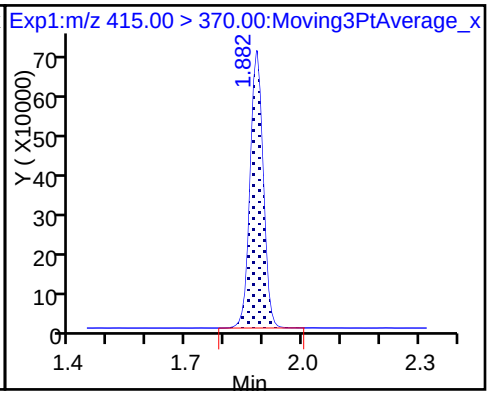
3 Perfluorohexanesulfonic acid (ND)



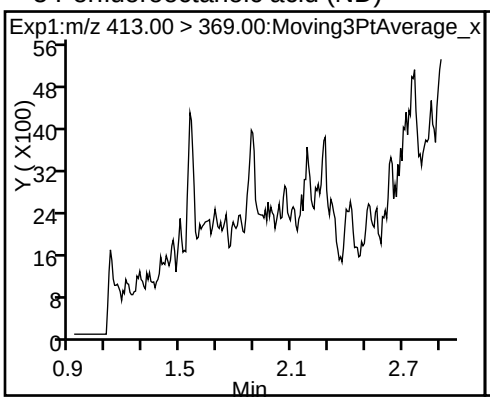
4 Perfluoroheptanoic acid (ND)



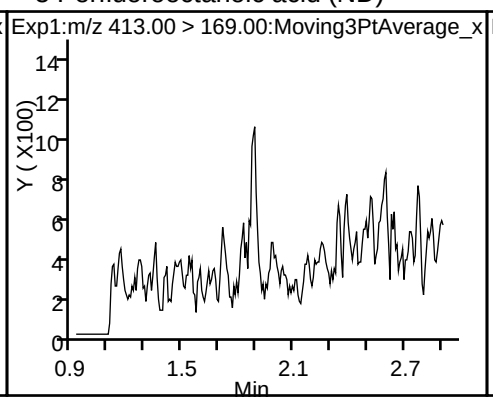
* 6 13C2-PFOA



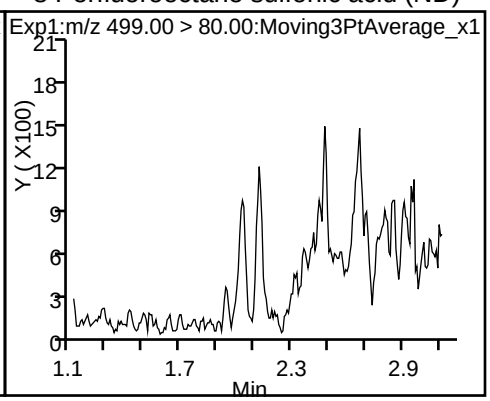
5 Perfluorooctanoic acid (ND)



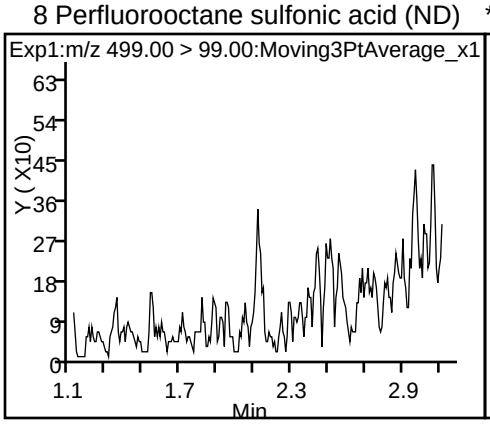
5 Perfluorooctanoic acid (ND)



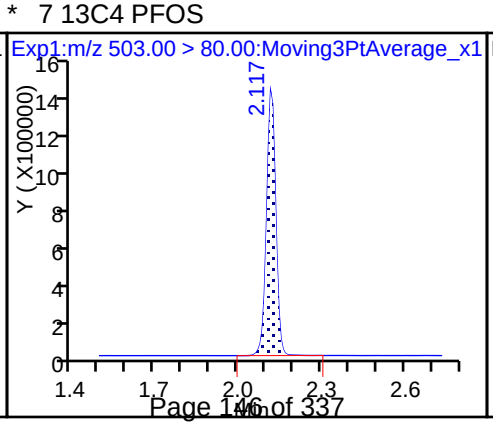
8 Perfluorooctane sulfonic acid (ND)



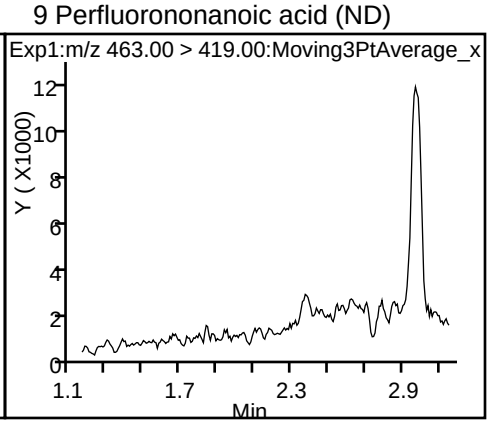
8 Perfluorooctane sulfonic acid (ND)



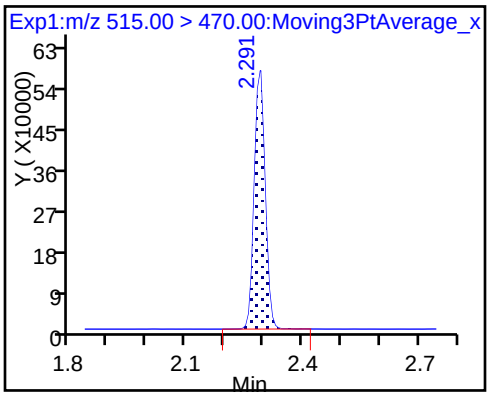
* 7 13C4 PFOS



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.291
Y (X10000)
63
54
45
36
27
18
9
0
1.8
2.1
2.4
2.7
Min

TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_015.d
Lims ID: 320-33018-A-6-A
Client ID: NAWC-110217-FRB-177-IRR
Sample Type: Client
Inject. Date: 13-Nov-2017 03:28:39 ALS Bottle#: 9 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-6-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.73	87.26
$ 10 13C2 PFDA	10.0	8.90	88.99

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-177-SHOP Lab Sample ID: 320-33018-7

Matrix: Water Lab File ID: 2017.11.13_537A_016.d

Analysis Method: 537 Date Collected: 11/02/2017 09:20

Extraction Method: 537 Date Extracted: 11/08/2017 11:47

Sample wt/vol: 243.8(mL) Date Analyzed: 11/13/2017 03:33

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J	41	16	7.0
335-67-1	Perfluorooctanoic acid (PFOA)	12	J	21	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	21	U M	25	21	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	14	J	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	48	Q	70-130
STL00996	13C2 PFDA	84		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_016.d
Lims ID: 320-33018-A-7-A
Client ID: NAWC-110217-RW-177-SHOP
Sample Type: Client
Inject. Date: 13-Nov-2017 03:33:20 ALS Bottle#: 10 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-7-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 17:01:42

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.444	-0.018	1.000	94534	0.7643		41.1	
298.90 > 99.00	1.426	1.444	-0.018	1.000	68756		1.37(0.00-0.00)	142	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	873581	4.78		3579	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.725	-0.026	1.000	631994	3.41		401	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.725	-0.026	1.000	154508	0.99		28.3	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.913	-0.031		1661894	10.0		5776	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.882	1.914	-0.032	1.000	448392	2.91		64.7	
413.00 > 169.00	1.882	1.914	-0.032	1.000	260127		1.72(0.00-0.00)	236	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.124	2.117	0.007	1.000	525794	5.06		298	
499.00 > 99.00	2.124	2.117	0.007	1.000	100435		5.24(0.00-0.00)	171	
* 7 13C4 PFOS									
503.00 > 80.00	2.117	2.151	-0.034		3172392	28.7		3462	
9 Perfluorononanoic acid									M
463.00 > 419.00	2.124	2.158	-0.034	1.000	37915	0.3435		9.4	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.312	-0.021	1.000	1066872	8.39		8111	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 14-Nov-2017 17:12:06 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_016.d

Injection Date: 13-Nov-2017 03:33:20 Instrument ID: A8_N

Lims ID: 320-33018-A-7-A Lab Sample ID: 320-33018-7

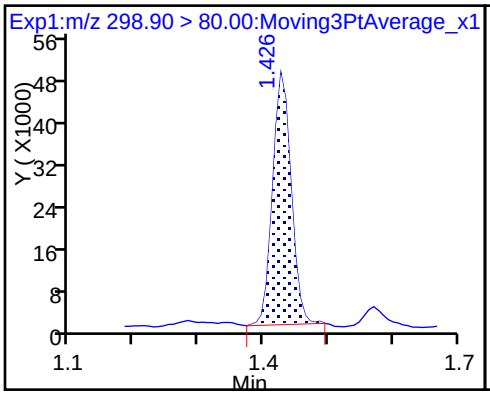
Client ID: NAWC-110217-RW-177-SHOP

Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 13

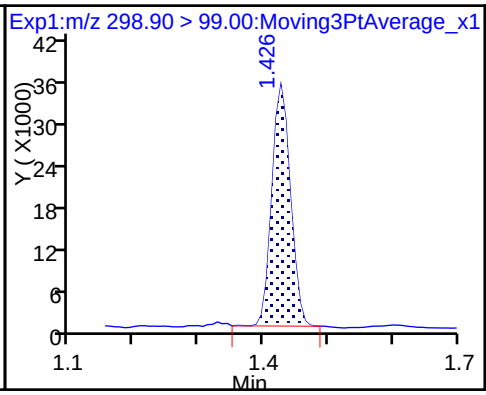
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

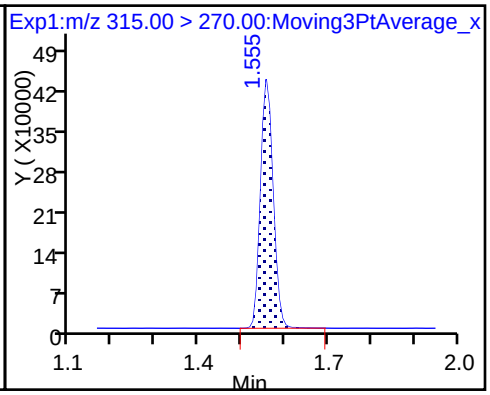
1 Perfluorobutanesulfonic acid



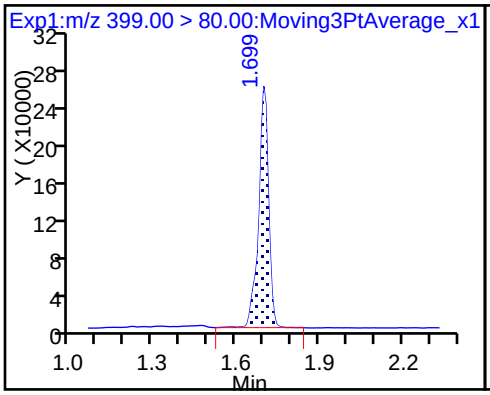
1 Perfluorobutanesulfonic acid



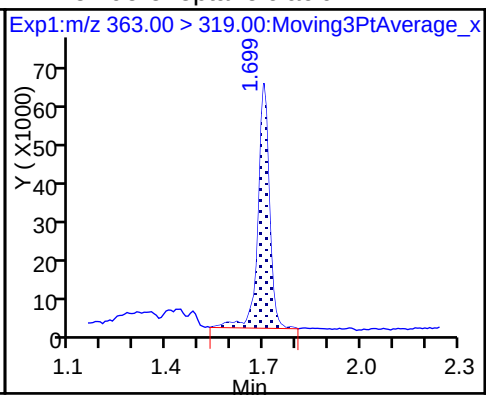
$ 2 13C2 PFHxA



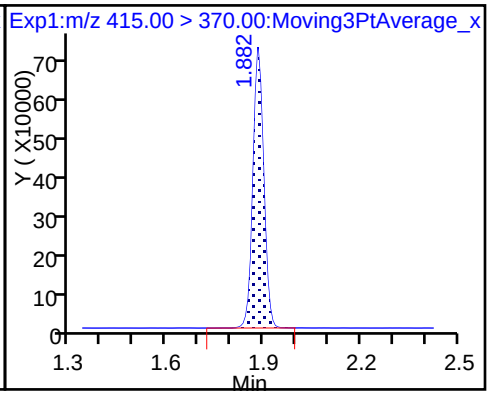
3 Perfluorohexanesulfonic acid



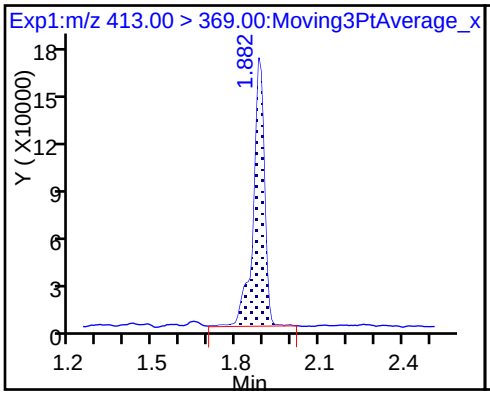
4 Perfluoroheptanoic acid



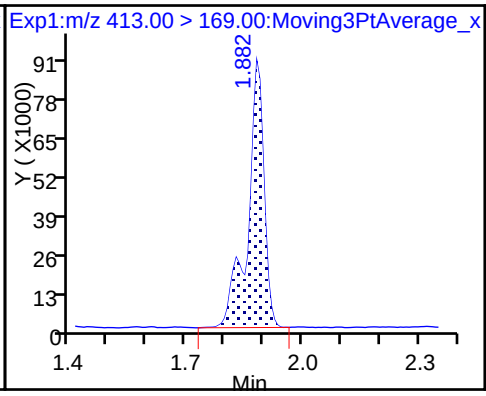
* 6 13C2-PFOA



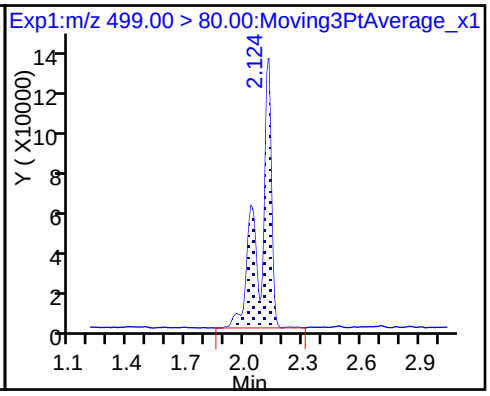
5 Perfluorooctanoic acid



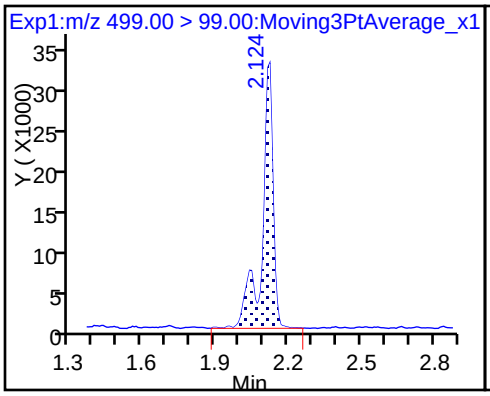
5 Perfluorooctanoic acid



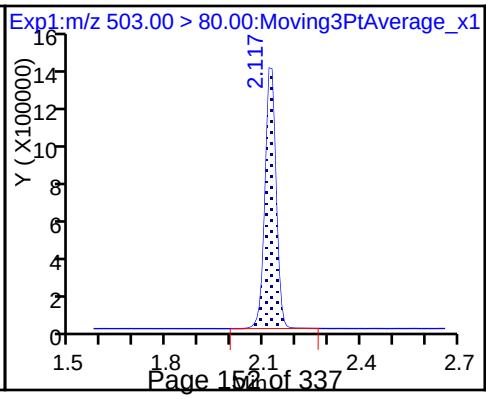
8 Perfluorooctane sulfonic acid



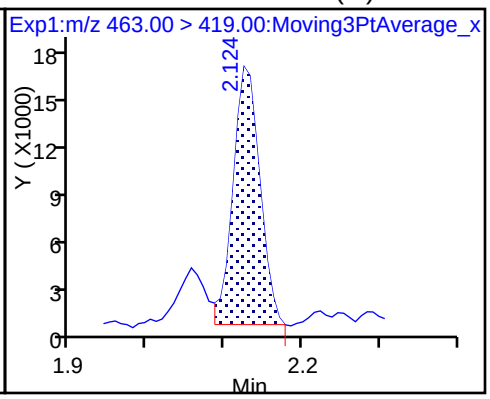
8 Perfluorooctane sulfonic acid



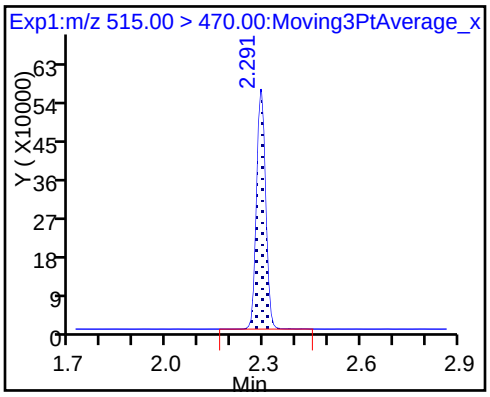
* 7 13C4 PFOS



9 Perfluorononanoic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.291
Y (X10000)
63
54
45
36
27
18
9
0
1.7
2.0
2.3
2.6
2.9
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_016.d				
Lims ID:	320-33018-A-7-A				
Client ID:	NAWC-110217-RW-177-SHOP				
Sample Type:	Client				
Inject. Date:	13-Nov-2017 03:33:20	ALS Bottle#:	10	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-33018-a-7-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	14-Nov-2017 17:11:56	Calib Date:	03-Nov-2017 14:01:24		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK010				
First Level Reviewer: barnettj		Date:	14-Nov-2017 17:01:42		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	4.78	47.77
$ 10 13C2 PFDA	10.0	8.39	83.89

TestAmerica Sacramento

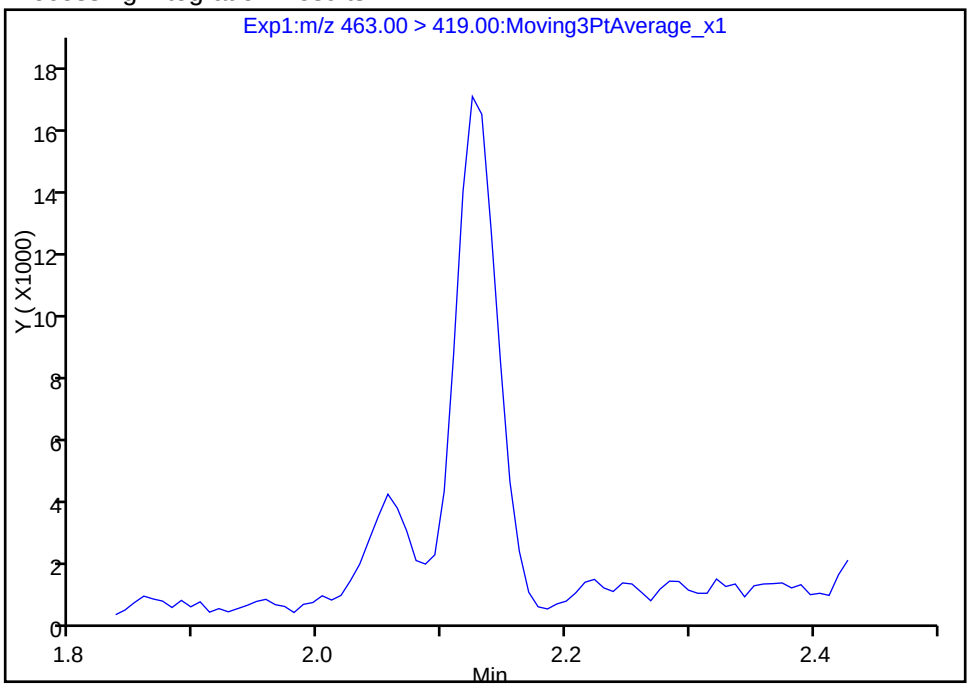
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_016.d				
Injection Date:	13-Nov-2017 03:33:20	Instrument ID:	A8_N		
Lims ID:	320-33018-A-7-A	Lab Sample ID:	320-33018-7		
Client ID:	NAWC-110217-RW-177-SHOP				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	10	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

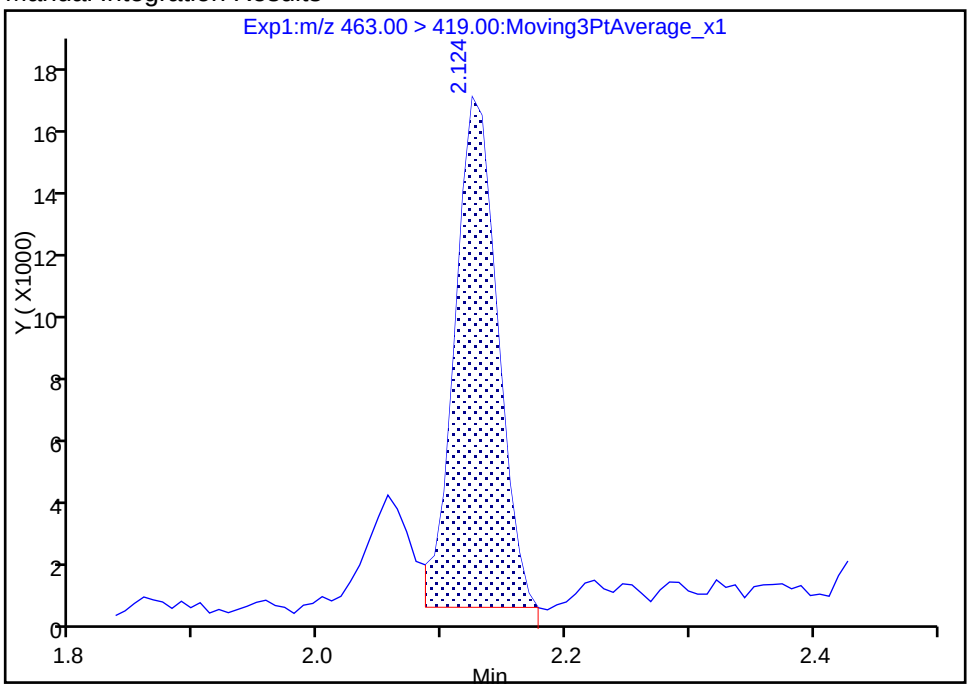
Not Detected
Expected RT: 2.16

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 37915
Amount: 0.343506
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:01:34
Audit Action: Manually Integrated Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-177-SHOP | Lab Sample ID: 320-33018-8

Matrix: Water | Lab File ID: 2017.11.13_537A_019.d

Analysis Method: 537 | Date Collected: 11/02/2017 09:15

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 251.1(mL) | Date Analyzed: 11/13/2017 03:47

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	84		70-130
STL00996	13C2 PFDA	87		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_019.d
Lims ID: 320-33018-A-8-A
Client ID: NAWC-110217-FRB-177-SHOP
Sample Type: Client
Inject. Date: 13-Nov-2017 03:47:22 ALS Bottle#: 11 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-8-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.563	1.573	-0.010	1.000	1516273	8.37		6863	
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.913	-0.024		1645574	10.0		5951	
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.151	-0.027		3338627	28.7		5104	
$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.312	-0.021	1.000	1096819	8.71		6690	

Report Date: 14-Nov-2017 17:12:09 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_019.d

Injection Date: 13-Nov-2017 03:47:22 Instrument ID: A8_N

Lims ID: 320-33018-A-8-A Lab Sample ID: 320-33018-8

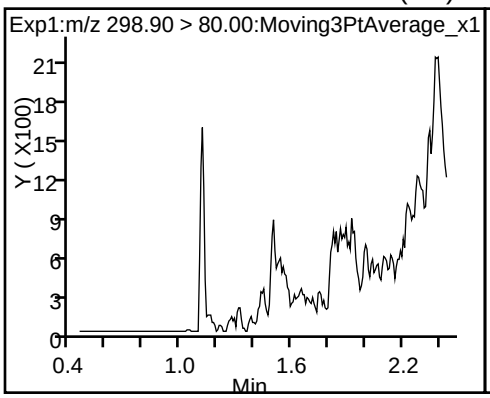
Client ID: NAWC-110217-FRB-177-SHOP

Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 16

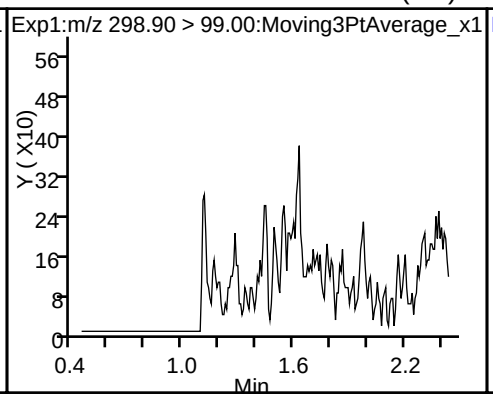
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

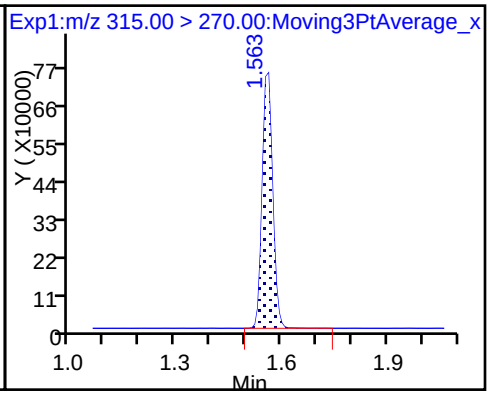
1 Perfluorobutanesulfonic acid (ND)



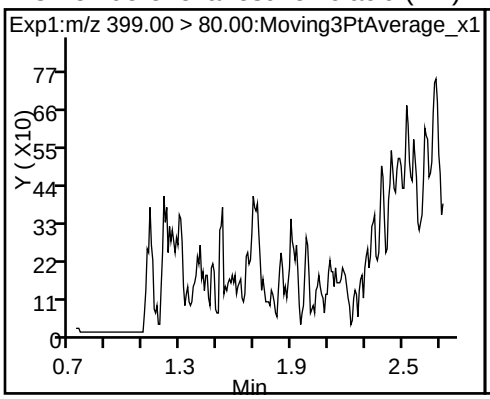
1 Perfluorobutanesulfonic acid (ND)



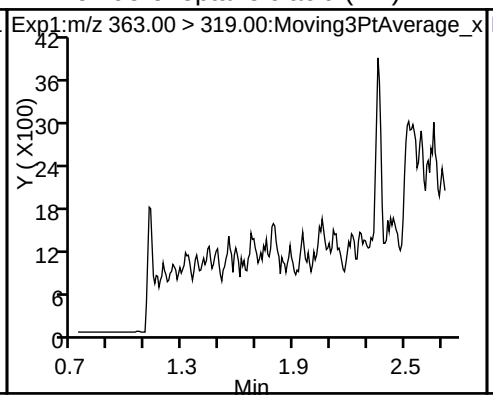
$ 2 13C2 PFHxA



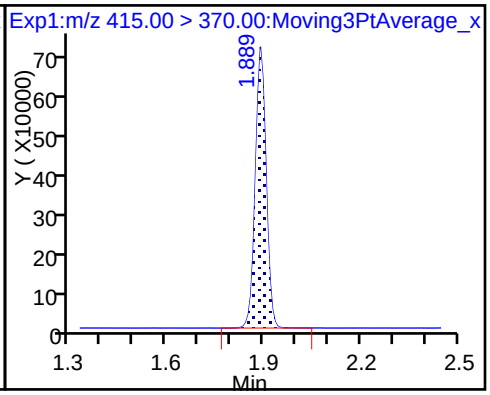
3 Perfluorohexanesulfonic acid (ND)



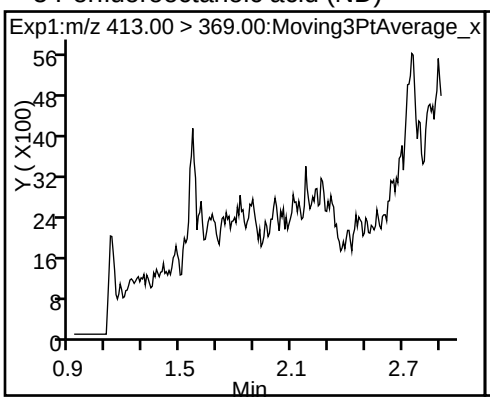
4 Perfluoroheptanoic acid (ND)



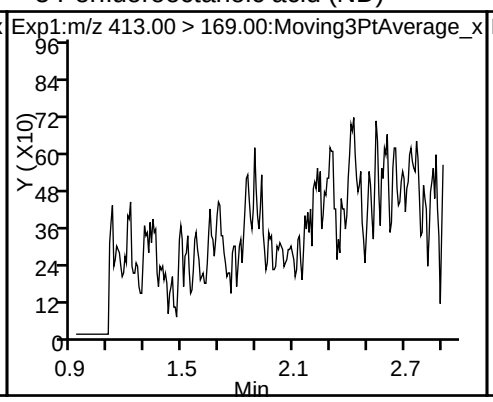
* 6 13C2-PFOA



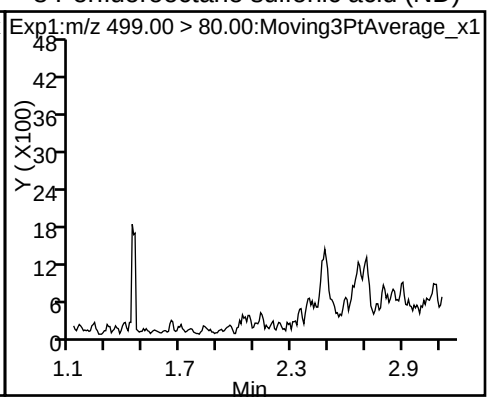
5 Perfluorooctanoic acid (ND)



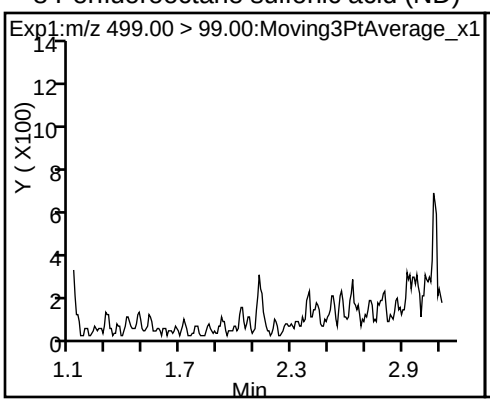
5 Perfluorooctanoic acid (ND)



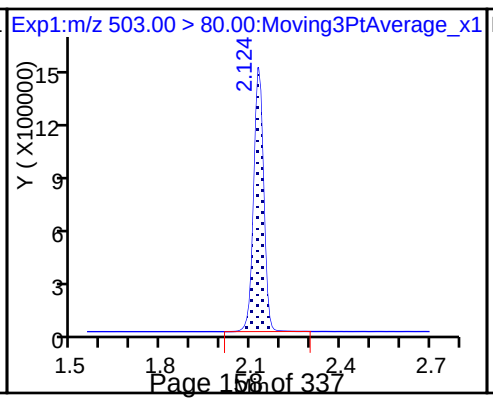
8 Perfluorooctane sulfonic acid (ND)



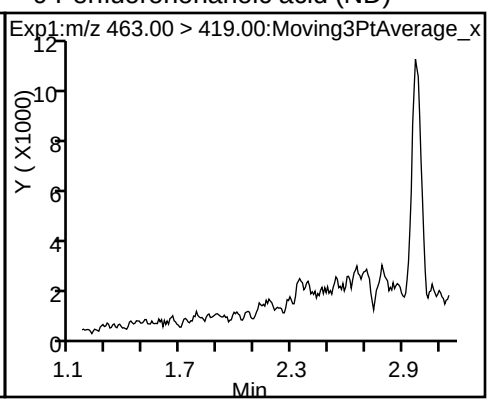
8 Perfluorooctane sulfonic acid (ND)



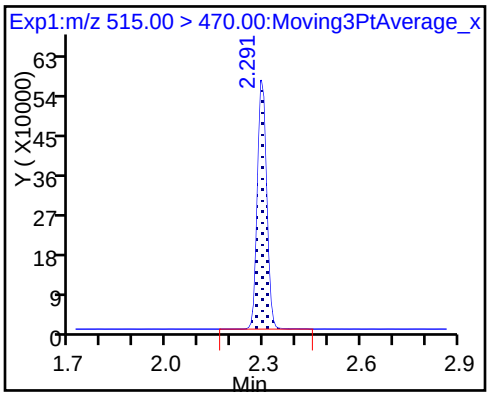
* 7 13C4 PFOS



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.291
Y (X10000)
63
54
45
36
27
18
9
0
1.7
2.0
2.3
2.6
2.9
Min

TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_019.d
Lims ID: 320-33018-A-8-A
Client ID: NAWC-110217-FRB-177-SHOP
Sample Type: Client
Inject. Date: 13-Nov-2017 03:47:22 ALS Bottle#: 11 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-8-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.37	83.74
$ 10 13C2 PFDA	10.0	8.71	87.10

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-185 | Lab Sample ID: 320-33018-9

Matrix: Water | Lab File ID: 2017.11.13_537A_020.d

Analysis Method: 537 | Date Collected: 11/02/2017 10:10

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 249.1(mL) | Date Analyzed: 11/13/2017 03:52

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	14	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	9.8	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	77		70-130
STL00996	13C2 PFDA	82		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_020.d
Lims ID: 320-33018-A-9-A
Client ID: NAWC-110217-RW-185
Sample Type: Client
Inject. Date: 13-Nov-2017 03:52:03 ALS Bottle#: 12 Worklist Smp#: 17
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-9-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 17:02:56

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.444	-0.018	1.000	154704	1.16		66.2	
298.90 > 99.00	1.426	1.444	-0.018	1.000	111520		1.39(0.00-0.00)	268	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.548	1.573	-0.025	1.000	1487946	7.73		6745	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.725	-0.026	1.000	506754	2.54		238	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.725	-0.026	1.000	400411	2.44		89.5	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.913	-0.031		1750127	10.0		7083	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.882	1.914	-0.032	1.000	557328	3.44		78.9	
413.00 > 169.00	1.882	1.914	-0.032	1.000	326581		1.71(0.00-0.00)	315	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.124	2.117	0.007	1.000	539121	4.82		251	
499.00 > 99.00	2.124	2.117	0.007	1.000	106775		5.05(0.00-0.00)	204	
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.151	-0.027		3418133	28.7		3119	
9 Perfluorononanoic acid									M
463.00 > 419.00	2.132	2.158	-0.026	1.000	76524	0.6583		18.8	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.312	-0.021	1.000	1101230	8.22		5787	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 14-Nov-2017 17:12:10 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_020.d

Injection Date: 13-Nov-2017 03:52:03 Instrument ID: A8_N

Lims ID: 320-33018-A-9-A Lab Sample ID: 320-33018-9

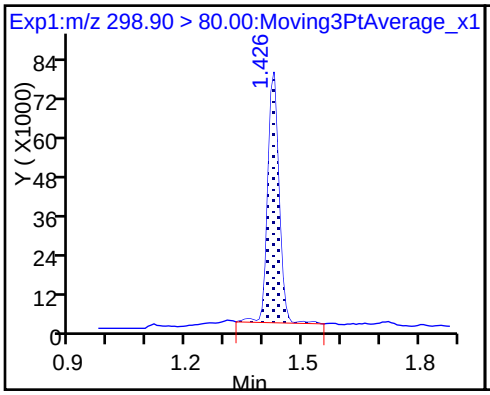
Client ID: NAWC-110217-RW-185

Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: 17

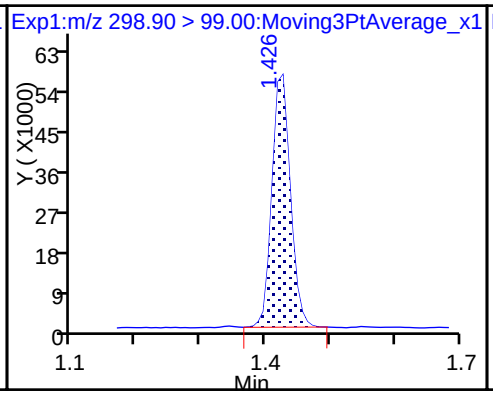
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

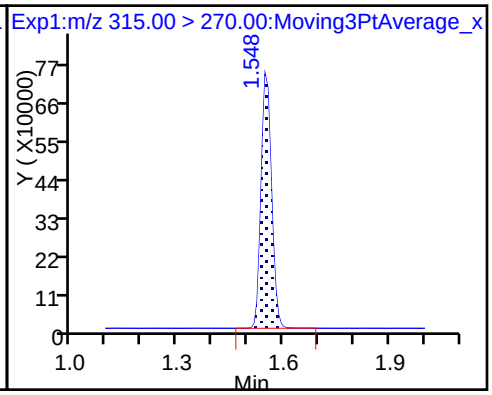
1 Perfluorobutanesulfonic acid



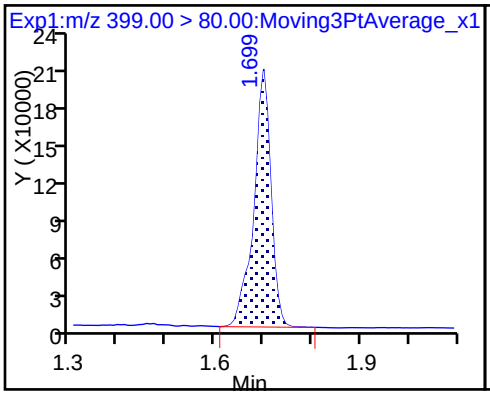
1 Perfluorobutanesulfonic acid



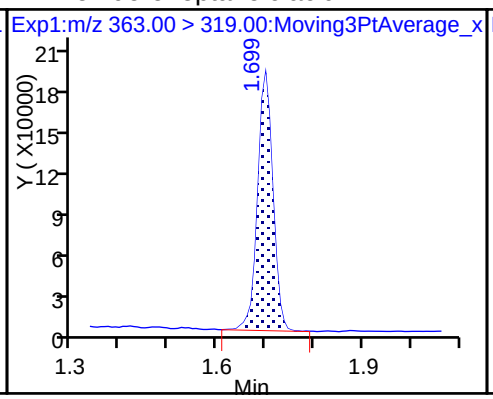
$ 2 13C2 PFHxA



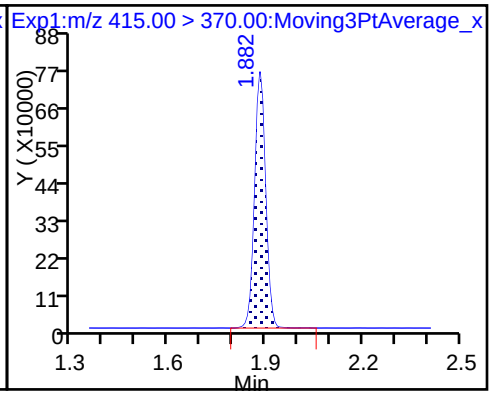
3 Perfluorohexanesulfonic acid



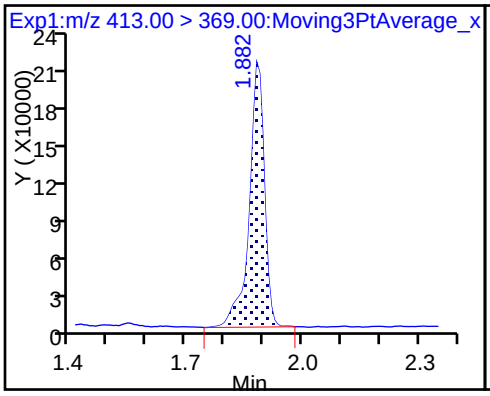
4 Perfluoroheptanoic acid



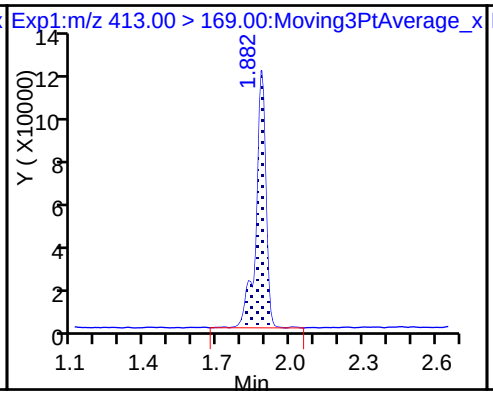
* 6 13C2-PFOA



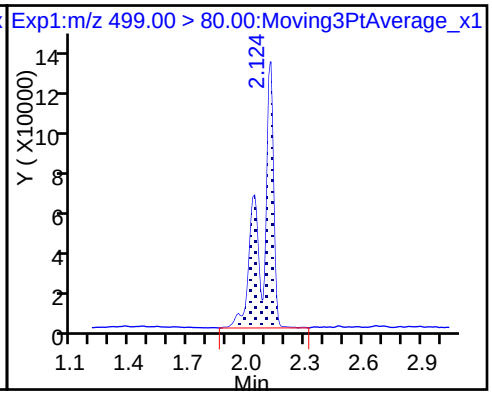
5 Perfluorooctanoic acid



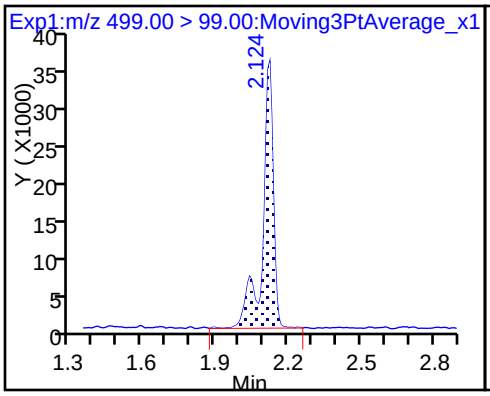
5 Perfluorooctanoic acid



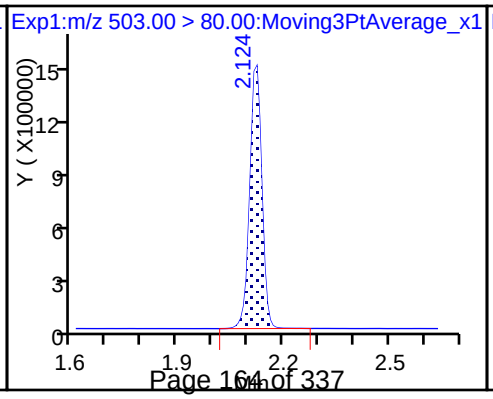
8 Perfluorooctane sulfonic acid



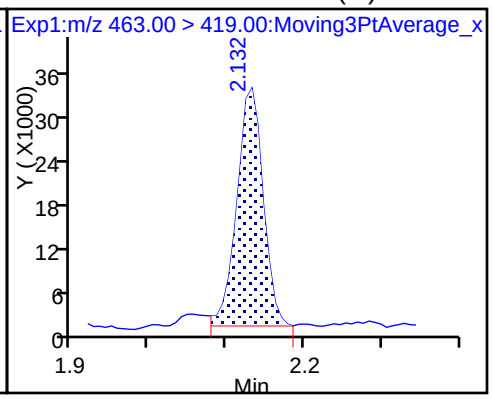
8 Perfluorooctane sulfonic acid



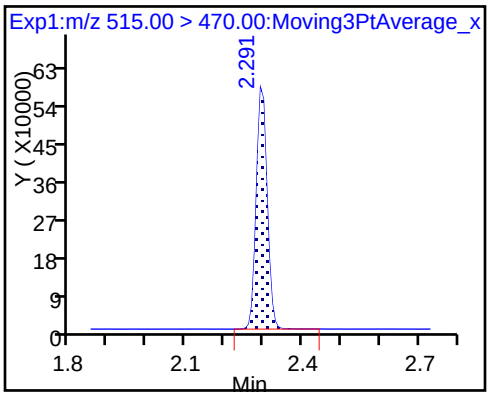
* 7 13C4 PFOS



9 Perfluorononanoic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.291
Y (X10000)
63
54
45
36
27
18
9
0
1.8
2.1
2.4
2.7
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_020.d				
Lims ID:	320-33018-A-9-A				
Client ID:	NAWC-110217-RW-185				
Sample Type:	Client				
Inject. Date:	13-Nov-2017 03:52:03	ALS Bottle#:	12	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-33018-a-9-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	14-Nov-2017 17:12:07	Calib Date:	03-Nov-2017 14:01:24		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK010				

First Level Reviewer: barnettj Date: 14-Nov-2017 17:02:56

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	7.73	77.27
$ 10 13C2 PFDA	10.0	8.22	82.23

TestAmerica Sacramento

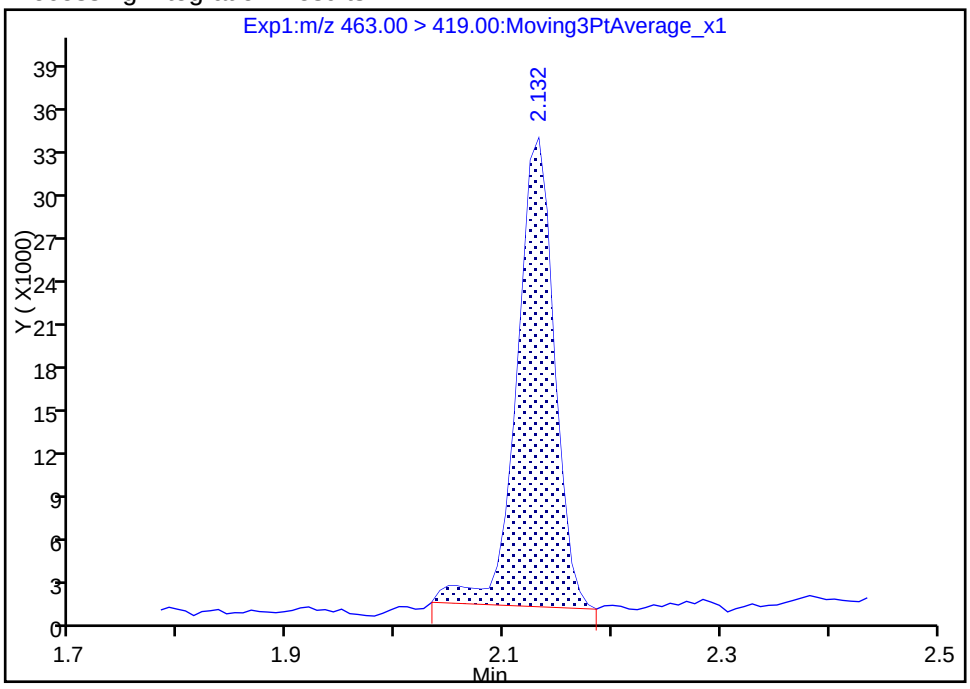
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_020.d				
Injection Date:	13-Nov-2017 03:52:03	Instrument ID:	A8_N		
Lims ID:	320-33018-A-9-A	Lab Sample ID:	320-33018-9		
Client ID:	NAWC-110217-RW-185				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	12	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

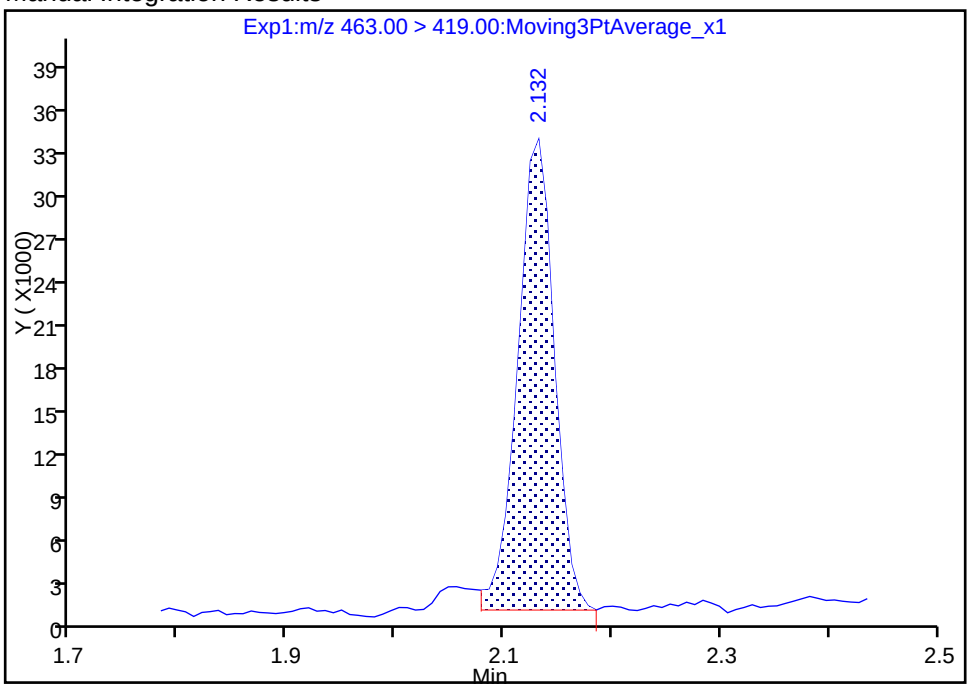
Processing Integration Results

RT: 2.13
Area: 78153
Amount: 0.672362
Amount Units: ng/ml



Manual Integration Results

RT: 2.13
Area: 76524
Amount: 0.658347
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:02:50
Audit Action: Manually Integrated Audit Reason: Split Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-185 | Lab Sample ID: 320-33018-10

Matrix: Water | Lab File ID: 2017.11.13_537A_021.d

Analysis Method: 537 | Date Collected: 11/02/2017 10:05

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 250.6(mL) | Date Analyzed: 11/13/2017 03:56

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	88		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_021.d
Lims ID: 320-33018-A-10-A
Client ID: NAWC-110217-FRB-185
Sample Type: Client
Inject. Date: 13-Nov-2017 03:56:44 ALS Bottle#: 13 Worklist Smp#: 18
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-10-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1580634	8.67		7432	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.913	-0.031		1656481	10.0		6355	
* 7 13C4 PFOS									
503.00 > 80.00	2.117	2.151	-0.034		3242885	28.7		4759	
$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.312	-0.021	1.000	1117298	8.81		7783	

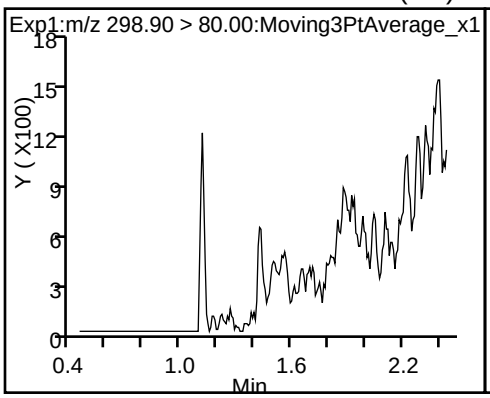
Report Date: 14-Nov-2017 17:12:11 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

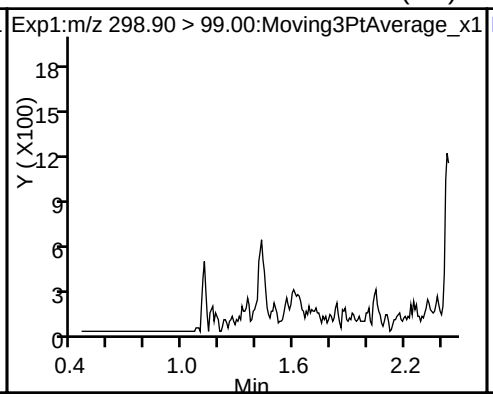
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_021.d

Injection Date:	13-Nov-2017 03:56:44	Instrument ID:	A8_N		
Lims ID:	320-33018-A-10-A	Lab Sample ID:	320-33018-10		
Client ID:	NAWC-110217-FRB-185				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	13	Worklist Smp#:	18
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

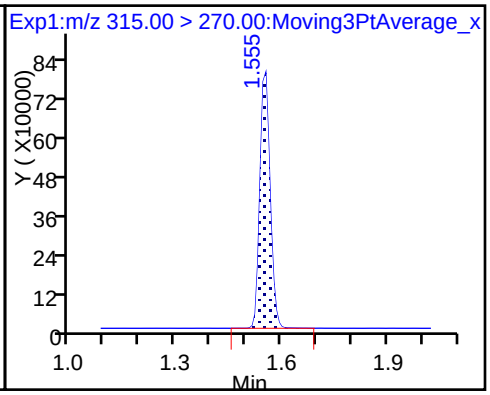
1 Perfluorobutanesulfonic acid (ND)



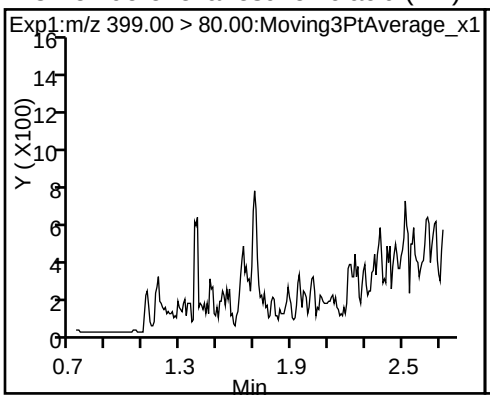
1 Perfluorobutanesulfonic acid (ND)



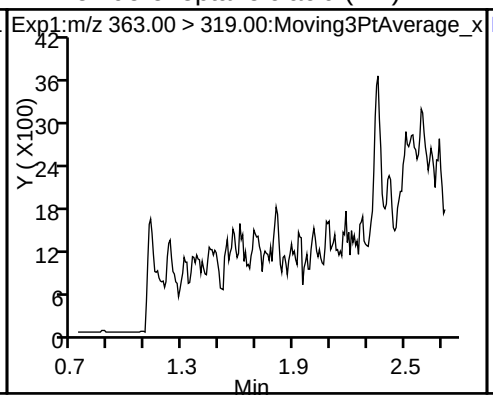
$ 2 13C2 PFHxA



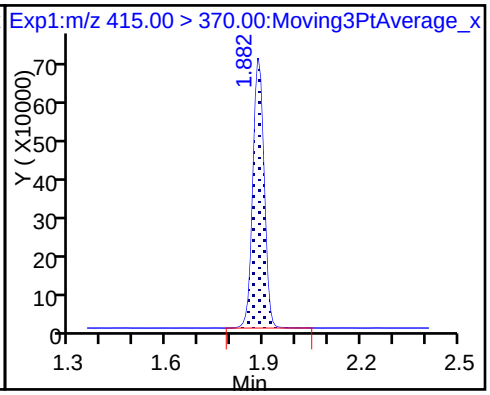
3 Perfluorohexanesulfonic acid (ND)



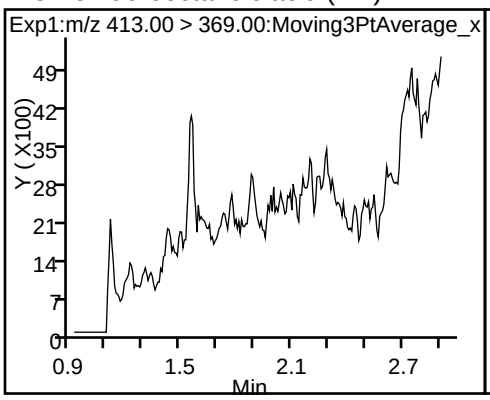
4 Perfluoroheptanoic acid (ND)



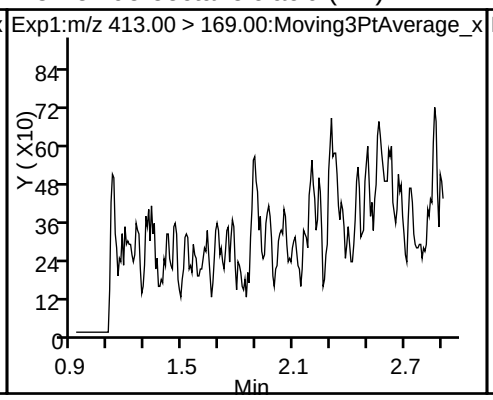
* 6 13C2-PFOA



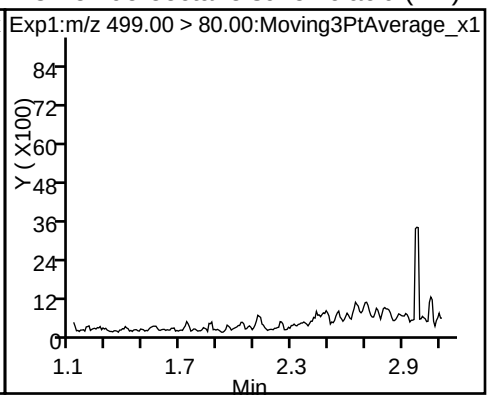
5 Perfluorooctanoic acid (ND)



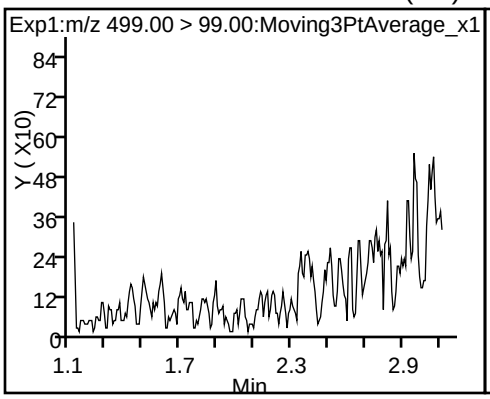
5 Perfluorooctanoic acid (ND)



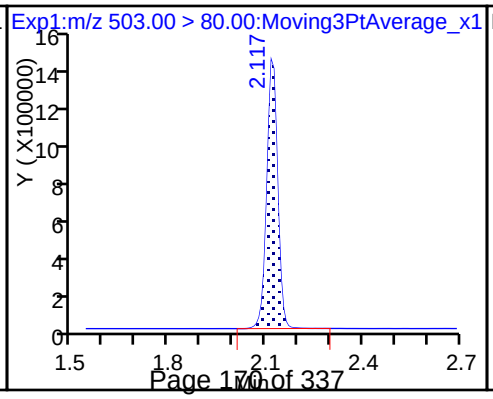
8 Perfluorooctane sulfonic acid (ND)



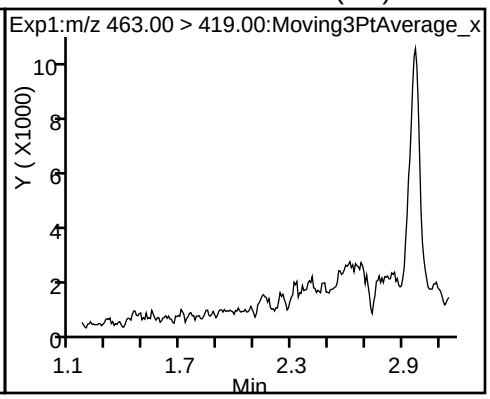
8 Perfluorooctane sulfonic acid (ND)



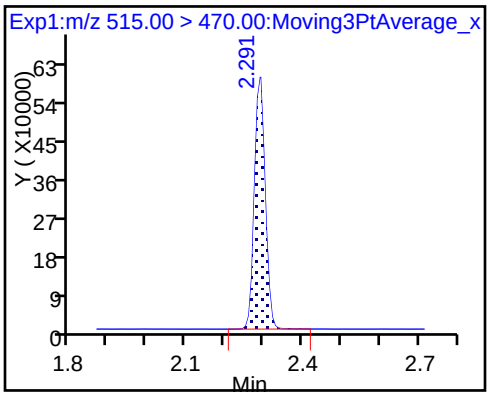
* 7 13C4 PFOS



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.291
Y (X10000)
63
54
45
36
27
18
9
0
1.8
2.1
2.4
2.7
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_021.d				
Lims ID:	320-33018-A-10-A				
Client ID:	NAWC-110217-FRB-185				
Sample Type:	Client				
Inject. Date:	13-Nov-2017 03:56:44	ALS Bottle#:	13	Worklist Smp#:	18
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-33018-a-10-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	14-Nov-2017 17:12:07	Calib Date:	03-Nov-2017 14:01:24		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK010				

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.67	86.72
$ 10 13C2 PFDA	10.0	8.81	88.15

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-355 | Lab Sample ID: 320-33018-11

Matrix: Water | Lab File ID: 2017.11.13_537A_022.d

Analysis Method: 537 | Date Collected: 11/02/2017 10:40

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 249.3(mL) | Date Analyzed: 11/13/2017 04:01

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.2	J	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	7.8	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.1	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.3	J M	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	77		70-130
STL00996	13C2 PFDA	82		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_022.d
Lims ID: 320-33018-A-11-A
Client ID: NAWC-110217-RW-355
Sample Type: Client
Inject. Date: 13-Nov-2017 04:01:26 ALS Bottle#: 14 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-11-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 17:03:52

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.434	1.444	-0.010	1.000	85082	0.6633		41.3	
298.90 > 99.00	1.434	1.444	-0.010	1.000	60623		1.40(0.00-0.00)	134	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1473214	7.67		5959	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.707	1.725	-0.018	1.000	293432	1.53		182	
4 Perfluoroheptanoic acid									M
363.00 > 319.00	1.707	1.725	-0.018	1.000	92696	0.5669		20.1	M
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.913	-0.024		1745240	10.0		6788	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.889	1.914	-0.025	1.000	316061	1.96		46.4	
413.00 > 169.00	1.889	1.914	-0.025	1.000	197231		1.60(0.00-0.00)	162	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.124	2.117	0.007	1.000	248048	2.30		107	
499.00 > 99.00	2.124	2.117	0.007	1.000	48074		5.16(0.00-0.00)	96.7	
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.151	-0.027		3289792	28.7		3734	
9 Perfluorononanoic acid									M
463.00 > 419.00	2.132	2.158	-0.026	1.000	30838	0.2660		7.7	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.312	-0.021	1.000	1091759	8.18		7962	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 14-Nov-2017 17:12:11 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_022.d

Injection Date: 13-Nov-2017 04:01:26 Instrument ID: A8_N

Lims ID: 320-33018-A-11-A Lab Sample ID: 320-33018-11

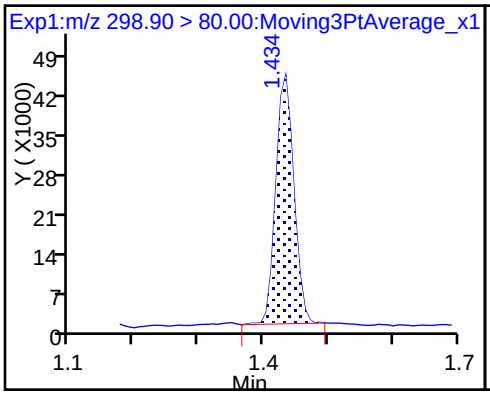
Client ID: NAWC-110217-RW-355

Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 19

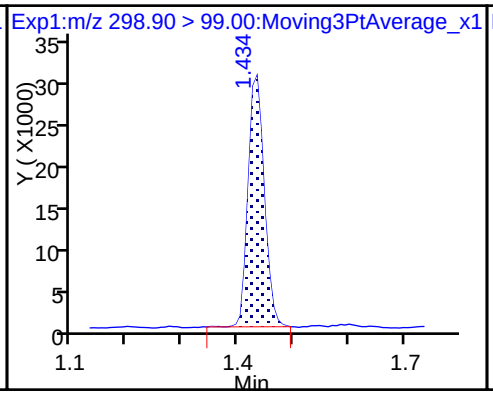
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

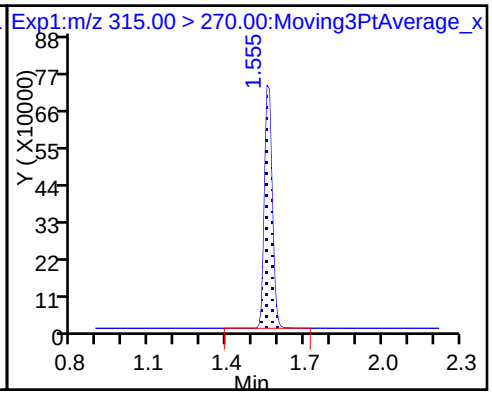
1 Perfluorobutanesulfonic acid



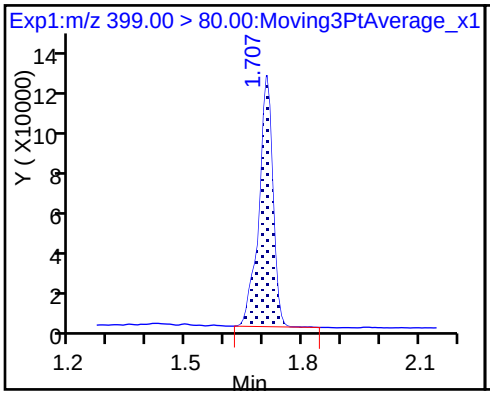
1 Perfluorobutanesulfonic acid



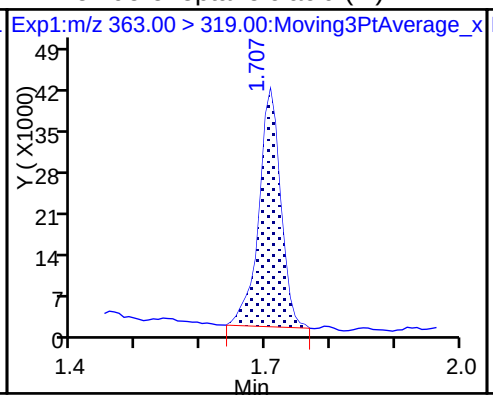
$ 2 13C2 PFHxA



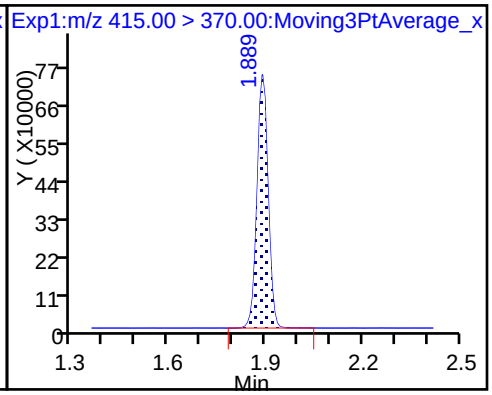
3 Perfluorohexanesulfonic acid



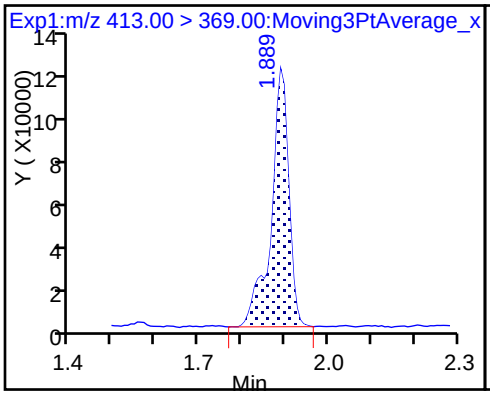
4 Perfluoroheptanoic acid (M)



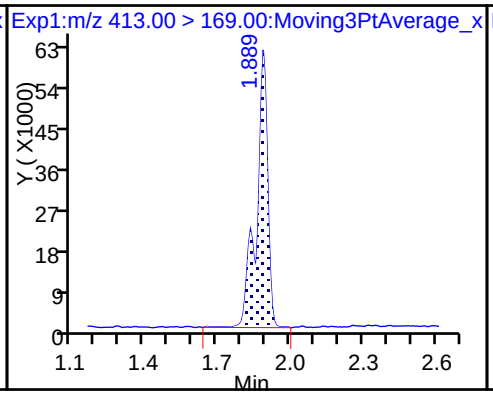
* 6 13C2-PFOA



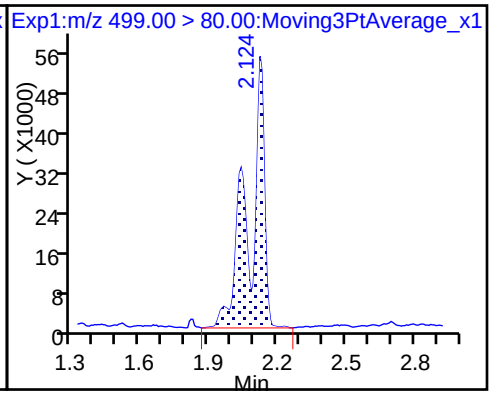
5 Perfluorooctanoic acid



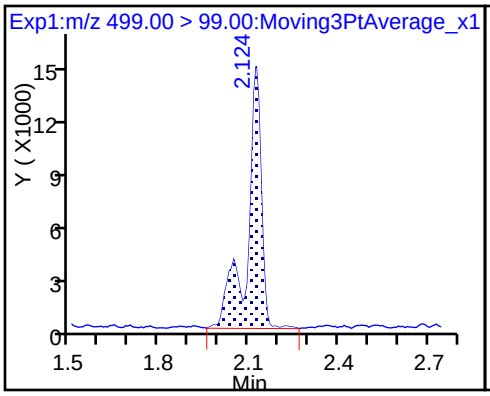
5 Perfluorooctanoic acid



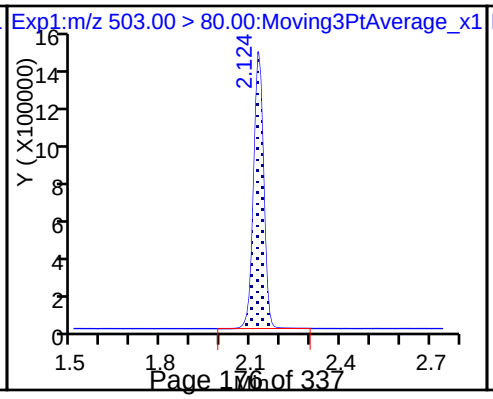
8 Perfluorooctane sulfonic acid



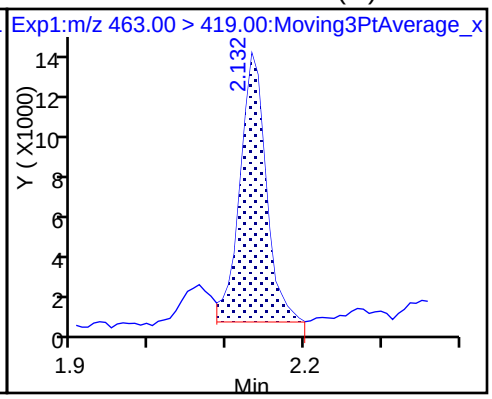
8 Perfluorooctane sulfonic acid



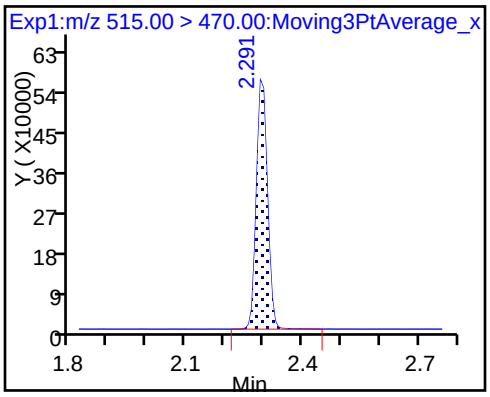
* 7 13C4 PFOS



9 Perfluorononanoic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.291
Y (X10000)
63
54
45
36
27
18
9
0
1.8
2.1
2.4
2.7
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_022.d				
Lims ID:	320-33018-A-11-A				
Client ID:	NAWC-110217-RW-355				
Sample Type:	Client				
Inject. Date:	13-Nov-2017 04:01:26	ALS Bottle#:	14	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-33018-a-11-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	14-Nov-2017 17:12:07	Calib Date:	03-Nov-2017 14:01:24		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK010				

First Level Reviewer: barnettj Date: 14-Nov-2017 17:03:52

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	7.67	76.72
$ 10 13C2 PFDA	10.0	8.18	81.75

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

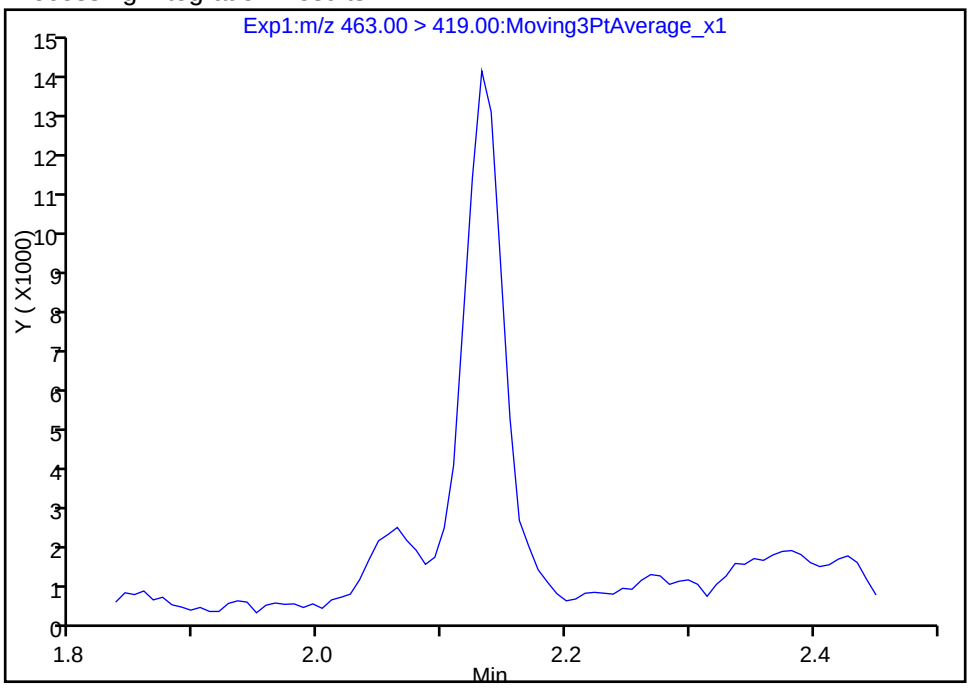
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_022.d				
Injection Date:	13-Nov-2017 04:01:26	Instrument ID:	A8_N		
Lims ID:	320-33018-A-11-A	Lab Sample ID:	320-33018-11		
Client ID:	NAWC-110217-RW-355				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	14	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

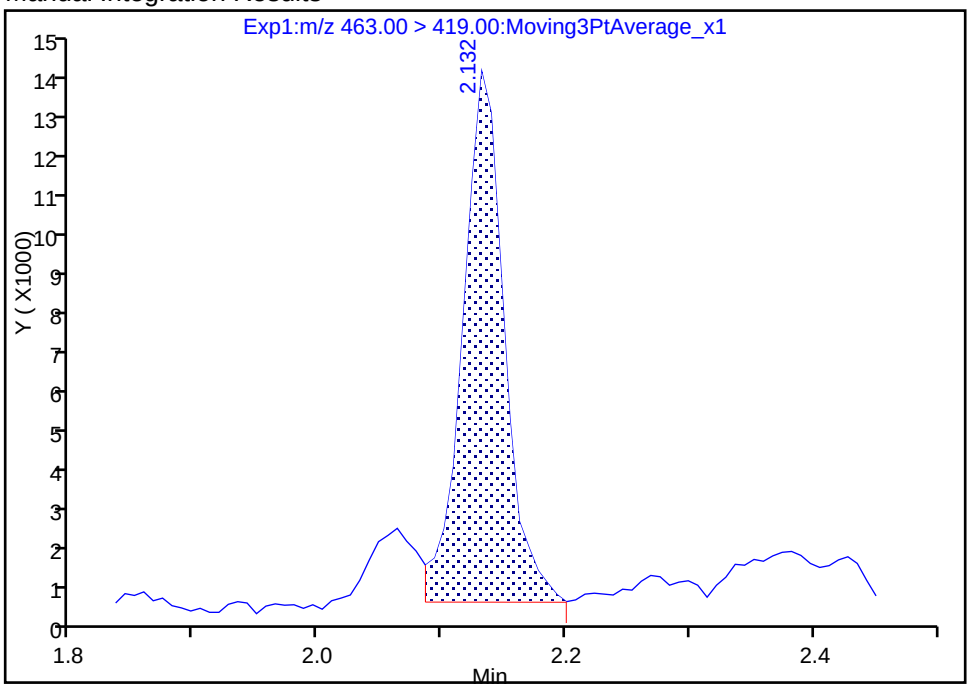
Not Detected
Expected RT: 2.16

Processing Integration Results



Manual Integration Results

RT: 2.13
Area: 30838
Amount: 0.266047
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:03:46
Audit Action: Manually Integrated Audit Reason: Missed Peak

TestAmerica Sacramento

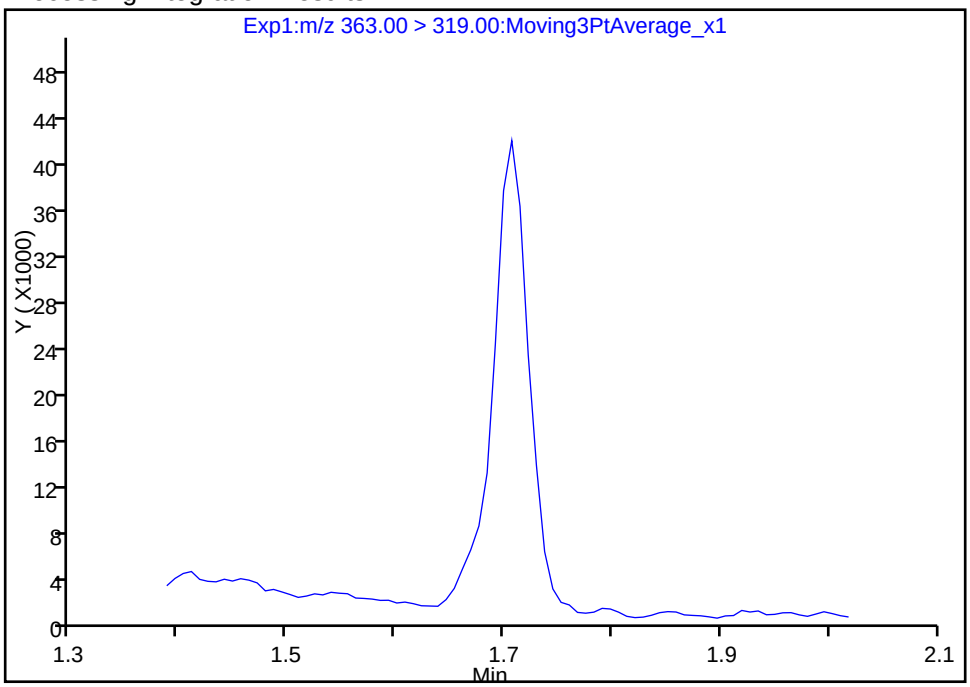
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_022.d				
Injection Date:	13-Nov-2017 04:01:26	Instrument ID:	A8_N		
Lims ID:	320-33018-A-11-A	Lab Sample ID:	320-33018-11		
Client ID:	NAWC-110217-RW-355				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	14	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

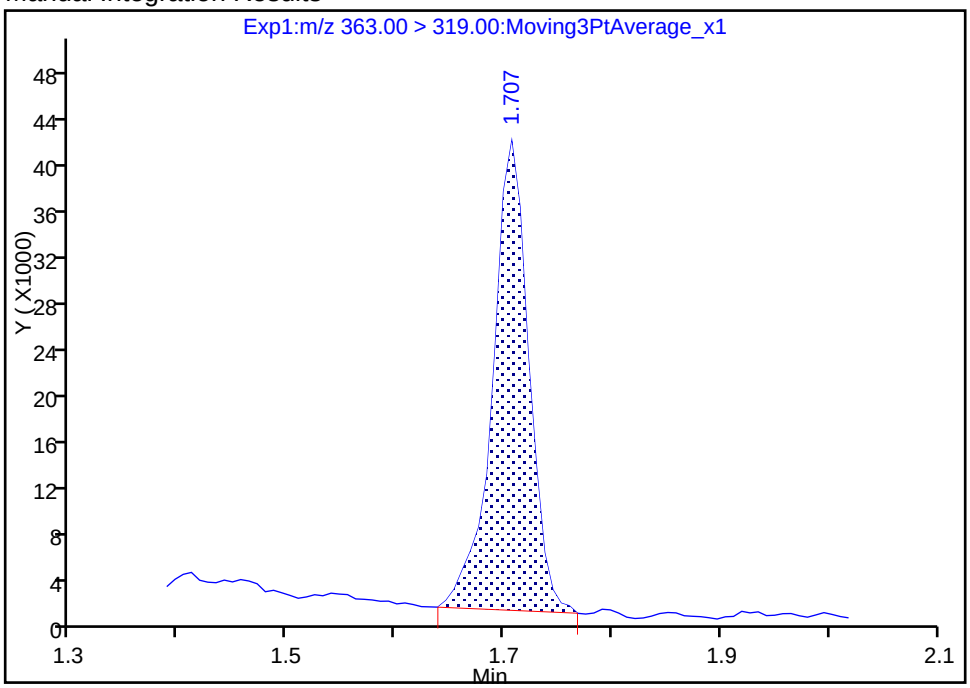
Not Detected
Expected RT: 1.72

Processing Integration Results



Manual Integration Results

RT: 1.71
Area: 92696
Amount: 0.566899
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:03:20
Audit Action: Manually Integrated Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-355 | Lab Sample ID: 320-33018-12

Matrix: Water | Lab File ID: 2017.11.13_537A_023.d

Analysis Method: 537 | Date Collected: 11/02/2017 10:35

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 245.2(mL) | Date Analyzed: 11/13/2017 04:06

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.2	U	20	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	89		70-130
STL00996	13C2 PFDA	82		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_023.d
Lims ID: 320-33018-A-12-A
Client ID: NAWC-110217-FRB-355
Sample Type: Client
Inject. Date: 13-Nov-2017 04:06:08 ALS Bottle#: 15 Worklist Smp#: 20
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-12-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1562831	8.93		6802	
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.913	-0.024		1590556	10.0		6678	
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.151	-0.027		3142325	28.7		3840	
$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.312	-0.021	1.000	1000195	8.22		5984	

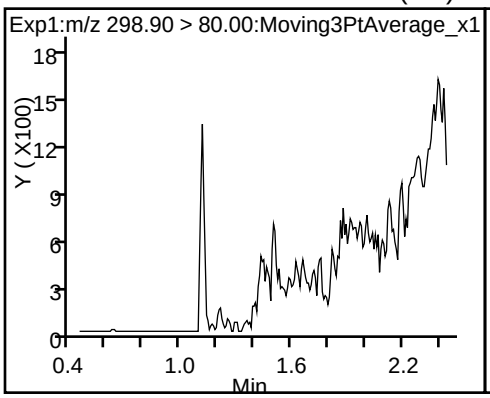
Report Date: 14-Nov-2017 17:12:12 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

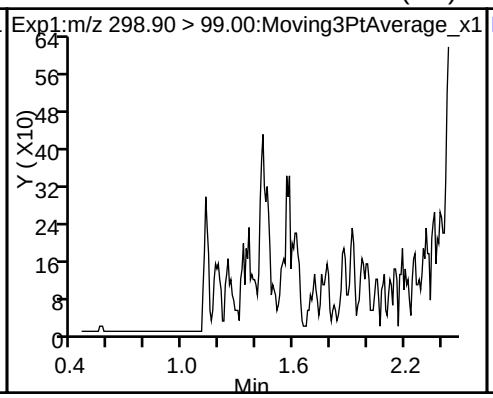
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_023.d

Injection Date:	13-Nov-2017 04:06:08	Instrument ID:	A8_N		
Lims ID:	320-33018-A-12-A	Lab Sample ID:	320-33018-12		
Client ID:	NAWC-110217-FRB-355				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	15	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

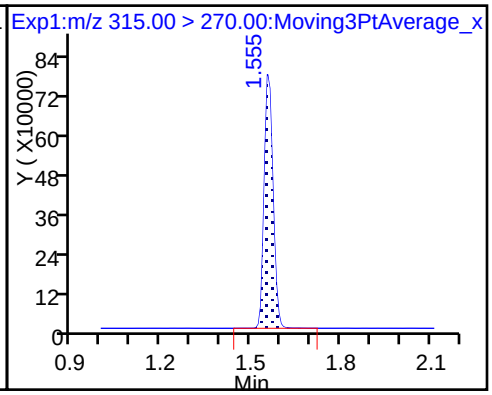
1 Perfluorobutanesulfonic acid (ND)



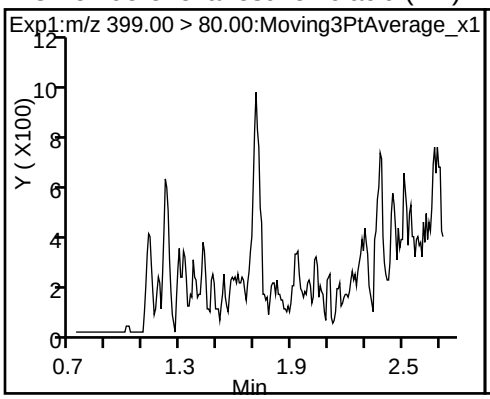
1 Perfluorobutanesulfonic acid (ND)



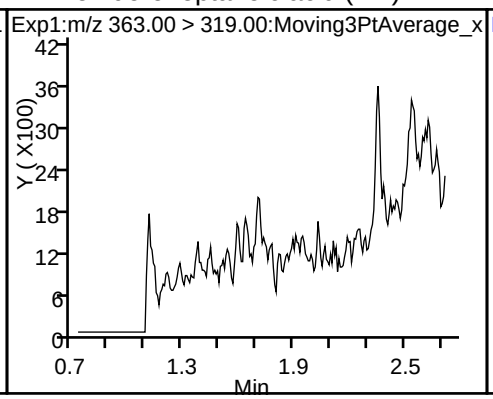
$ 2 13C2 PFHxA



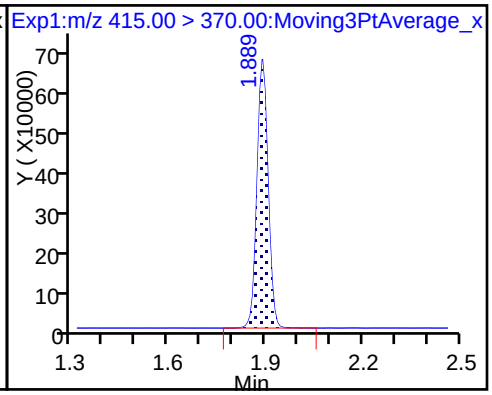
3 Perfluorohexanesulfonic acid (ND)



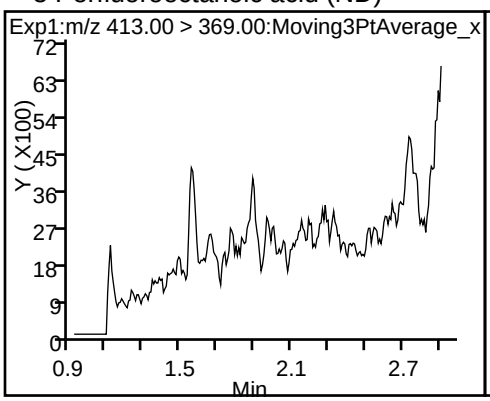
4 Perfluoroheptanoic acid (ND)



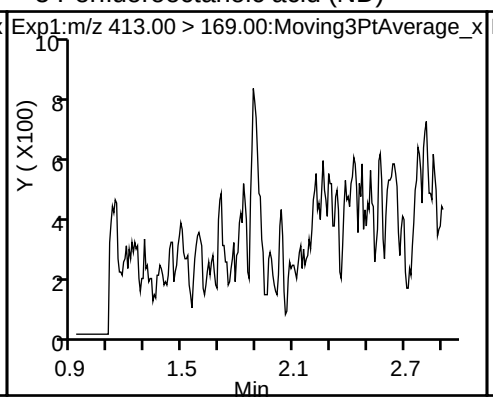
* 6 13C2-PFOA



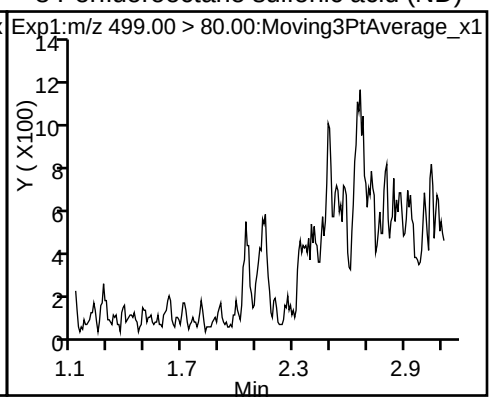
5 Perfluorooctanoic acid (ND)



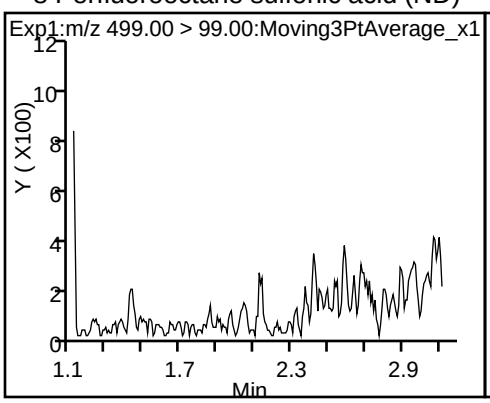
5 Perfluorooctanoic acid (ND)



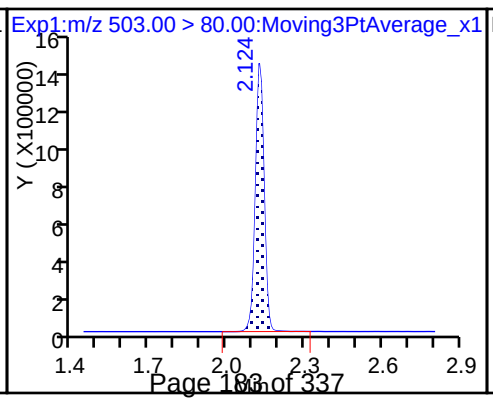
8 Perfluorooctane sulfonic acid (ND)



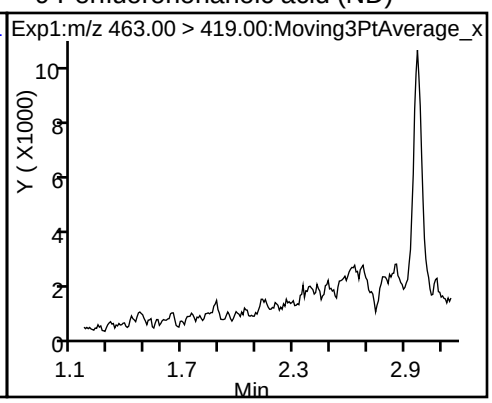
8 Perfluorooctane sulfonic acid (ND)



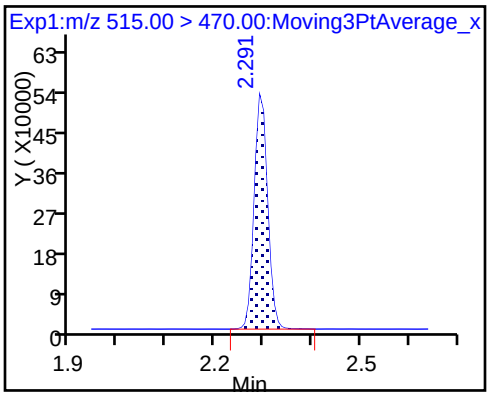
* 7 13C4 PFOS



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.291
Y (X10000)
63
54
45
36
27
18
9
0
1.9
2.2
2.5
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_023.d				
Lims ID:	320-33018-A-12-A				
Client ID:	NAWC-110217-FRB-355				
Sample Type:	Client				
Inject. Date:	13-Nov-2017 04:06:08	ALS Bottle#:	15	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-33018-a-12-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	14-Nov-2017 17:12:07	Calib Date:	03-Nov-2017 14:01:24		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK010				

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.93	89.30
$ 10 13C2 PFDA	10.0	8.22	82.18

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-348 | Lab Sample ID: 320-33018-13

Matrix: Water | Lab File ID: 2017.11.13_537A_024.d

Analysis Method: 537 | Date Collected: 11/02/2017 11:40

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 250.3(mL) | Date Analyzed: 11/13/2017 04:10

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	33	J	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	19	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.7	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	82		70-130
STL00996	13C2 PFDA	83		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_024.d
Lims ID: 320-33018-A-13-A
Client ID: NAWC-110217-RW-348
Sample Type: Client
Inject. Date: 13-Nov-2017 04:10:48 ALS Bottle#: 16 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-13-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 17:04:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.444	-0.018	1.000	227231	1.78		80.2	
298.90 > 99.00	1.426	1.444	-0.018	1.000	152842		1.49(0.00-0.00)	346	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1590765	8.16		6839	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.725	-0.026	1.000	483969	2.53		207	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.725	-0.026	1.000	194040	1.17		41.5	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.913	-0.031		1771725	10.0		7200	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.882	1.914	-0.032	1.000	769129	4.69		119	
413.00 > 169.00	1.882	1.914	-0.032	1.000	432469		1.78(0.00-0.00)	406	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.117	2.117	0.0	1.000	883147	8.22		329	
499.00 > 99.00	2.117	2.117	0.0	1.000	184838		4.78(0.00-0.00)	352	
* 7 13C4 PFOS									
503.00 > 80.00	2.117	2.151	-0.034		3280139	28.7		2448	
9 Perfluorononanoic acid									M
463.00 > 419.00	2.124	2.158	-0.034	1.000	69436	0.5901		16.1	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.312	-0.021	1.000	1123974	8.29		8865	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 14-Nov-2017 17:12:13 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_024.d

Injection Date: 13-Nov-2017 04:10:48 Instrument ID: A8_N

Lims ID: 320-33018-A-13-A Lab Sample ID: 320-33018-13

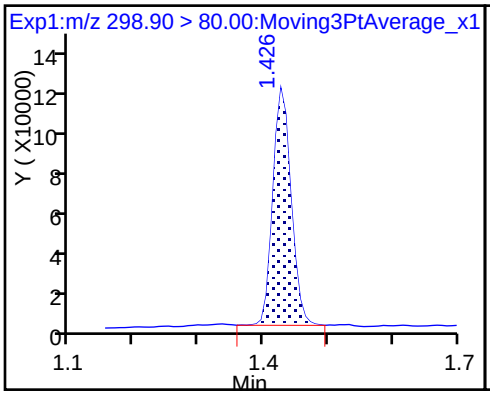
Client ID: NAWC-110217-RW-348

Operator ID: SACINSTLCMS01 ALS Bottle#: 16 Worklist Smp#: 21

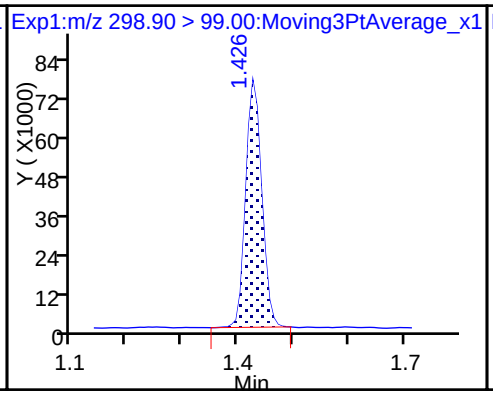
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

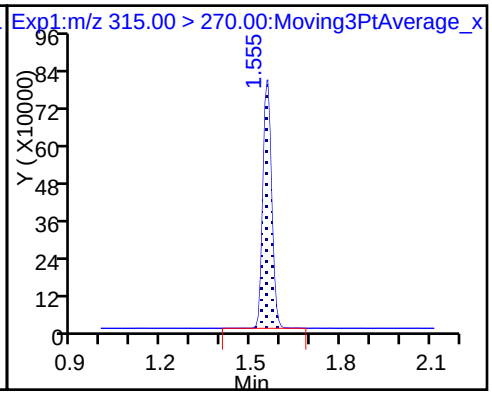
1 Perfluorobutanesulfonic acid



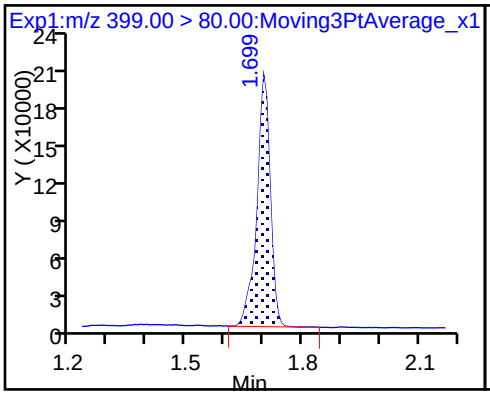
1 Perfluorobutanesulfonic acid



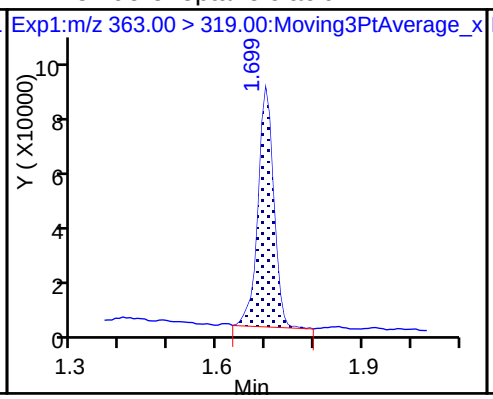
$ 2 13C2 PFHxA



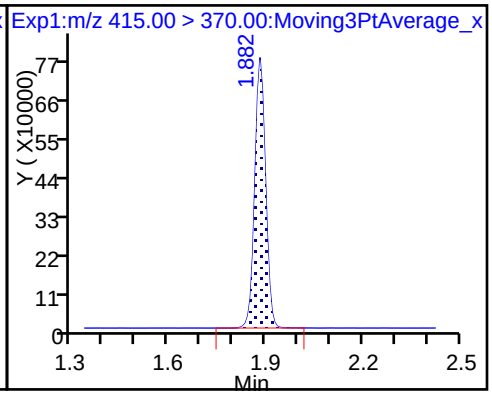
3 Perfluorohexanesulfonic acid



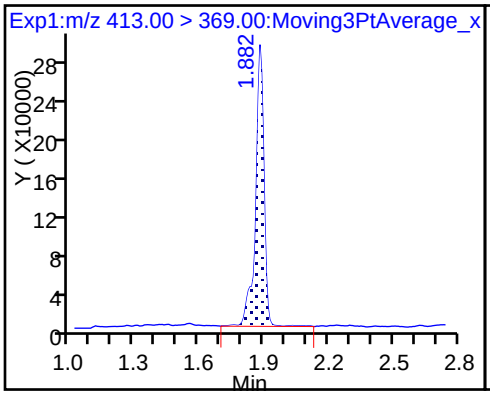
4 Perfluoroheptanoic acid



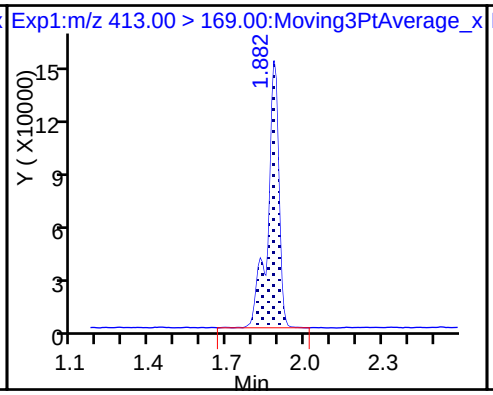
* 6 13C2-PFOA



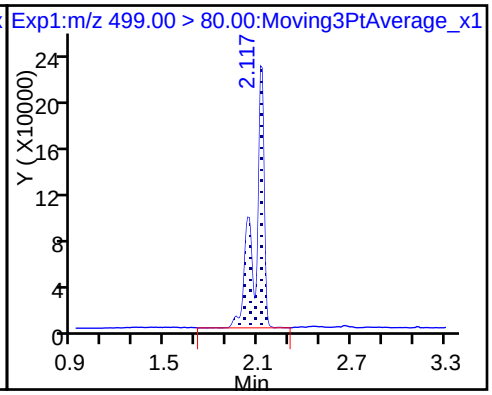
5 Perfluorooctanoic acid



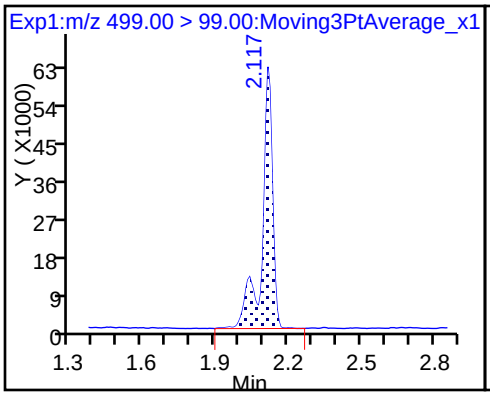
5 Perfluorooctanoic acid



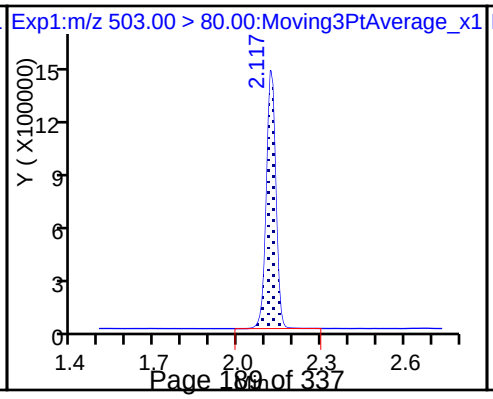
8 Perfluorooctane sulfonic acid



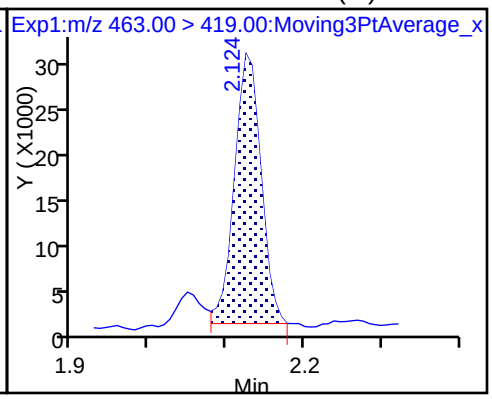
8 Perfluorooctane sulfonic acid



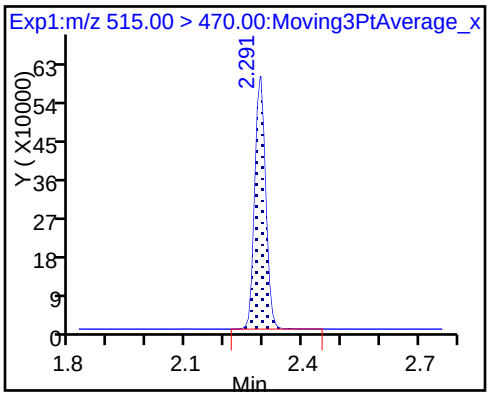
* 7 13C4 PFOS



9 Perfluorononanoic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.291
Y (X10000)
63
54
45
36
27
18
9
0
1.8
2.1
2.4
2.7
Min

Report Date: 14-Nov-2017 17:12:13 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_024.d				
Lims ID:	320-33018-A-13-A				
Client ID:	NAWC-110217-RW-348				
Sample Type:	Client				
Inject. Date:	13-Nov-2017 04:10:48	ALS Bottle#:	16	Worklist Smp#:	21
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-33018-a-13-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	14-Nov-2017 17:12:07	Calib Date:	03-Nov-2017 14:01:24		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK010				
First Level Reviewer: barnettj		Date:	14-Nov-2017 17:04:36		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.16	81.60
$ 10 13C2 PFDA	10.0	8.29	82.91

TestAmerica Sacramento

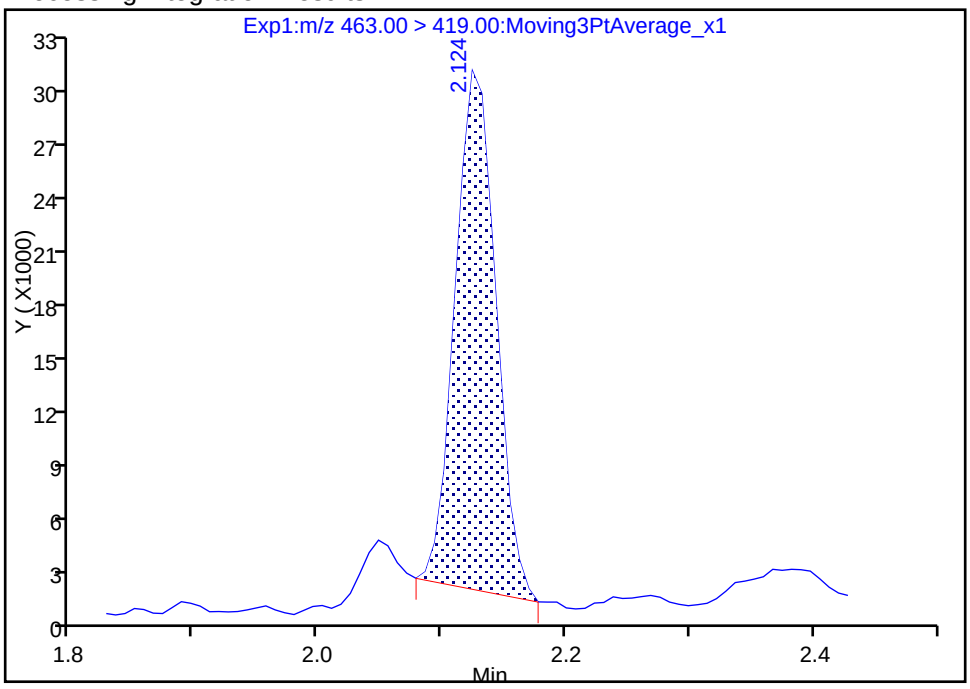
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_024.d				
Injection Date:	13-Nov-2017 04:10:48	Instrument ID:	A8_N		
Lims ID:	320-33018-A-13-A	Lab Sample ID:	320-33018-13		
Client ID:	NAWC-110217-RW-348				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	16	Worklist Smp#:	21
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

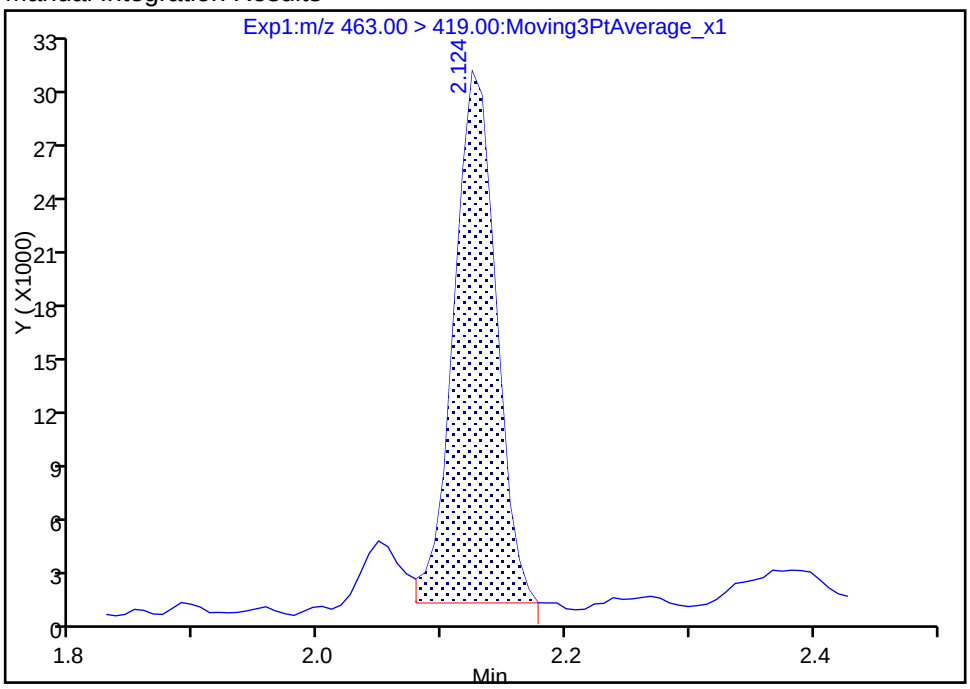
Processing Integration Results

RT: 2.12
Area: 65557
Amount: 0.557121
Amount Units: ng/ml



Manual Integration Results

RT: 2.12
Area: 69436
Amount: 0.590086
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:04:27
Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-348 | Lab Sample ID: 320-33018-14

Matrix: Water | Lab File ID: 2017.11.13_537A_025.d

Analysis Method: 537 | Date Collected: 11/02/2017 11:35

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 252.5(mL) | Date Analyzed: 11/13/2017 04:15

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	88		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_025.d
Lims ID: 320-33018-A-14-A
Client ID: NAWC-110217-FRB-348
Sample Type: Client
Inject. Date: 13-Nov-2017 04:15:29 ALS Bottle#: 17 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-14-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1608061	9.01		7554	
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.913	-0.024		1622165	10.0		6630	
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.151	-0.027		3163206	28.7		4379	
$ 10 13C2 PFDA									
515.00 > 470.00	2.299	2.312	-0.013	1.000	1097610	8.84		7689	

Report Date: 14-Nov-2017 17:12:13 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_025.d

Injection Date: 13-Nov-2017 04:15:29 Instrument ID: A8_N

Lims ID: 320-33018-A-14-A Lab Sample ID: 320-33018-14

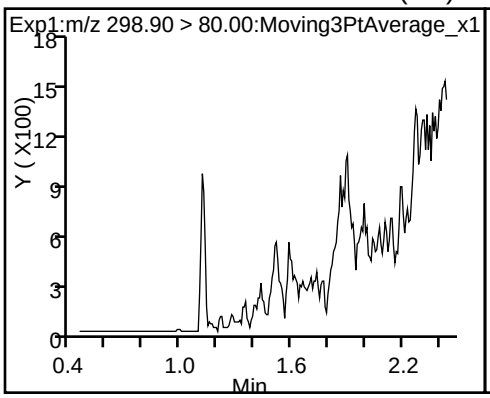
Client ID: NAWC-110217-FRB-348

Operator ID: SACINSTLCMS01 ALS Bottle#: 17 Worklist Smp#: 22

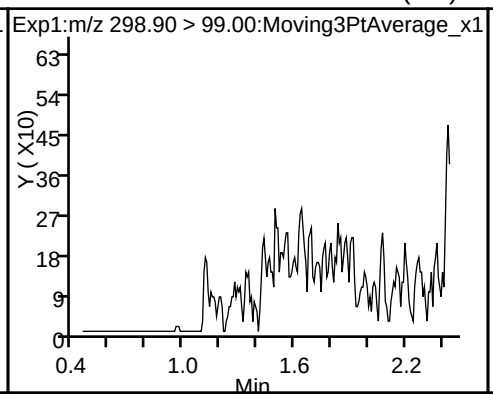
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

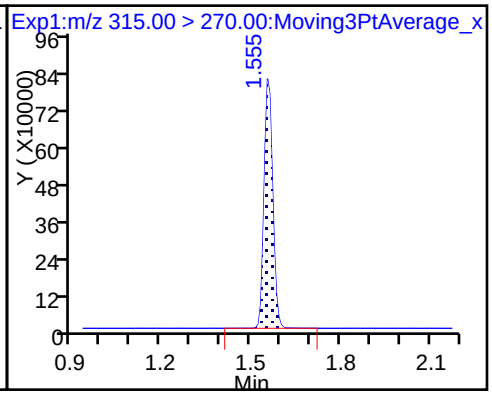
1 Perfluorobutanesulfonic acid (ND)



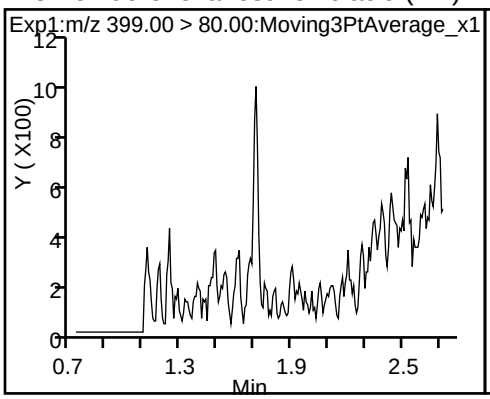
1 Perfluorobutanesulfonic acid (ND)



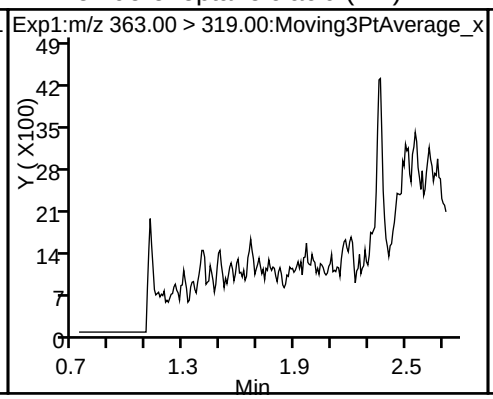
$ 2 13C2 PFHxA



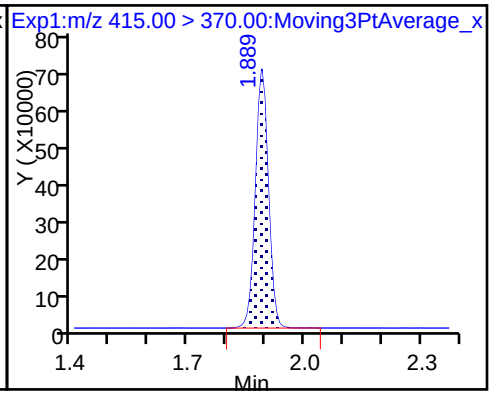
3 Perfluorohexanesulfonic acid (ND)



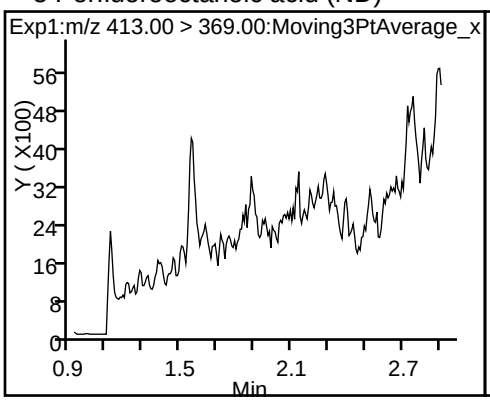
4 Perfluoroheptanoic acid (ND)



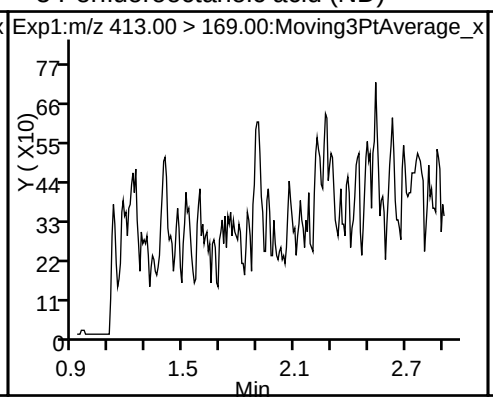
* 6 13C2-PFOA



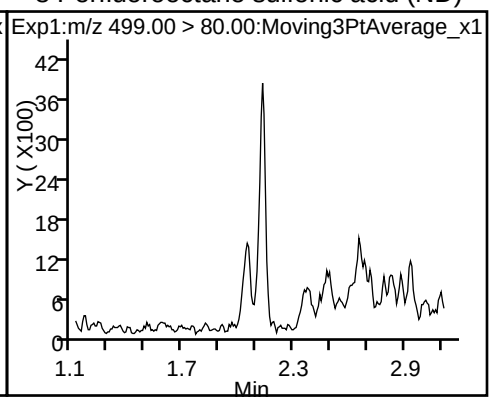
5 Perfluorooctanoic acid (ND)



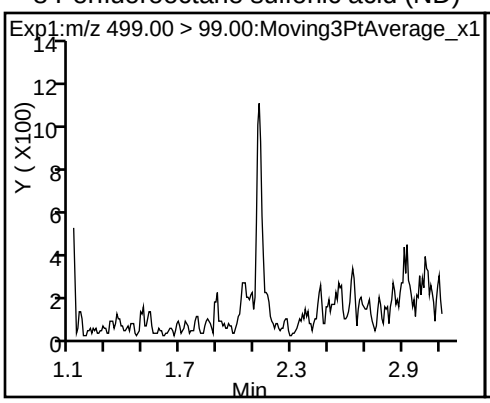
5 Perfluorooctanoic acid (ND)



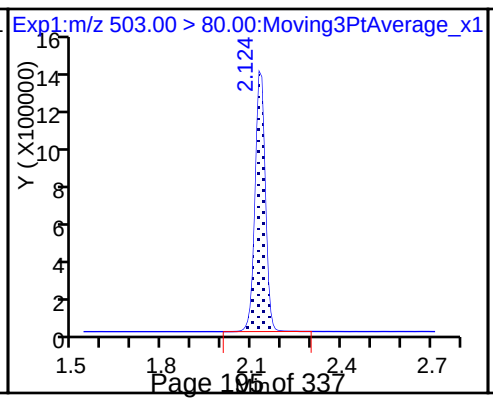
8 Perfluorooctane sulfonic acid (ND)



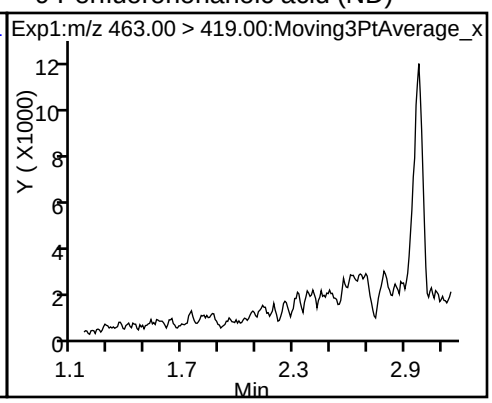
8 Perfluorooctane sulfonic acid (ND)



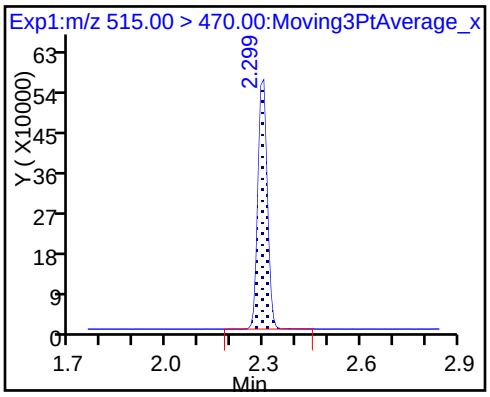
* 7 13C4 PFOS



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.299
Y (X10000)
63
54
45
36
27
18
9
0
1.7
2.0
2.3
2.6
2.9
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_025.d				
Lims ID:	320-33018-A-14-A				
Client ID:	NAWC-110217-FRB-348				
Sample Type:	Client				
Inject. Date:	13-Nov-2017 04:15:29	ALS Bottle#:	17	Worklist Smp#:	22
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-33018-a-14-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	14-Nov-2017 17:12:07	Calib Date:	03-Nov-2017 14:01:24		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK010				

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	9.01	90.09
$ 10 13C2 PFDA	10.0	8.84	88.43

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: WGNA-110217-RW-3882 | Lab Sample ID: 320-33018-15

Matrix: Water | Lab File ID: 2017.11.13_537A_026.d

Analysis Method: 537 | Date Collected: 11/02/2017 15:40

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 250.9(mL) | Date Analyzed: 11/13/2017 04:20

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.0	J	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	7.1	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.2	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.7	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	83		70-130
STL00996	13C2 PFDA	84		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_026.d
Lims ID: 320-33018-A-15-A
Client ID: WGNA-110217-RW-3882
Sample Type: Client
Inject. Date: 13-Nov-2017 04:20:10 ALS Bottle#: 18 Worklist Smp#: 23
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-15-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 17:05:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.444	-0.018	1.000	147276	1.16		70.2	
298.90 > 99.00	1.426	1.444	-0.018	1.000	105316		1.40(0.00-0.00)	240	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1530030	8.32		6928	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.725	-0.026	1.000	392349	2.06		284	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.725	-0.026	1.000	146093	0.9334		34.0	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.913	-0.031		1670566	10.0		6616	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.882	1.914	-0.032	1.000	274898	1.78		44.5	
413.00 > 169.00	1.882	1.914	-0.032	1.000	167172		1.64(0.00-0.00)	160	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.124	2.117	0.007	1.000	240635	2.25		110	
499.00 > 99.00	2.117	2.117	0.0	0.996	40039		6.01(0.00-0.00)	71.0	
* 7 13C4 PFOS									
503.00 > 80.00	2.117	2.151	-0.034		3261923	28.7		3593	
9 Perfluorononanoic acid									M
463.00 > 419.00	2.124	2.158	-0.034	1.000	29461	0.2655		6.8	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.312	-0.021	1.000	1078285	8.44		7251	

QC Flag Legend

Review Flags

M - Manually Integrated

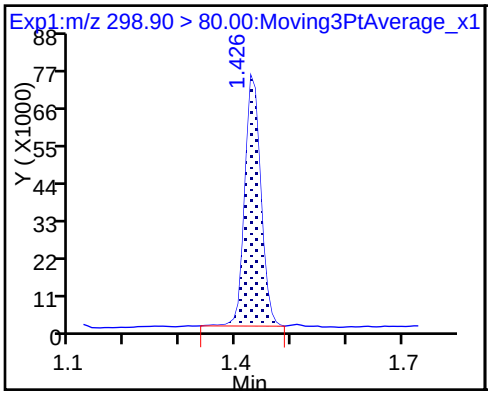
Report Date: 14-Nov-2017 17:12:14 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

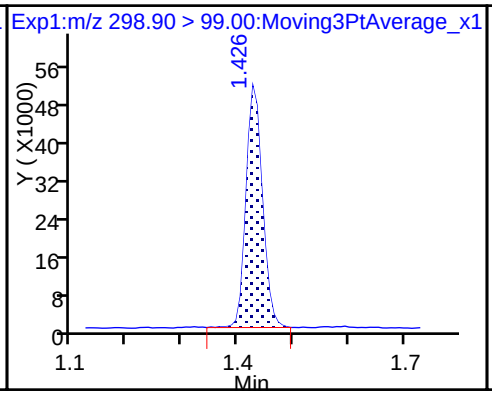
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_026.d

Injection Date:	13-Nov-2017 04:20:10	Instrument ID:	A8_N		
Lims ID:	320-33018-A-15-A	Lab Sample ID:	320-33018-15		
Client ID:	WGNA-110217-RW-3882				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	18	Worklist Smp#:	23
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

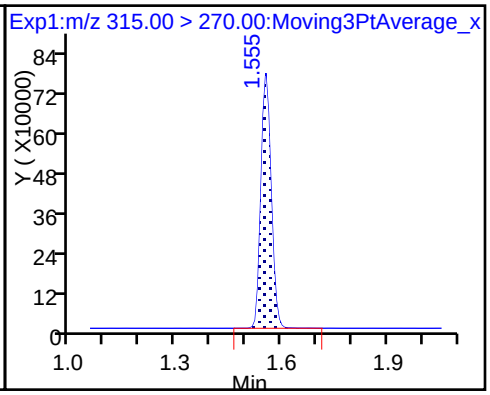
1 Perfluorobutanesulfonic acid



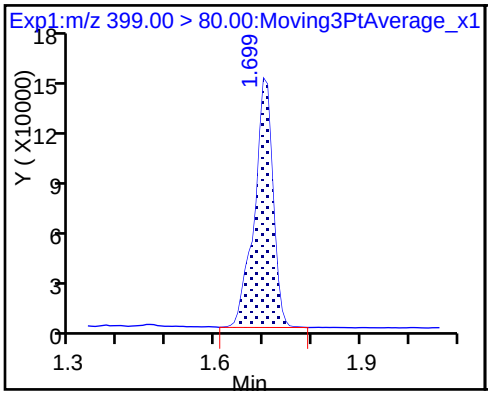
1 Perfluorobutanesulfonic acid



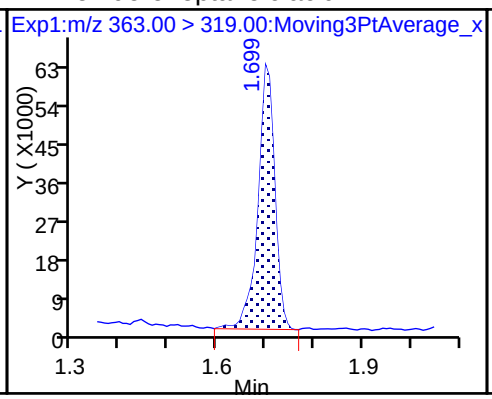
$ 2 13C2 PFHxA



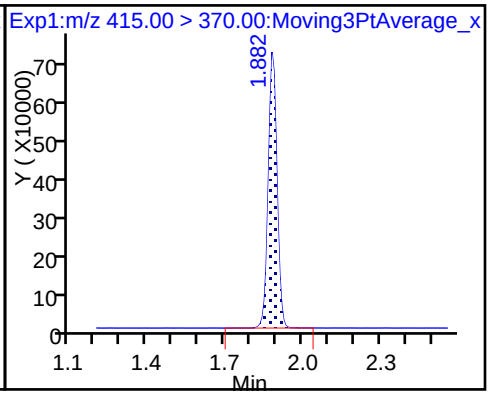
3 Perfluorohexanesulfonic acid



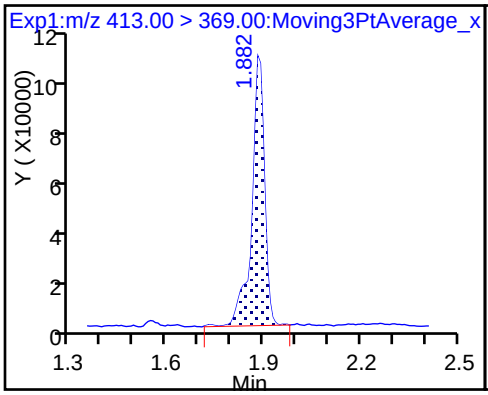
4 Perfluoroheptanoic acid



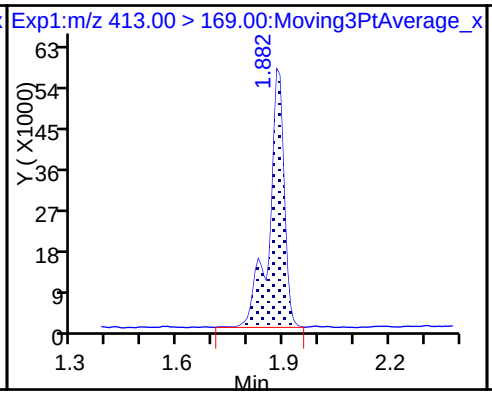
* 6 13C2-PFOA



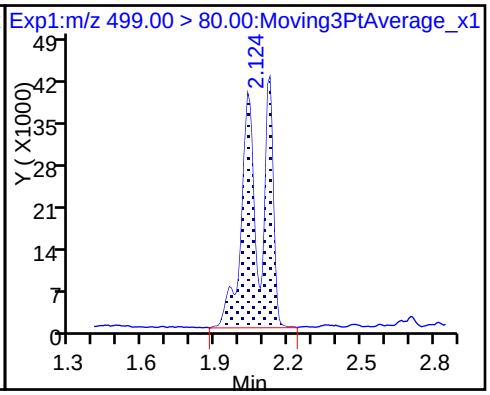
5 Perfluorooctanoic acid



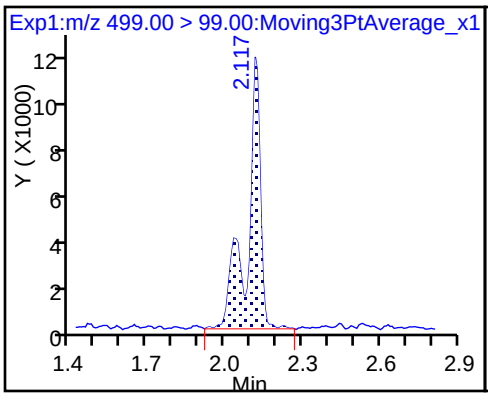
5 Perfluorooctanoic acid



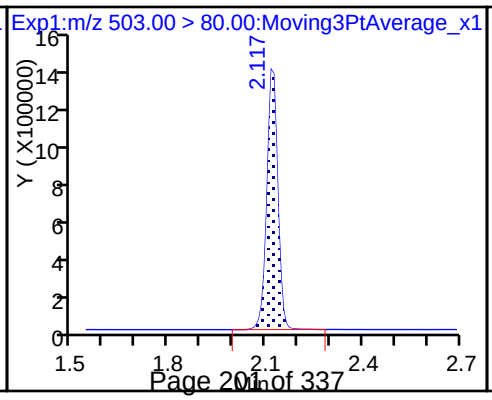
8 Perfluorooctane sulfonic acid



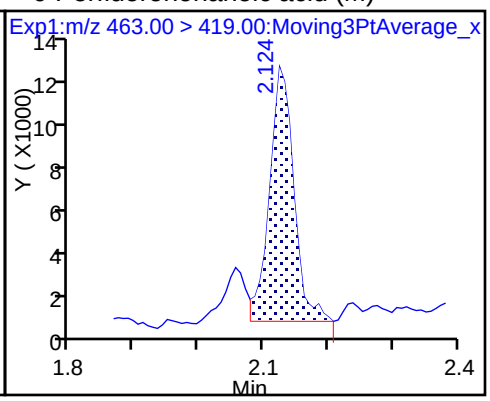
8 Perfluorooctane sulfonic acid



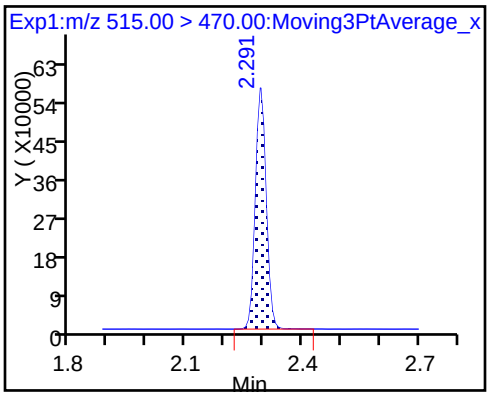
* 7 13C4 PFOS



9 Perfluorononanoic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.291
Y (X10000)
63
54
45
36
27
18
9
0
1.8
2.1
2.4
2.7
Min

TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_026.d
Lims ID: 320-33018-A-15-A
Client ID: WGNA-110217-RW-3882
Sample Type: Client
Inject. Date: 13-Nov-2017 04:20:10 ALS Bottle#: 18 Worklist Smp#: 23
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-15-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 17:05:24

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.32	83.24
$ 10 13C2 PFDA	10.0	8.44	84.35

TestAmerica Sacramento

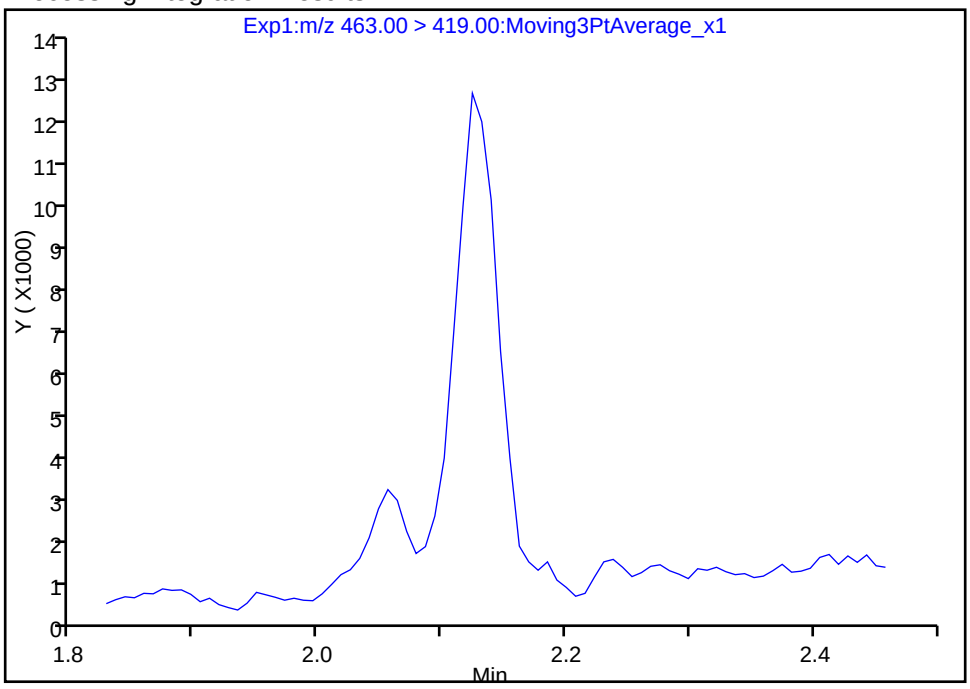
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_026.d				
Injection Date:	13-Nov-2017 04:20:10	Instrument ID:	A8_N		
Lims ID:	320-33018-A-15-A	Lab Sample ID:	320-33018-15		
Client ID:	WGNA-110217-RW-3882				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	18	Worklist Smp#:	23
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

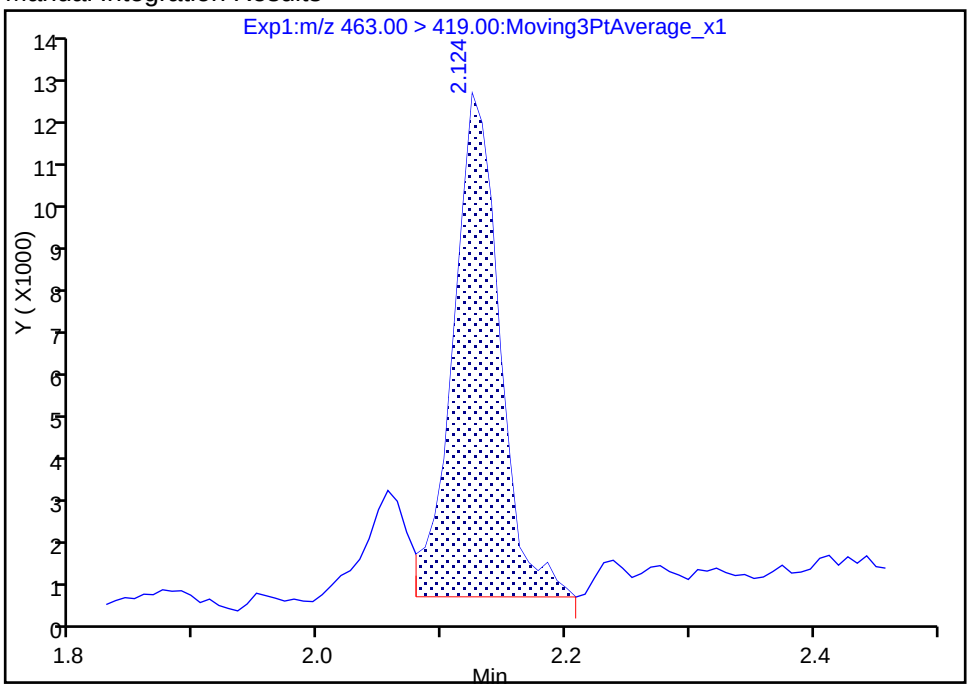
Not Detected
Expected RT: 2.16

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 29461
Amount: 0.265528
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:05:08
Audit Action: Manually Integrated Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: WGNA-110217-FRB-3882 | Lab Sample ID: 320-33018-16

Matrix: Water | Lab File ID: 2017.11.13_537A_027.d

Analysis Method: 537 | Date Collected: 11/02/2017 15:35

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 247.9(mL) | Date Analyzed: 11/13/2017 04:24

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	85		70-130
STL00996	13C2 PFDA	86		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_027.d
Lims ID: 320-33018-A-16-A
Client ID: WGNA-110217-FRB-3882
Sample Type: Client
Inject. Date: 13-Nov-2017 04:24:51 ALS Bottle#: 19 Worklist Smp#: 24
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33018-a-16-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1565063	8.46		5978	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.913	-0.031		1680590	10.0		6439	
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.151	-0.027		3129778	28.7		4835	
$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.312	-0.021	1.000	1100409	8.56		7335	

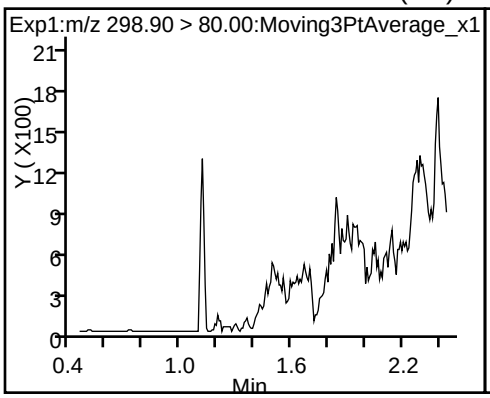
Report Date: 14-Nov-2017 17:12:15 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

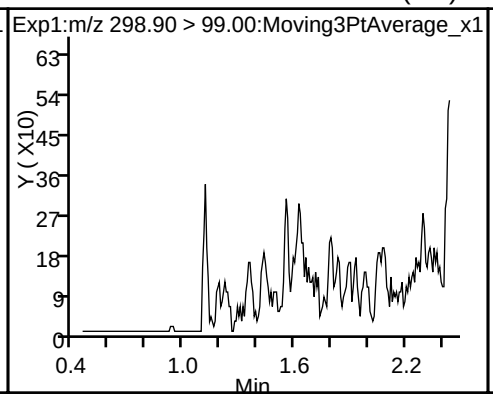
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_027.d

Injection Date:	13-Nov-2017 04:24:51	Instrument ID:	A8_N		
Lims ID:	320-33018-A-16-A	Lab Sample ID:	320-33018-16		
Client ID:	WGNA-110217-FRB-3882				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	19	Worklist Smp#:	24
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

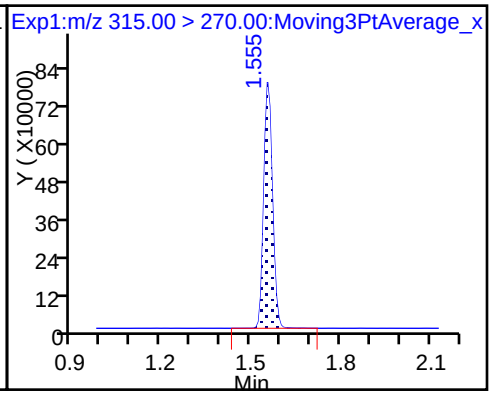
1 Perfluorobutanesulfonic acid (ND)



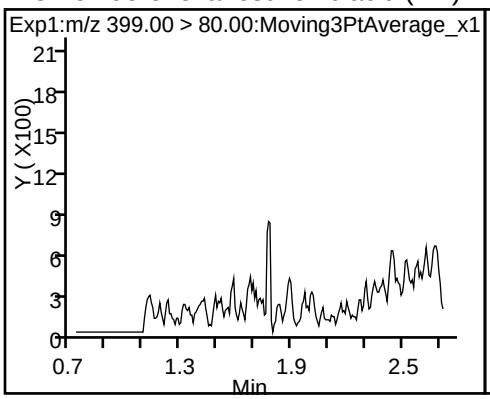
1 Perfluorobutanesulfonic acid (ND)



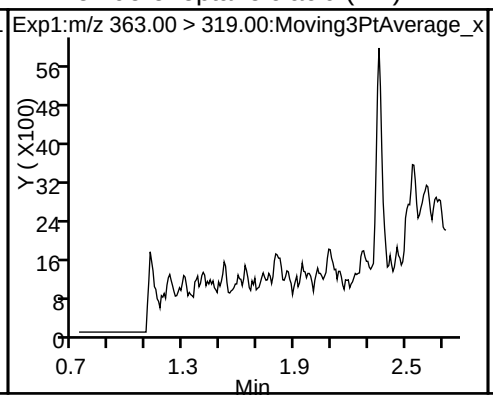
$ 2 13C2 PFHxA



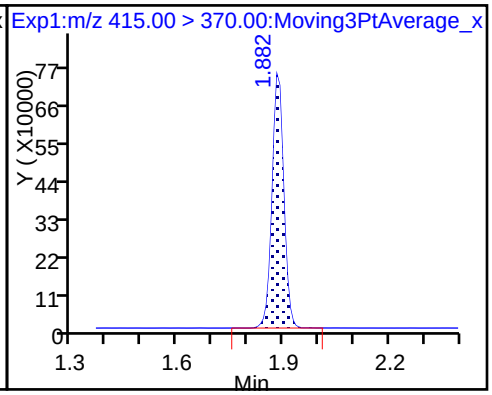
3 Perfluorohexanesulfonic acid (ND)



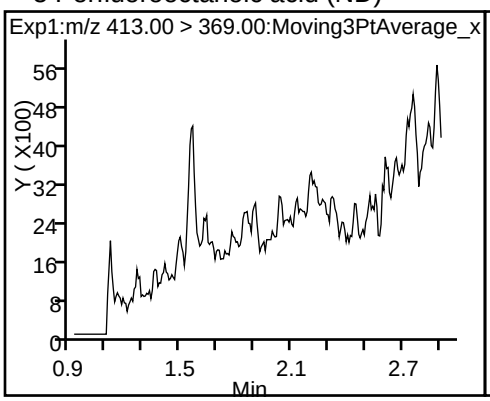
4 Perfluoroheptanoic acid (ND)



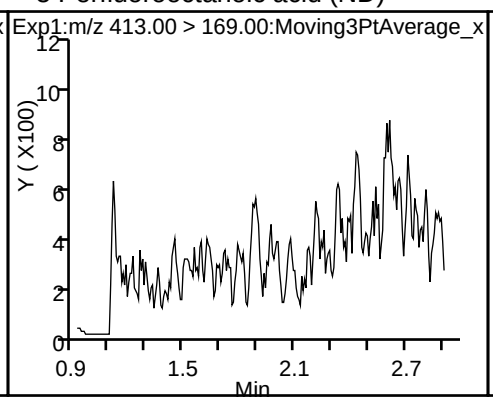
* 6 13C2-PFOA



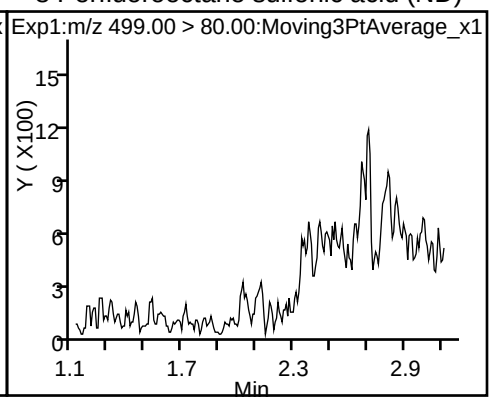
5 Perfluorooctanoic acid (ND)



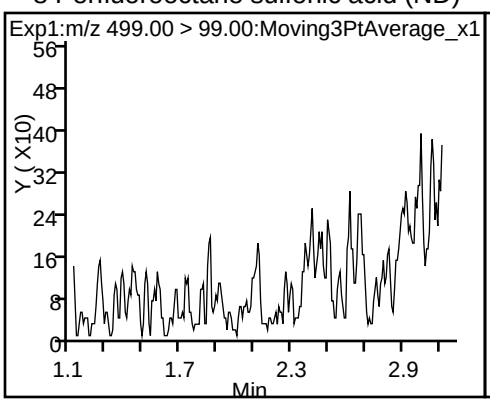
5 Perfluorooctanoic acid (ND)



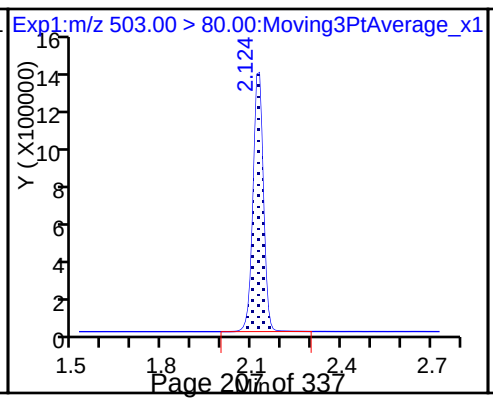
8 Perfluorooctane sulfonic acid (ND)



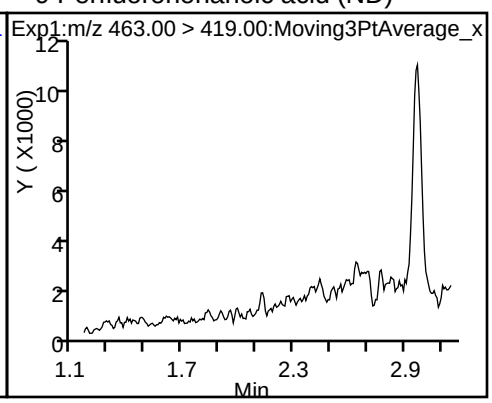
8 Perfluorooctane sulfonic acid (ND)



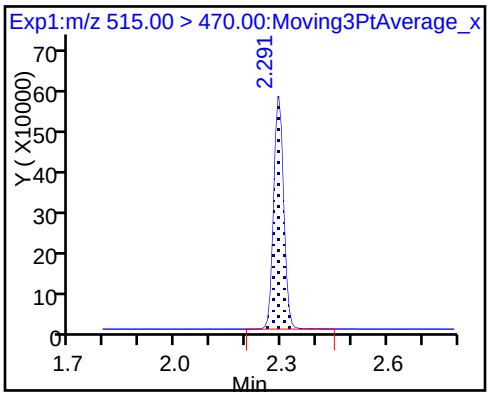
* 7 13C4 PFOS



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.291
Y (X10000)
70
60
50
40
30
20
10
0
1.7
2.0
2.3
2.6
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_027.d				
Lims ID:	320-33018-A-16-A				
Client ID:	WGNA-110217-FRB-3882				
Sample Type:	Client				
Inject. Date:	13-Nov-2017 04:24:51	ALS Bottle#:	19	Worklist Smp#:	24
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-33018-a-16-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	14-Nov-2017 17:12:07	Calib Date:	03-Nov-2017 14:01:24		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK010				

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.46	84.64
$ 10 13C2 PFDA	10.0	8.56	85.57

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

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1 Analy Batch No.: 192908

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192908/4	2017.11.03_537XICAL_004.d
Level 2	IC 320-192908/5	2017.11.03_537XICAL_005.d
Level 3	IC 320-192908/6	2017.11.03_537XICAL_006.d
Level 4	IC 320-192908/7	2017.11.03_537XICAL_007.d
Level 5	IC 320-192908/8	2017.11.03_537XICAL_008.d
Level 6	IC 320-192908/9	2017.11.03_537XICAL_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)	1.0397 0.8468	1.0767	1.0898	0.9577	0.9303	QuaF		1.1193	-0.001498						0.9990		0.9600
Perfluoroheptanoic acid (PFHpA)	0.9433 0.9848	0.9187	0.9551	0.9185	0.9011	Ave		0.9369				3.2		30.0			
Perfluorohexanesulfonic acid (PFHxS)	1.6459 1.6841	1.6355	1.7405	1.6631	1.6755	Ave		1.6741				2.2		30.0			
Perfluorooctanoic acid (PFOA)	0.9757 0.9799	0.8919	0.9000	0.8953	0.9117	Ave		0.9258				4.4		30.0			
Perfluorooctanesulfonic acid (PFOS)	0.8958 0.9902	0.9213	0.9281	0.9268	0.9715	Ave		0.9389				3.7		30.0			
Perfluorononanoic acid (PFNA)	0.6610 0.7042	0.6285	0.6624	0.6810	0.6478	Ave		0.6642				3.9		30.0			
13C2 PFHxA	1.0891 1.1664	1.0526	1.1042	1.1123	1.0772	Ave		1.1003				3.5		30.0			
13C2 PFDA	0.7748 0.8159	0.7295	0.7569	0.7811	0.7330	Ave		0.7652				4.3		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.: 320-33018-1 Analy Batch No.: 192908

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192908/4	2017.11.03_537XICAL_004.d
Level 2	IC 320-192908/5	2017.11.03_537XICAL_005.d
Level 3	IC 320-192908/6	2017.11.03_537XICAL_006.d
Level 4	IC 320-192908/7	2017.11.03_537XICAL_007.d
Level 5	IC 320-192908/8	2017.11.03_537XICAL_008.d
Level 6	IC 320-192908/9	2017.11.03_537XICAL_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	QuaF	1076553 16699152	2591121	5461974	10142530	14011858	9.00 180	20.0	45.0	90.0	135
Perfluoroheptanoic acid (PFHpA)	13PFOA	Ave	143455 2810797	331548	736034	1420703	2102676	1.00 20.0	2.22	5.00	10.0	15.0
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	568156 11071993	1312135	2908204	5871843	8413133	3.00 60.0	6.67	15.0	30.0	45.0
Perfluorooctanoic acid (PFOA)	13PFOA	Ave	296934 5597122	644149	1388033	2771271	4257225	2.00 40.0	4.45	10.0	20.0	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	412315 8679676	985487	2067792	4363079	6504279	4.00 80.0	8.89	20.0	40.0	60.0
Perfluorononanoic acid (PFNA)	13PFOA	Ave	201053 4019666	453612	1020851	2106479	3023088	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PFOA	Ave	1655691 1664260	1708988	1701491	1719911	1675220	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PFOA	Ave	1177922 1164156	1184358	1166275	1207887	1139992	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD
QuaF = Quadratic ISTD forced zero

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

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1 Analy Batch No.: 192908

SDG No.:

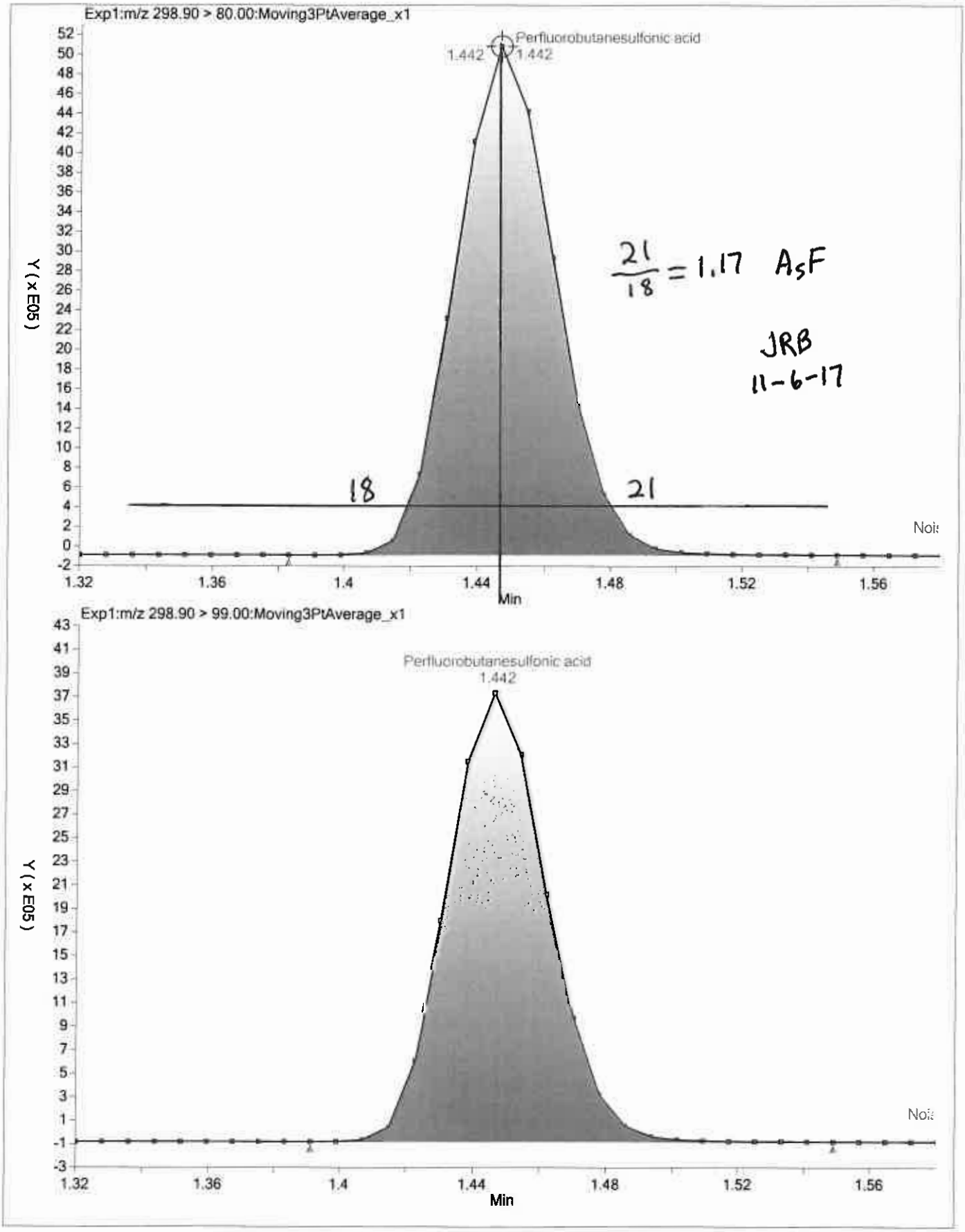
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

Calibration Files:

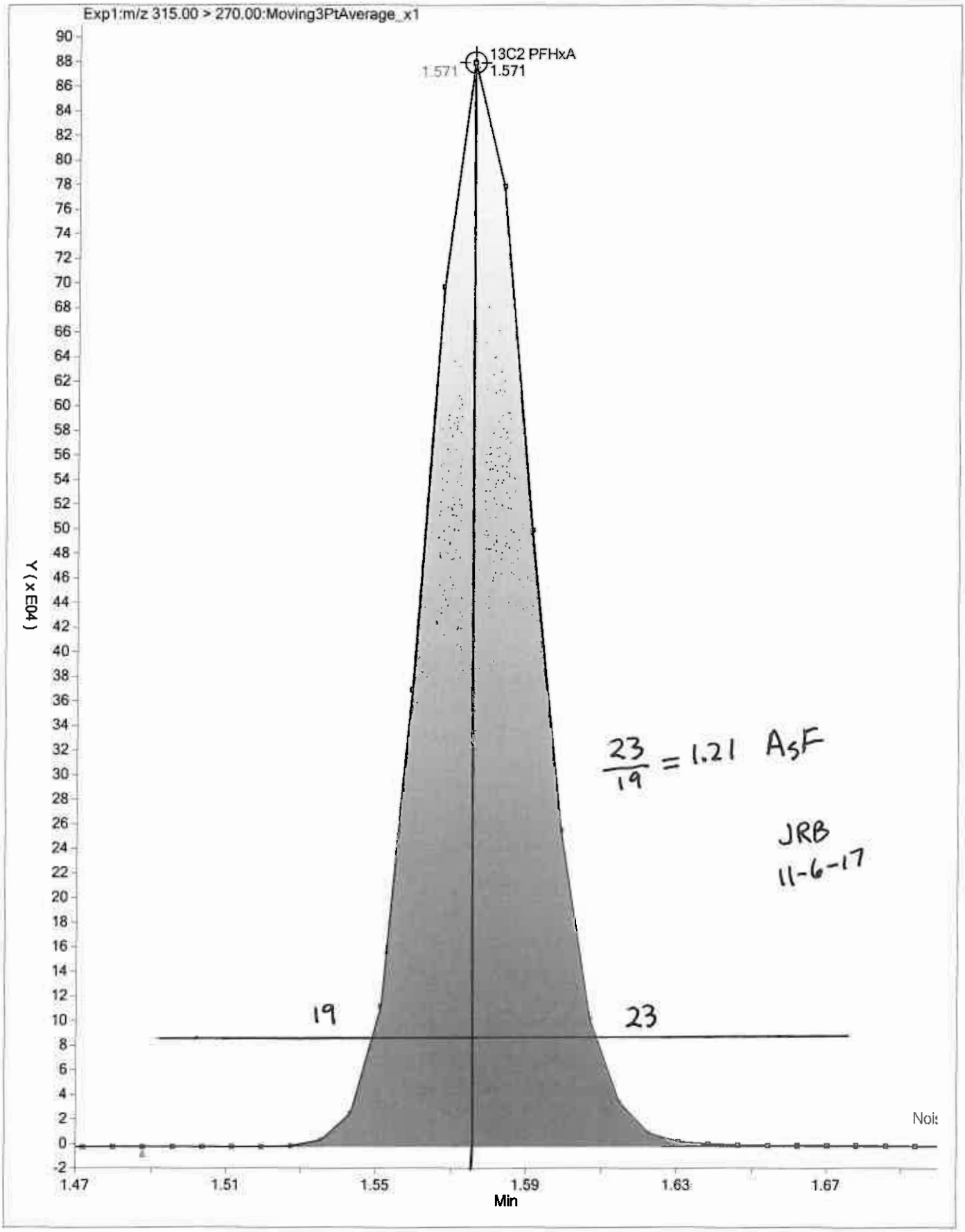
LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192908/4	2017.11.03_537XICAL_004.d
Level 2	IC 320-192908/5	2017.11.03_537XICAL_005.d
Level 3	IC 320-192908/6	2017.11.03_537XICAL_006.d
Level 4	IC 320-192908/7	2017.11.03_537XICAL_007.d
Level 5	IC 320-192908/8	2017.11.03_537XICAL_008.d
Level 6	IC 320-192908/9	2017.11.03_537XICAL_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)	-6.0	-1.2	3.9	-3.1	1.9	-0.5	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	0.7	-1.9	1.9	-2.0	-3.8	5.1	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	-1.7	-2.3	4.0	-0.7	0.1	0.6	50	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	5.4	-3.7	-2.8	-3.3	-1.5	5.8	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-4.6	-1.9	-1.2	-1.3	3.5	5.5	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-0.5	-5.4	-0.3	2.5	-2.5	6.0	50	30	30	30	30	30
13C2 PFHxA	-1.0	-4.3	0.4	1.1	-2.1	6.0	30	30	30	30	30	30
13C2 PFDA	1.3	-4.7	-1.1	2.1	-4.2	6.6	30	30	30	30	30	30



$\frac{21}{18} = 1.17$ A_SF

JRB
11-6-17


Exp1:m/z 315.00 > 270.00:Moving3PtAverage_x1
13C2 PFHxA
1.571
1.571
Y (x E04)
Min
1.47
1.51
1.55
1.59
1.63
1.67
19
23
23/19 = 1.21 AsF
JRB
11-6-17

TestAmerica Laboratories
Istd/Surrogate Recovery Report

Worklist Name: 03NOV2017_537A_ICAL Worklist Num: 49975
Instrument: A8_N Method: 537_A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b
Limit Group: LC 537 ICAL
Analysis Type: SemiVOA
Inj Volume: 2.00 Inj Vol Units: ul

Lims Batch: 192908
CCV IS Mode: Select Ical Level, Cal Level: 3
Non-Cal IS Mode: Last Ccal Sample

$ 2 13C2 PFHxA
$ 10 13C2 PFDA

Lab ID / Inj Date	$ 2	$ 10	* 6 13C2-PFOA	* 7 13C4 PFOS
IS Std			2864400 1.87	6253426 2.11
# 1 RB 03-Nov-2017 13:23:59			1.94 1485386 51.9	2.16 3471256 55.5
# 2 RB 03-Nov-2017 13:28:38			1.93 1511056 52.8	2.16 3340239 53.4
# 3 RB 03-Nov-2017 13:33:19			1.92 1483949 51.8	2.16 3285228 52.5
IS Std				
# 4 IC L1 03-Nov-2017 13:37:59	1.58 98.98	2.31 101.30	1.92 1520258> 100.0*	2.16 3298877> 100.0*
# 5 IC L2 03-Nov-2017 13:42:39	1.58 95.66	2.31 95.33	1.92 1623614> 106.8*	2.16 3450592> 104.6*
# 6 IC L3 03-Nov-2017 13:47:20	1.57 100.40	2.31 98.91	1.91 1540946> 101.4*	2.15 3194016> 96.8*
# 7 IC L4 03-Nov-2017 13:52:00	1.57 101.10	2.31 102.10	1.91 1546307> 101.7*	2.16 3374600> 102.3*
# 8 IC L5 03-Nov-2017 13:56:41	1.57 97.90	2.31 95.80	1.91 1555174> 102.3*	2.15 3199479> 97.0*
# 9 IC L6 03-Nov-2017 14:01:24	1.57 106.00	2.31 106.60	1.90 1426806> 93.9*	2.15 3141787> 95.2*
IS Std			1540946 1.91	3194016 2.15
#10 RB 03-Nov-2017 14:06:04			1.91 1395383 90.6	2.15 3212781 100.6
IS Std			1546307 1.91	3374600 2.16
#11 CCVL 03-Nov-2017 14:10:44	1.58 97.03	2.31 97.49	1.91 1586829 102.6	2.15 3305852 98.0
IS Std			1586829 1.91	3305852 2.15
#12 RB 03-Nov-2017 14:15:23			1.90 1415042 89.2	2.14 3122656 94.5
IS Std			1546307 1.91	3374600 2.16
#13 ICV 03-Nov-2017 14:20:03	1.57 94.41	2.31 96.59	1.90 1512045 97.8	2.14 3433628 101.7
IS Std			1395100 1.91	3254950 2.15
#14 RB 03-Nov-2017 14:24:44			1.91 1395100 100.0	2.15 3254950 100.0

13C2-PFOA

$$RPD = \frac{1623614 - 1426806}{\left(\frac{1623614 + 1426806}{2}\right)}(100) = 12.9$$

13C4-PFOS

$$RPD = \frac{3450592 - 3141787}{\left(\frac{3450592 + 3141787}{2}\right)}(100) = 9.37$$

JRB
11-6-17

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_004.d
Lims ID: IC L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 03-Nov-2017 13:37:59 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 07-Nov-2017 15:52:07 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:18:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.449	1.444	0.005	1.000	1076553	8.46		654	
298.90 > 99.00	1.449	1.444	0.005	1.000	763262		1.41(0.00-0.00)	2025	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.573	0.005	1.000	1655691	9.90		8732	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.730	1.725	0.005	1.000	568156	2.95		1122	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.730	1.725	0.005	1.000	143455	1.01		42.2	
* 6 13C2-PFOA									
415.00 > 370.00	1.920	1.913	0.007		1520258	10.0		6863	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.920	1.914	0.006	1.000	296934	2.11		53.5	
413.00 > 169.00	1.920	1.914	0.006	1.000	149720		1.98(0.00-0.00)	184	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.155	2.147	0.008	1.000	412315	3.82		235	M
499.00 > 99.00	2.155	2.147	0.008	1.000	85347		4.83(0.00-0.00)	209	M
* 7 13C4 PFOS									
503.00 > 80.00	2.155	2.151	0.004		3298877	28.7		5279	
9 Perfluorononanoic acid									
463.00 > 419.00	2.162	2.158	0.004	1.000	201053	1.99		67.8	
$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.312	0.002	1.000	1177922	10.1		7012	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L1_00020 Amount Added: 1.00 Units: mL

Report Date: 07-Nov-2017 15:52:07 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_004.d

Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8_N

Lims ID: IC L1

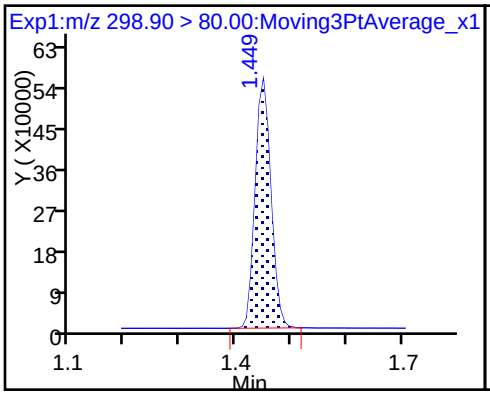
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4

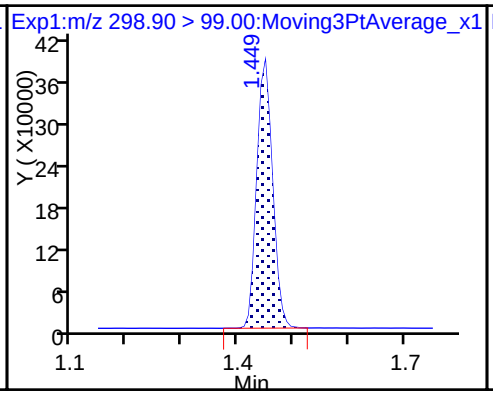
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

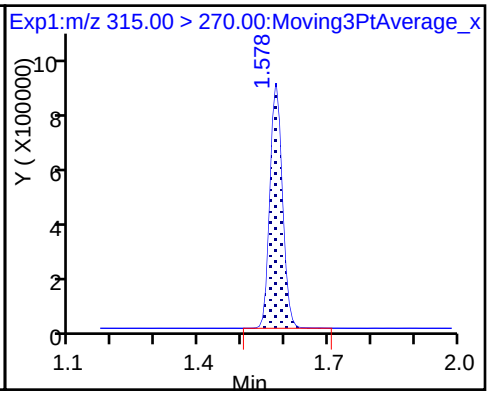
1 Perfluorobutanesulfonic acid



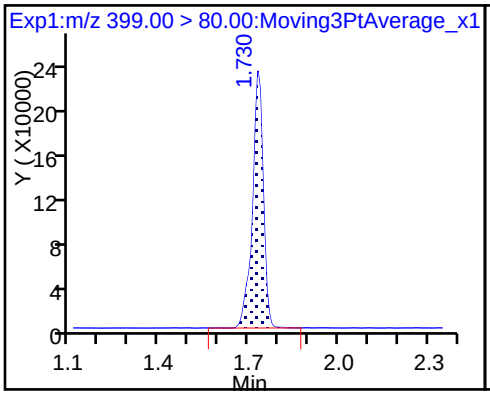
1 Perfluorobutanesulfonic acid



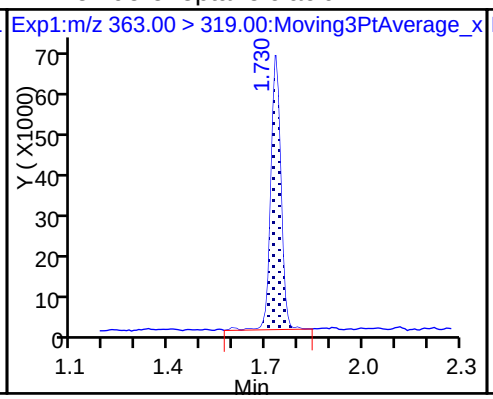
$ 2 13C2 PFHxA



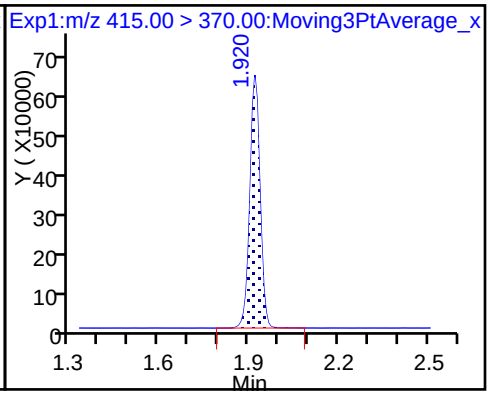
3 Perfluorohexanesulfonic acid



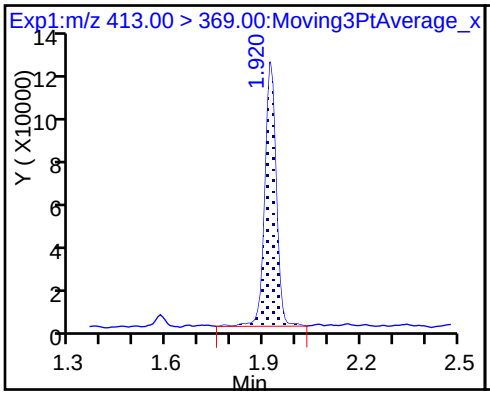
4 Perfluoroheptanoic acid



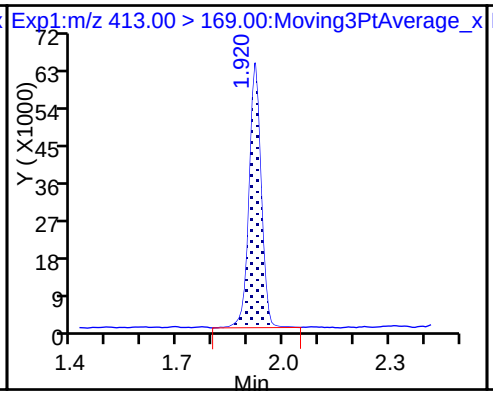
* 6 13C2-PFOA



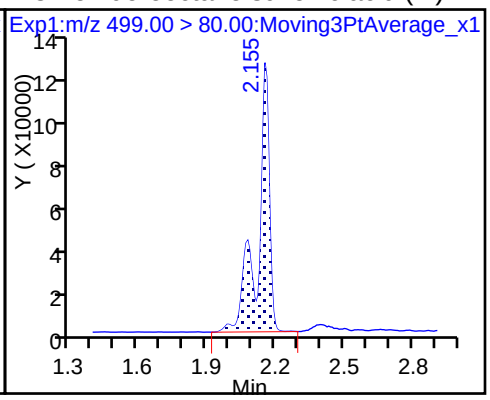
5 Perfluorooctanoic acid



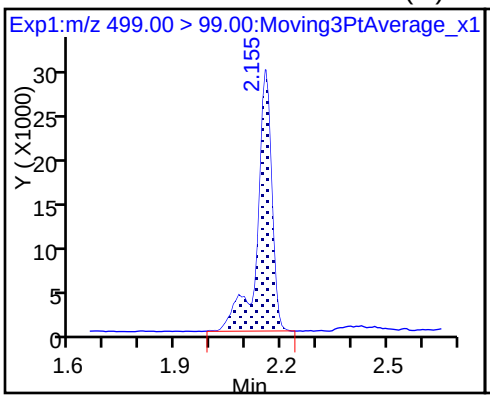
5 Perfluorooctanoic acid



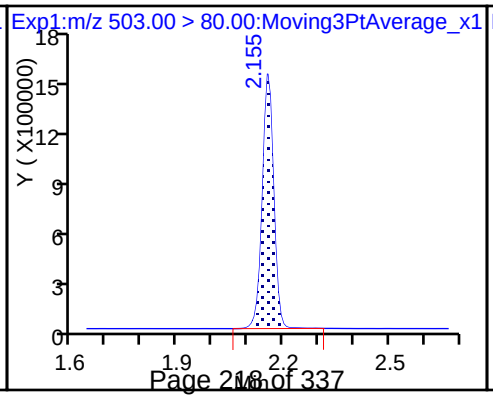
8 Perfluorooctane sulfonic acid (M)



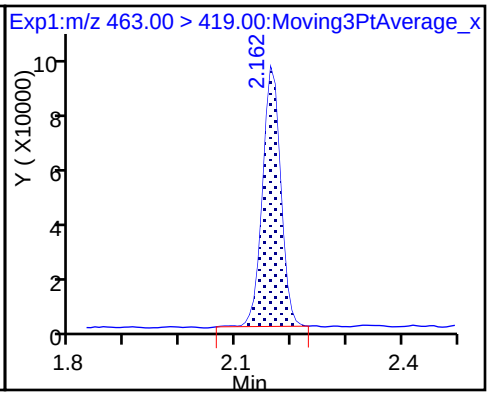
8 Perfluorooctane sulfonic acid (M)



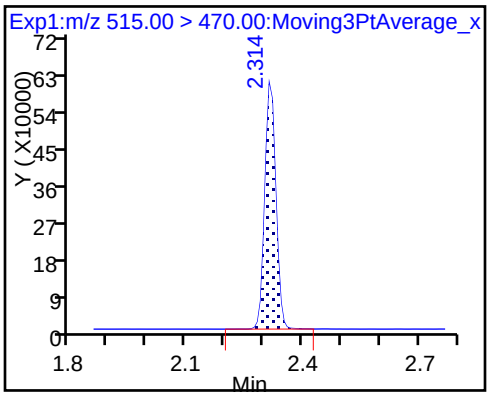
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.314
Y (X10000)
72
63
54
45
36
27
18
9
0
1.8
2.1
2.4
2.7
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

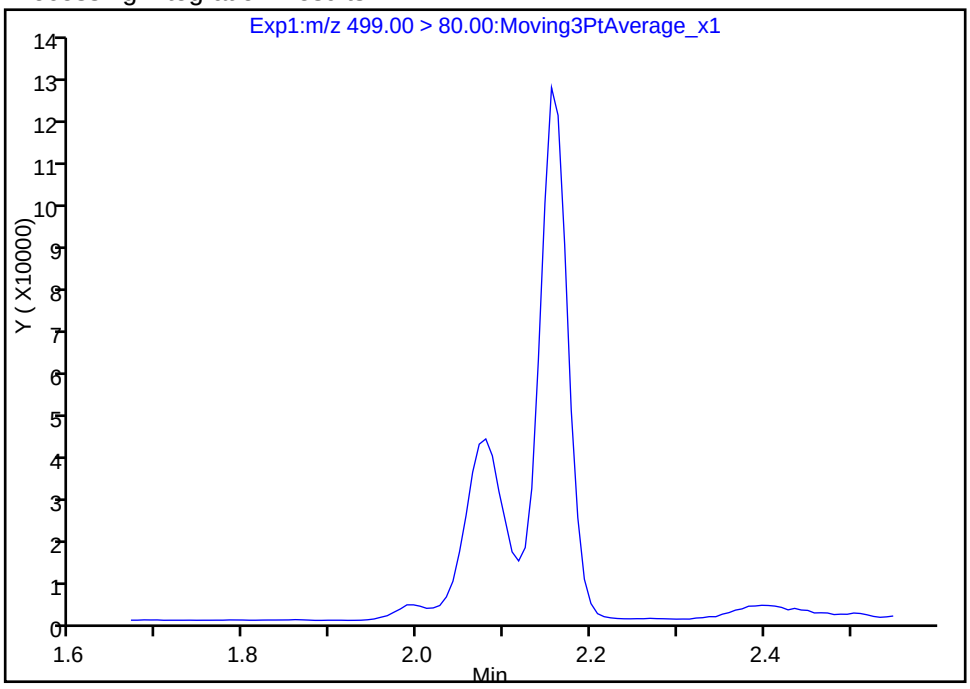
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_004.d
Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

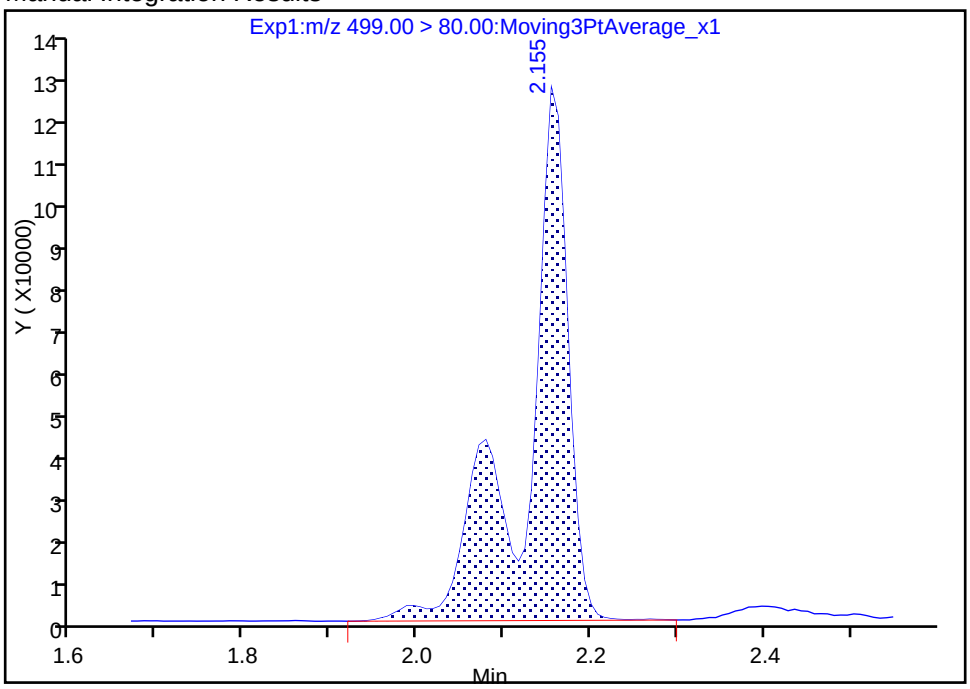
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 412315
Amount: 3.817687
Amount Units: ng/ml



Reviewer: phomsophat, 06-Nov-2017 07:17:28
Audit Action: Assigned Compound ID Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

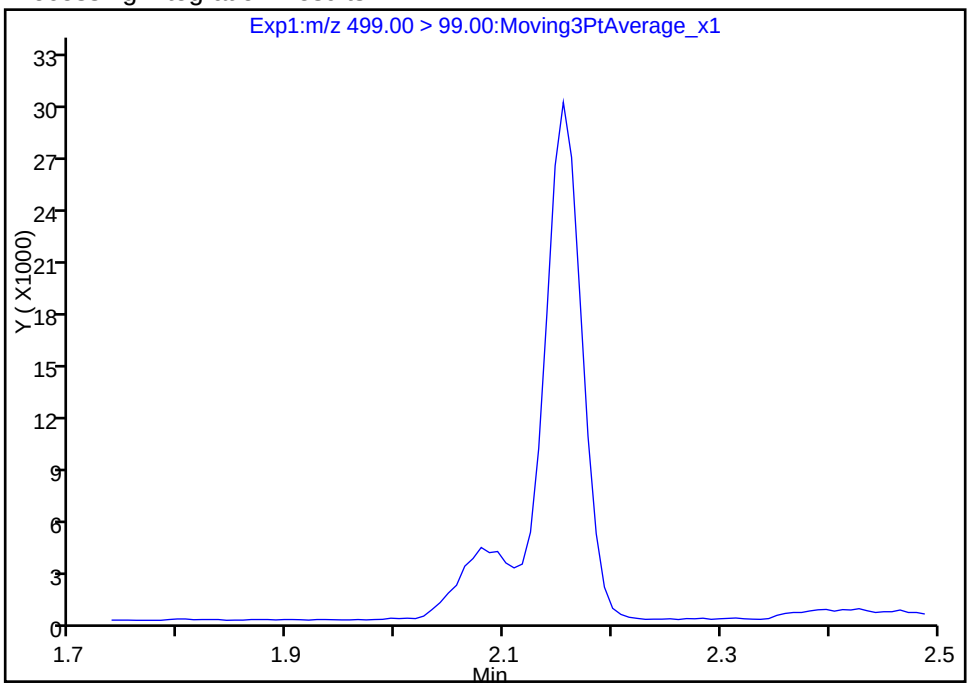
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_004.d
Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

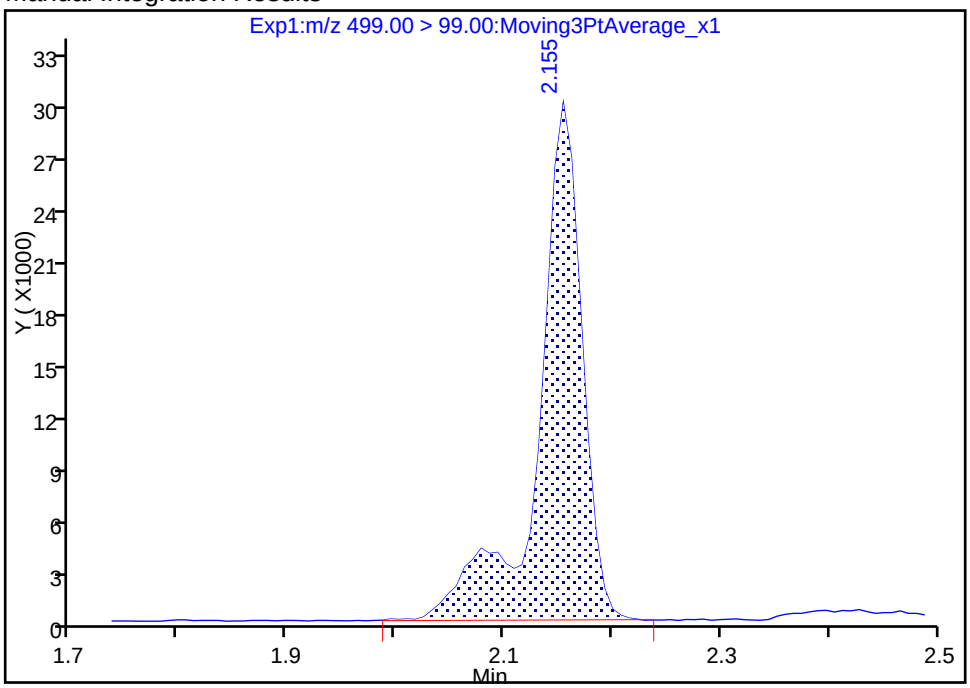
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 85347
Amount: 3.817687
Amount Units: ng/ml



Reviewer: phomsophat, 06-Nov-2017 07:17:37
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

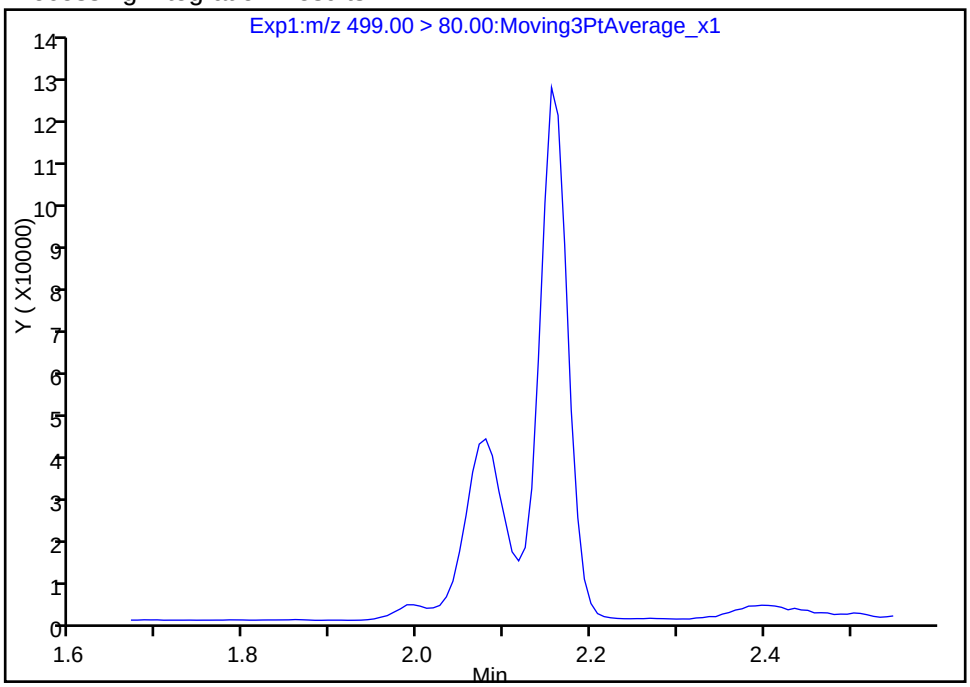
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_004.d
Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

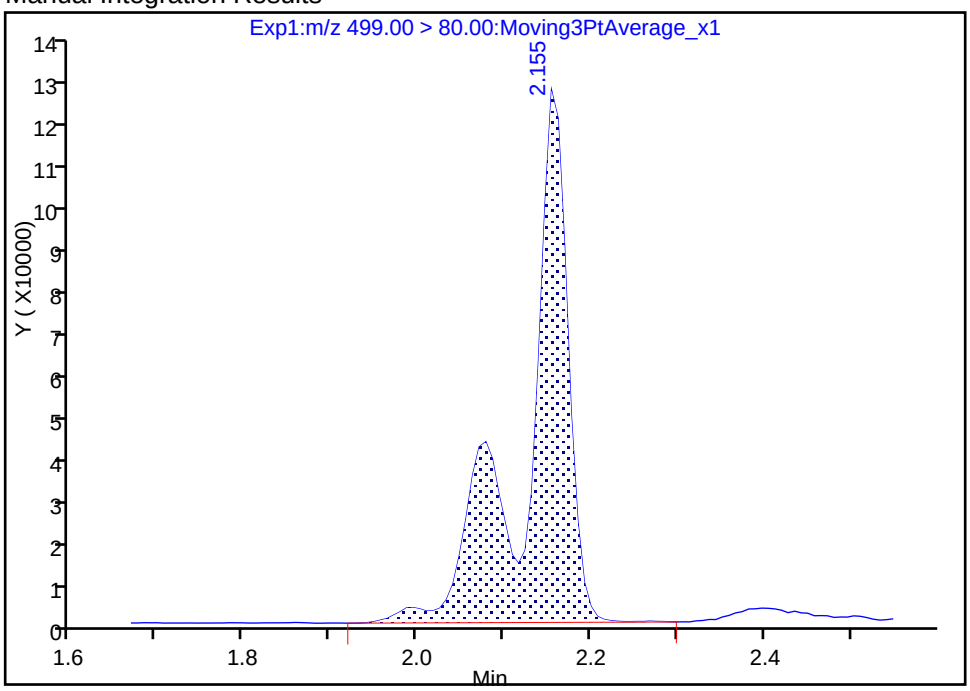
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 412315
Amount: 3.817687
Amount Units: ng/ml



Reviewer: phomsophat, 06-Nov-2017 07:17:37
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_005.d
Lims ID: IC L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 03-Nov-2017 13:42:39 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 07-Nov-2017 15:52:08 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:18:56

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.449	1.444	0.005	1.000	2591121	19.8		1479	
298.90 > 99.00	1.442	1.444	-0.002	0.995	1874928		1.38(0.00-0.00)	4315	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.573	0.005	1.000	1708988	9.57		8562	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.730	1.725	0.005	1.000	331548	2.18		87.8	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.730	1.725	0.005	1.000	1312135	6.51		2317	
* 6 13C2-PFOA									
415.00 > 370.00	1.920	1.913	0.007		1623614	10.0		6970	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.920	1.914	0.006	1.000	644149	4.29		113	
413.00 > 169.00	1.920	1.914	0.006	1.000	329479		1.96(0.00-0.00)	459	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.155	2.147	0.008	1.000	985487	8.72		578	M
499.00 > 99.00	2.155	2.147	0.008	1.000	200739		4.91(0.00-0.00)	449	M
* 7 13C4 PFOS									
503.00 > 80.00	2.155	2.151	0.004		3450592	28.7		5334	
9 Perfluorononanoic acid									
463.00 > 419.00	2.162	2.158	0.004	1.000	453612	4.21		136	
$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.312	0.002	1.000	1184358	9.53		7573	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00020 Amount Added: 1.00 Units: mL

Report Date: 07-Nov-2017 15:52:08 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_005.d

Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8_N

Lims ID: IC L2

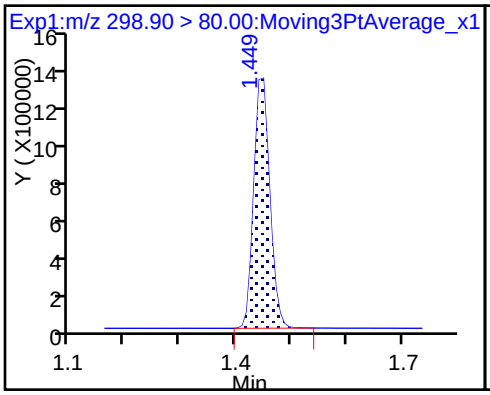
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5

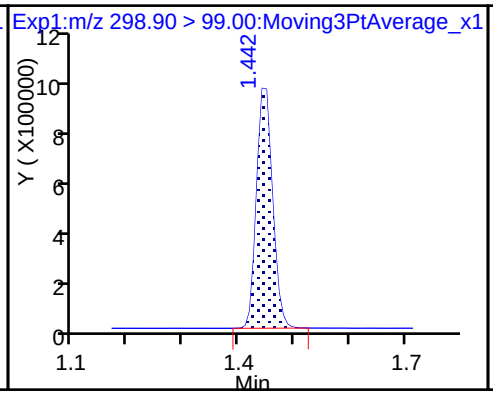
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

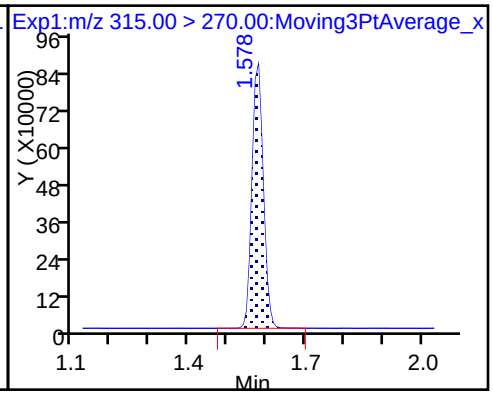
1 Perfluorobutanesulfonic acid



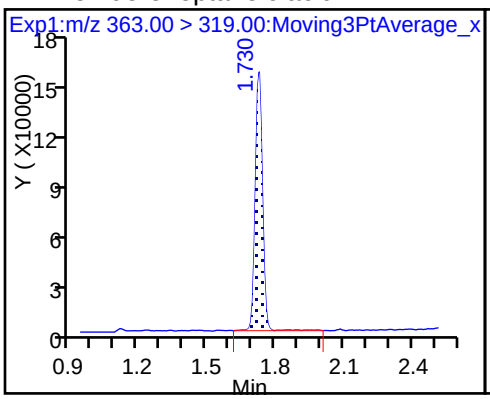
1 Perfluorobutanesulfonic acid



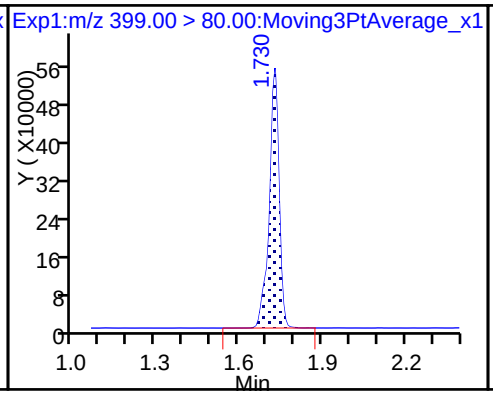
$ 2 13C2 PFHxA



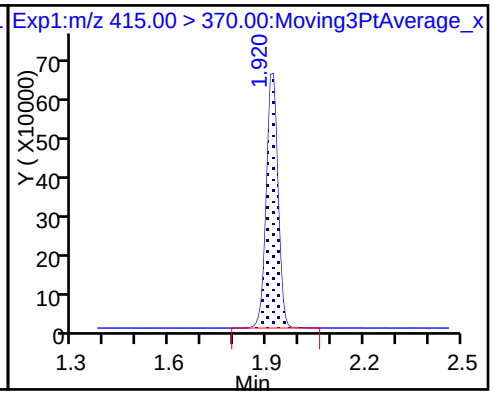
4 Perfluoroheptanoic acid



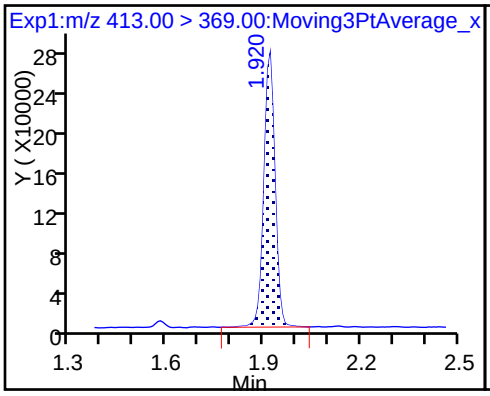
3 Perfluorohexanesulfonic acid



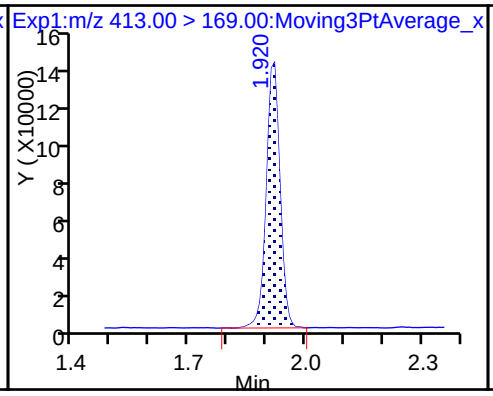
* 6 13C2-PFOA



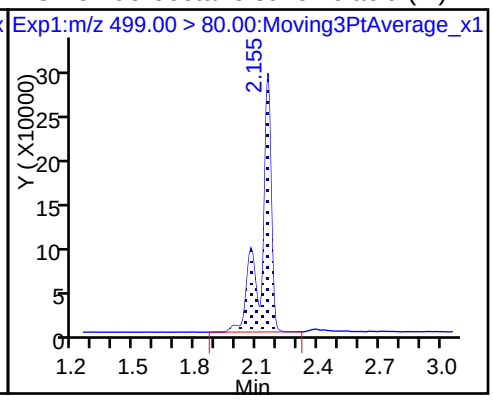
5 Perfluorooctanoic acid



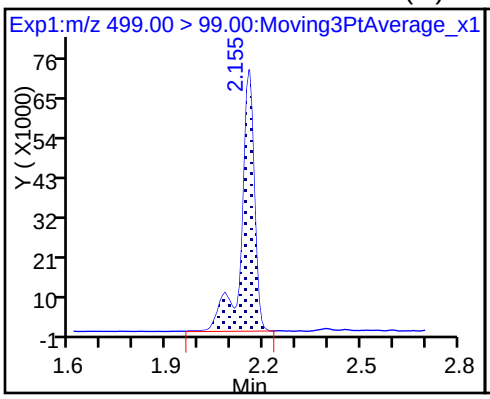
5 Perfluorooctanoic acid



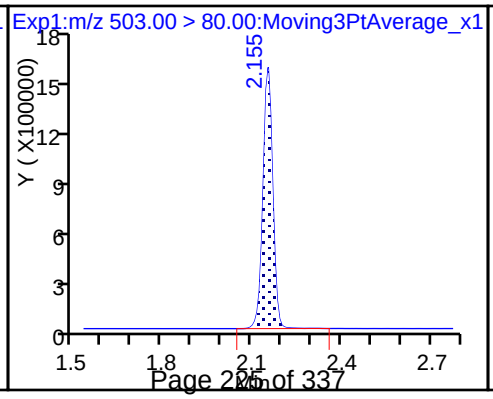
8 Perfluorooctane sulfonic acid (M)



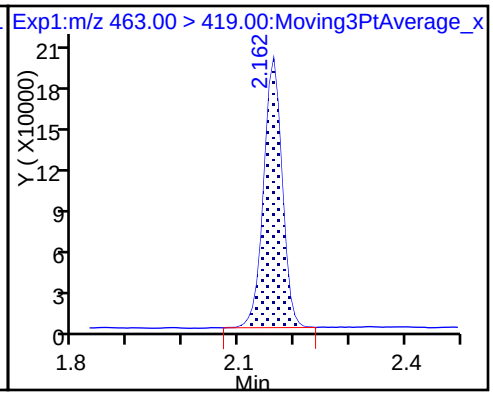
8 Perfluorooctane sulfonic acid (M)



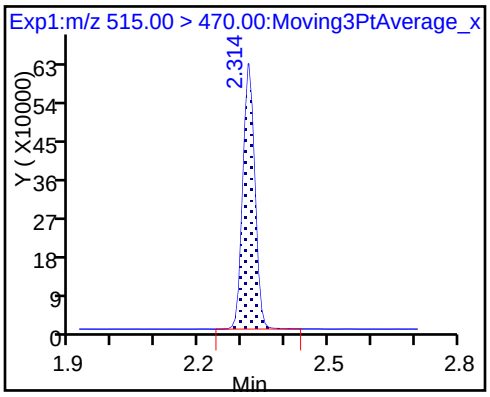
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.314
Y (X10000)
63
54
45
36
27
18
9
0
1.9
2.2
2.5
2.8
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

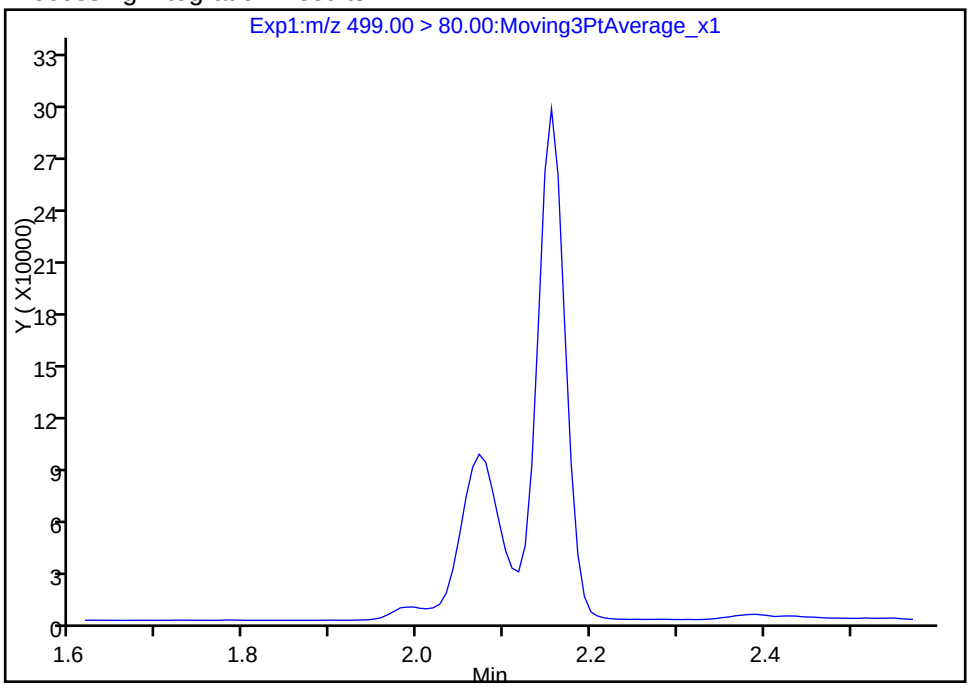
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_005.d				
Injection Date:	03-Nov-2017 13:42:39	Instrument ID:	A8_N		
Lims ID:	IC L2				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	2	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

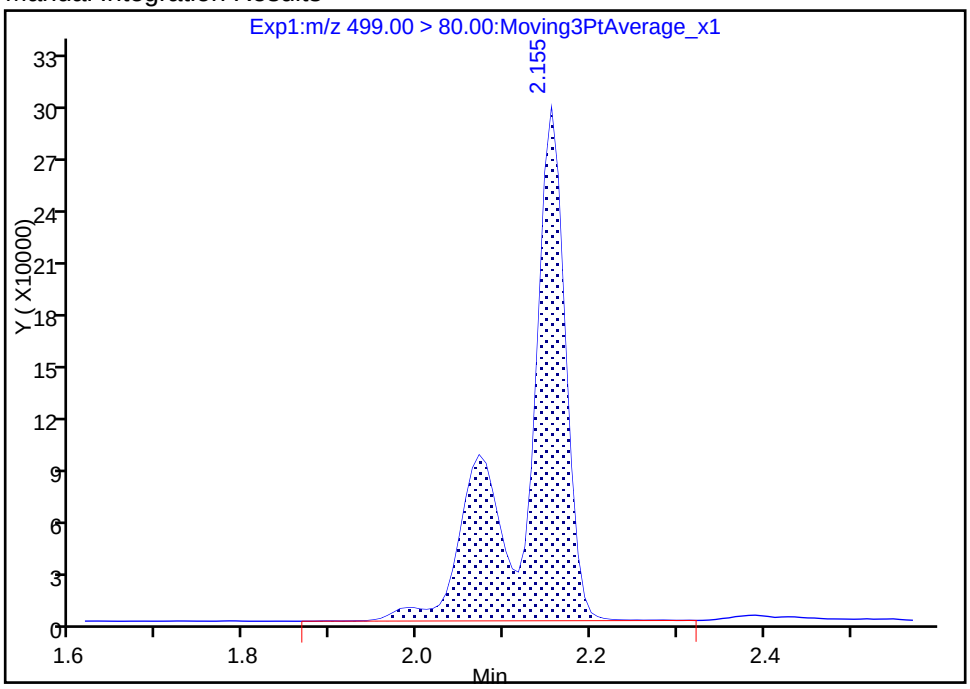
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 985487
Amount: 8.723576
Amount Units: ng/ml



Reviewer: phomsophat, 06-Nov-2017 07:18:13
Audit Action: Assigned Compound ID Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

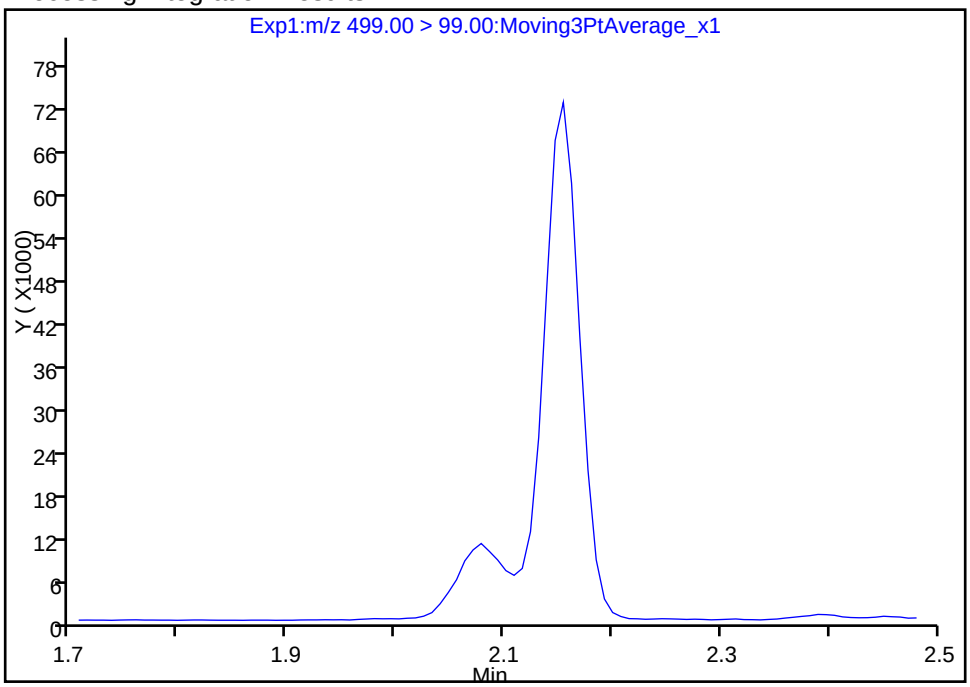
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_005.d
Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

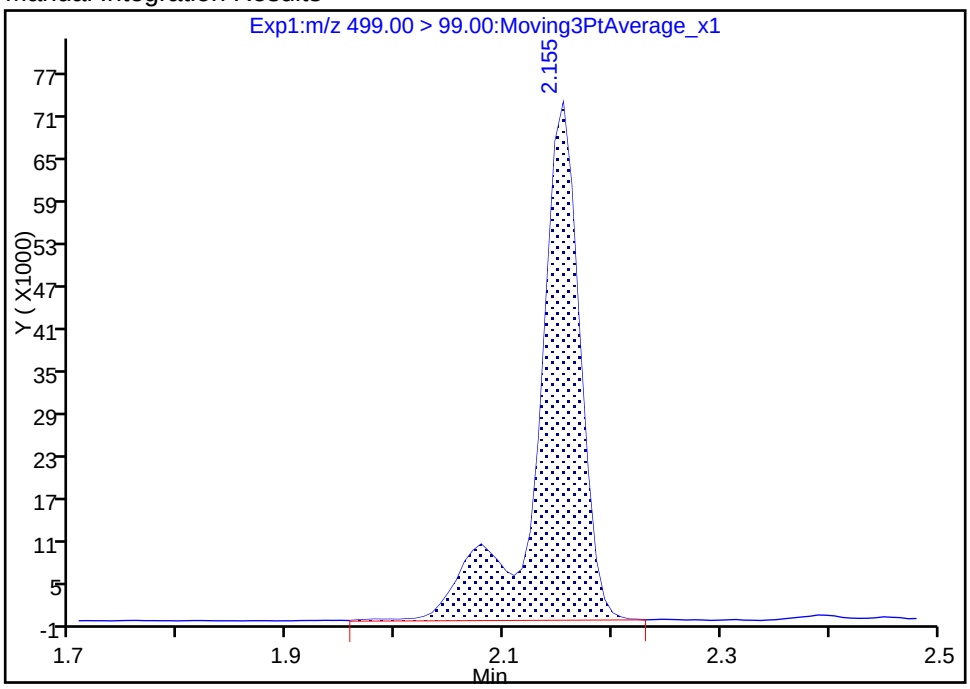
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 200739
Amount: 8.723576
Amount Units: ng/ml



Reviewer: phomsophat, 06-Nov-2017 07:18:24
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

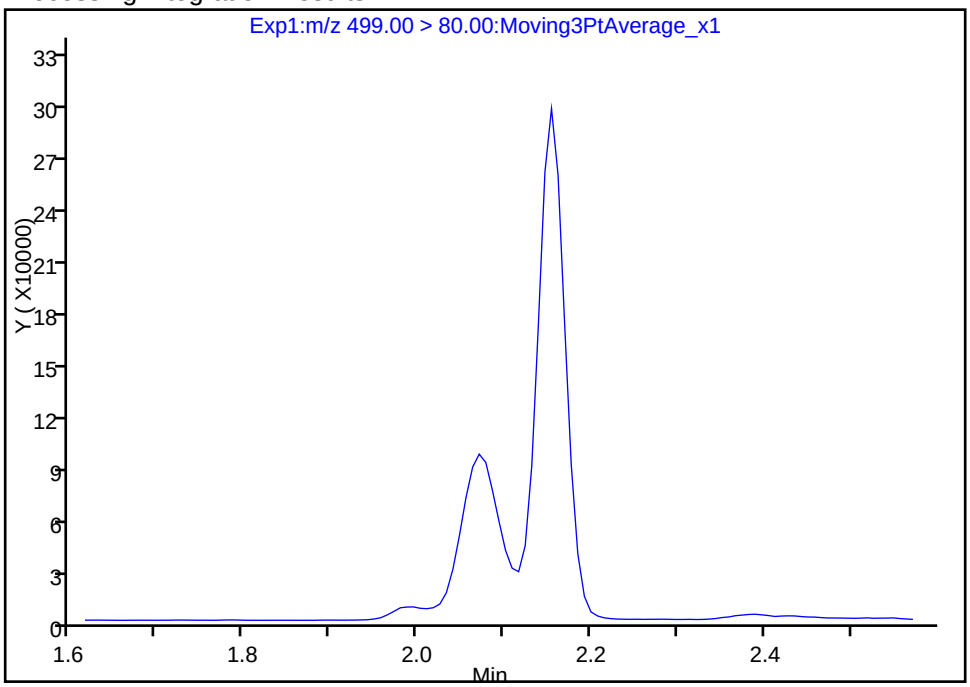
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_005.d
Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

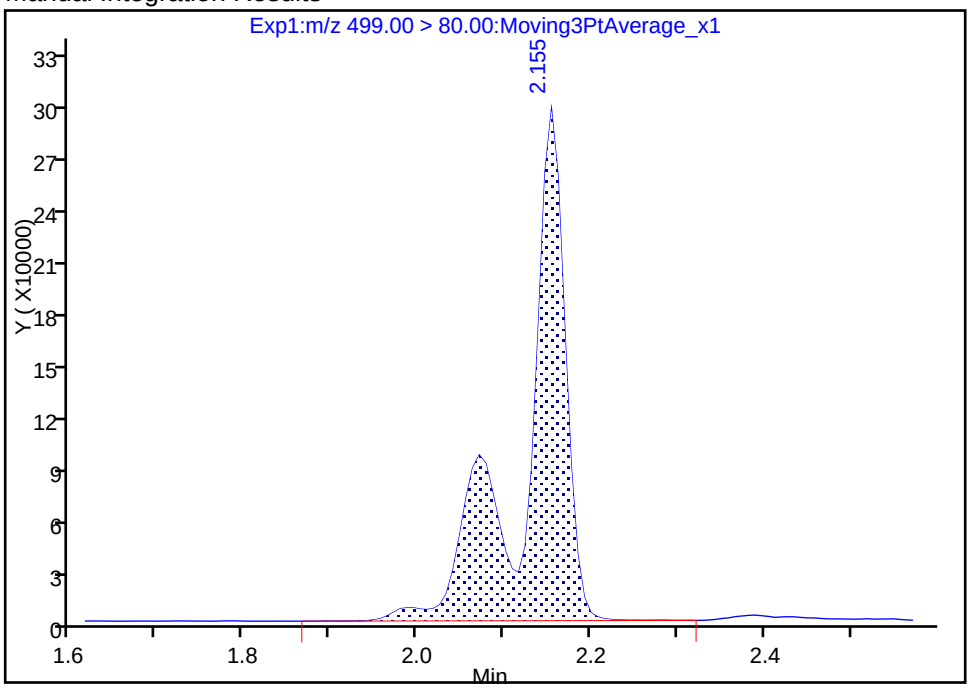
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 985487
Amount: 8.723576
Amount Units: ng/ml



Reviewer: phomsophat, 06-Nov-2017 07:18:24
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_006.d
Lims ID: IC L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 03-Nov-2017 13:47:20 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 07-Nov-2017 15:52:09 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:20:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.444	-0.002	1.000	5461974	46.7		3220	
298.90 > 99.00	1.442	1.444	-0.002	1.000	3903438		1.40(0.00-0.00)	8589	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.573	-0.003	1.000	1701491	10.0		9021	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.725	-0.003	1.000	2908204	15.6		5000	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.725	-0.003	1.000	736034	5.10		208	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.913	-0.001		1540946	10.0		6787	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.914	-0.002	1.000	1388033	9.73		256	
413.00 > 169.00	1.912	1.914	-0.002	1.000	715399		1.94(0.00-0.00)	904	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.147	2.147	0.0	1.000	2067792	19.8		2001	
499.00 > 99.00	2.147	2.147	0.0	1.000	431075		4.80(0.00-0.00)	922	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.151	-0.004		3194016	28.7		4956	
9 Perfluorononanoic acid									
463.00 > 419.00	2.155	2.158	-0.003	1.000	1020851	9.97		302	
$ 10 13C2 PFDA									
515.00 > 470.00	2.306	2.312	-0.006	1.000	1166275	9.89		6310	

Reagents:

LC537-L3_00023 Amount Added: 1.00 Units: mL

Report Date: 07-Nov-2017 15:52:09 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_006.d

Injection Date: 03-Nov-2017 13:47:20 Instrument ID: A8_N

Lims ID: IC L3

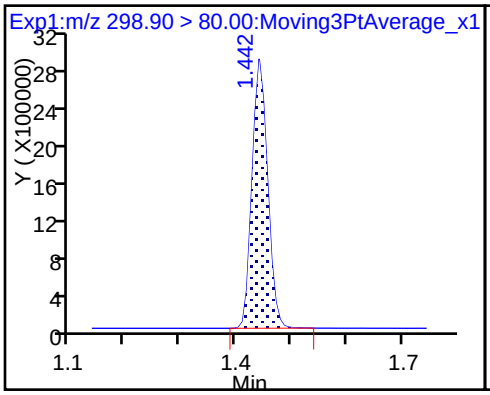
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6

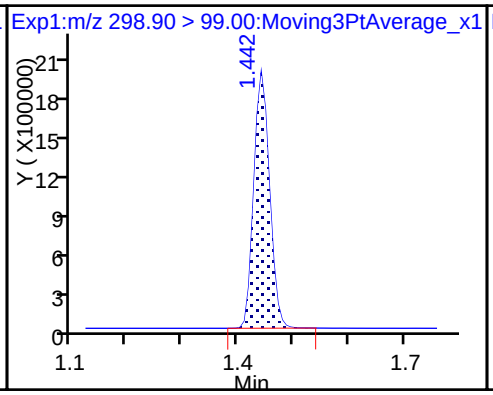
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

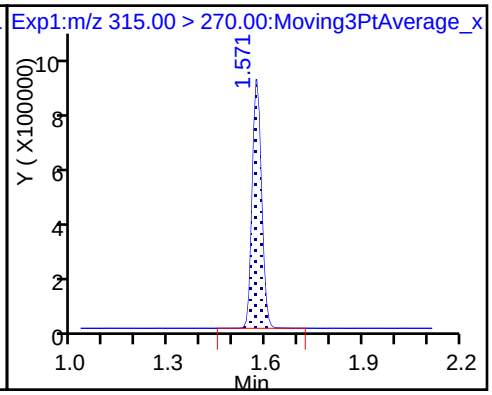
1 Perfluorobutanesulfonic acid



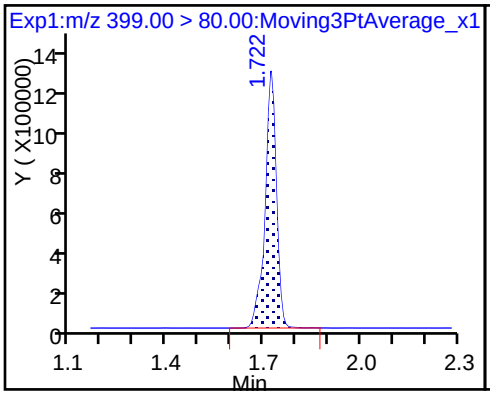
1 Perfluorobutanesulfonic acid



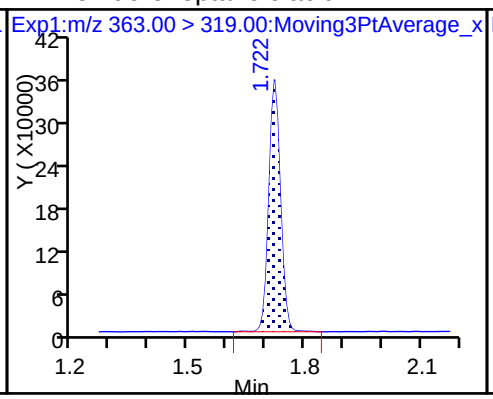
$ 2 13C2 PFHxA



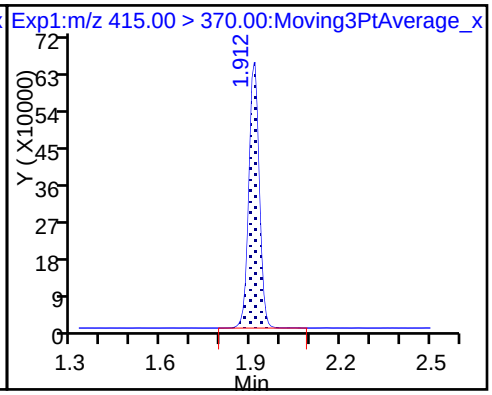
3 Perfluorohexanesulfonic acid



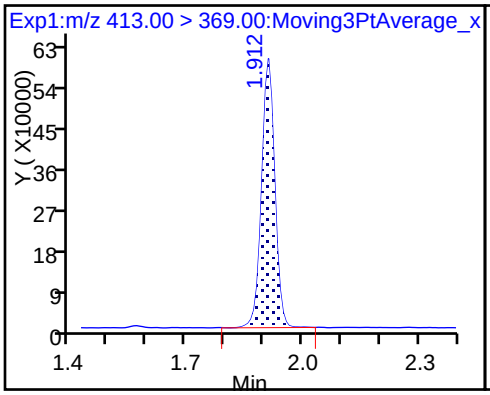
4 Perfluoroheptanoic acid



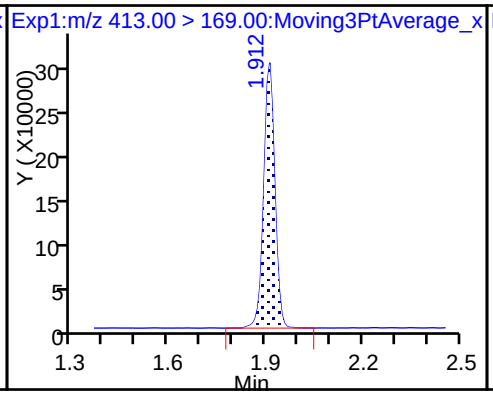
* 6 13C2-PFOA



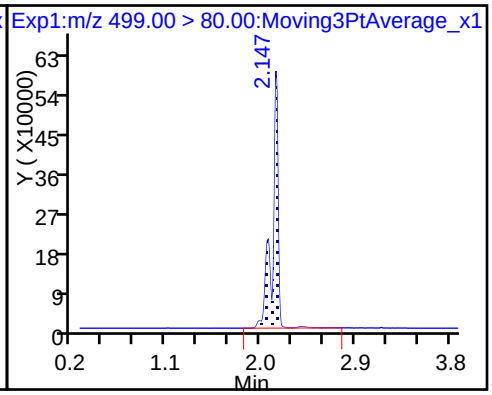
5 Perfluorooctanoic acid



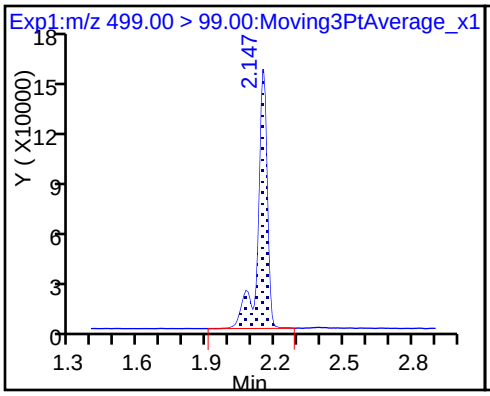
5 Perfluorooctanoic acid



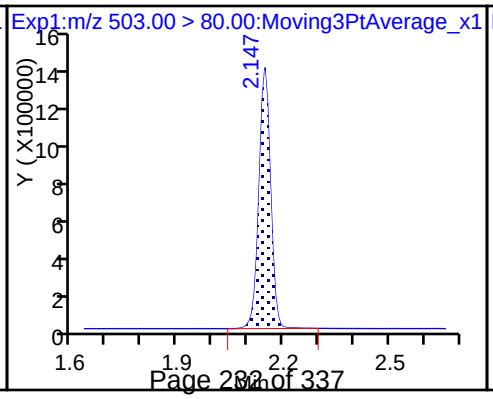
8 Perfluorooctane sulfonic acid



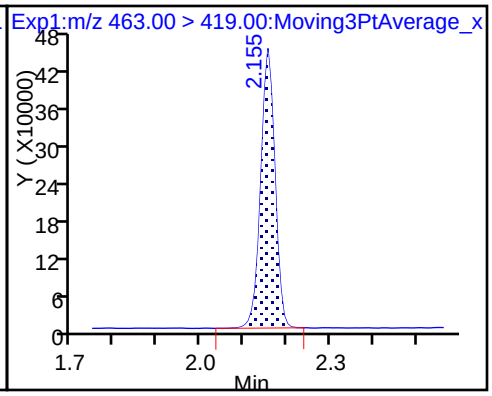
8 Perfluorooctane sulfonic acid



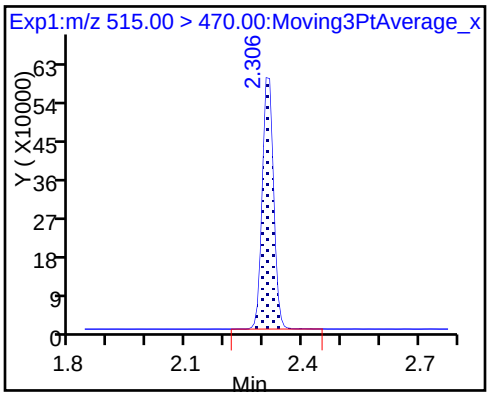
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.306
Y (X10000)
63
54
45
36
27
18
9
0
1.8
2.1
2.4
2.7
Min

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_007.d
Lims ID: IC L4
Client ID:
Sample Type: ICISAV Calib Level: 4
Inject. Date: 03-Nov-2017 13:52:00 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 07-Nov-2017 15:52:10 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:20:46

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.444	-0.002	1.000	10142530	87.2		5274	
298.90 > 99.00	1.442	1.444	-0.002	1.000	7408390		1.37(0.00-0.00)	12862	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.573	-0.003	1.000	1719911	10.1		8503	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.725	-0.003	1.000	1420703	9.81		399	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.725	-0.003	1.000	5871843	29.8		7622	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.913	-0.001		1546307	10.0		6563	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.914	-0.002	1.000	2771271	19.4		505	
413.00 > 169.00	1.912	1.914	-0.002	1.000	1520933		1.82(0.00-0.00)	1919	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.155	2.147	0.008	1.000	4363079	39.5		3896	M
499.00 > 99.00	2.155	2.147	0.008	1.000	902486		4.83(0.00-0.00)	1588	M
* 7 13C4 PFOS									
503.00 > 80.00	2.155	2.151	0.004		3374600	28.7		5331	
9 Perfluorononanoic acid									
463.00 > 419.00	2.162	2.158	0.004	1.000	2106479	20.5		638	
$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.312	0.002	1.000	1207887	10.2		7165	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L4_00020 Amount Added: 1.00 Units: mL

Report Date: 07-Nov-2017 15:52:10 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_007.d

Injection Date: 03-Nov-2017 13:52:00 Instrument ID: A8_N

Lims ID: IC L4

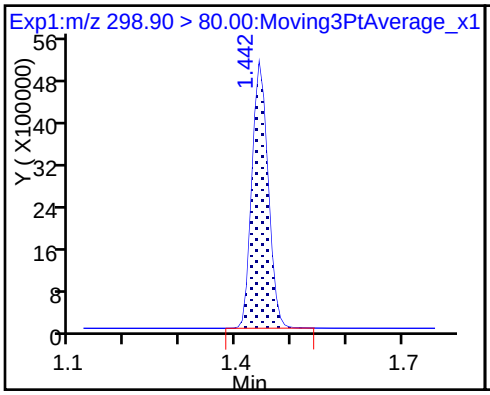
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7

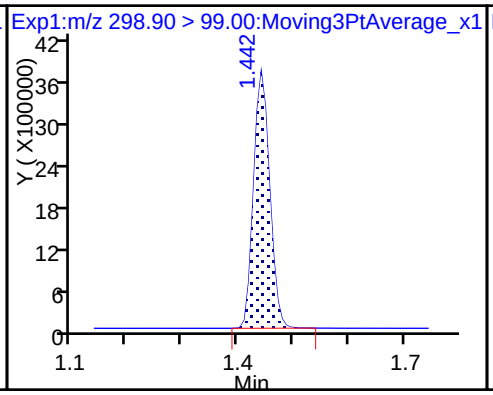
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

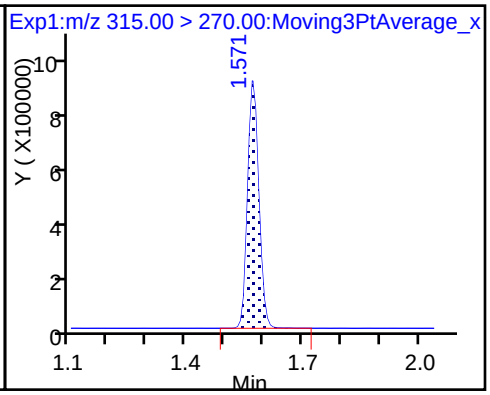
1 Perfluorobutanesulfonic acid



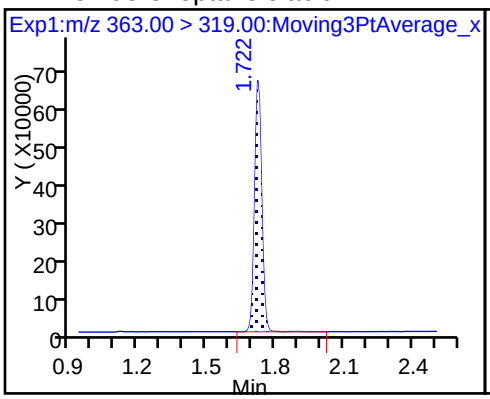
1 Perfluorobutanesulfonic acid



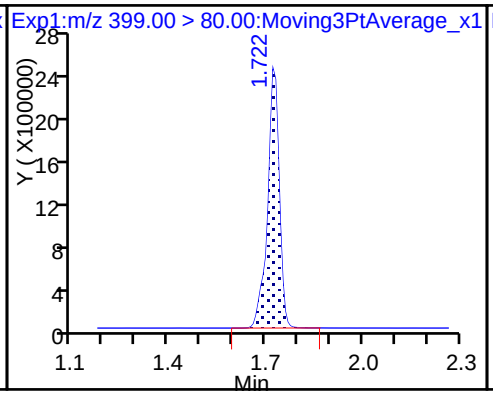
$ 2 13C2 PFHxA



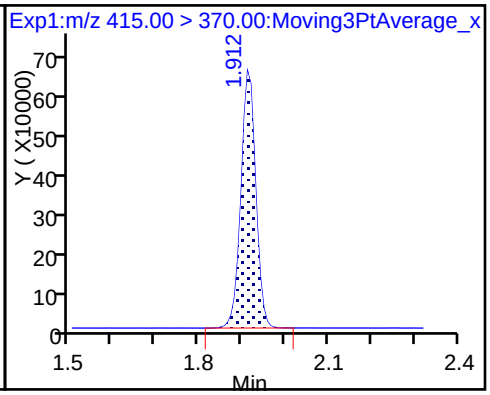
4 Perfluoroheptanoic acid



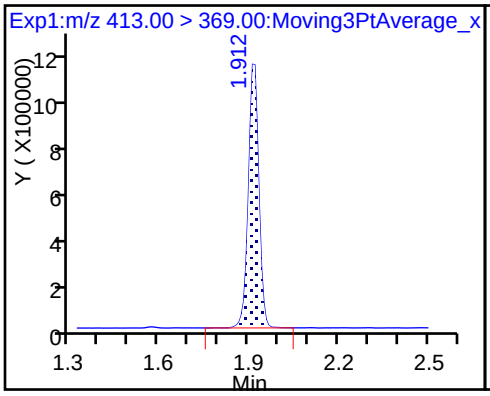
3 Perfluorohexanesulfonic acid



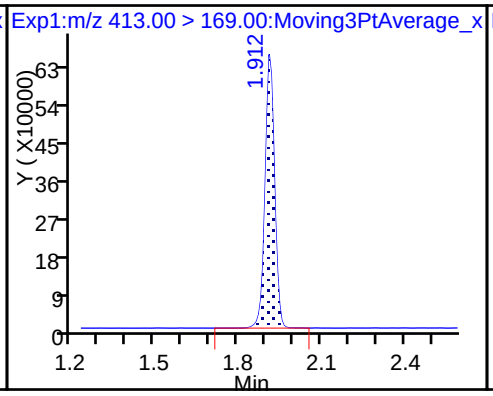
* 6 13C2-PFOA



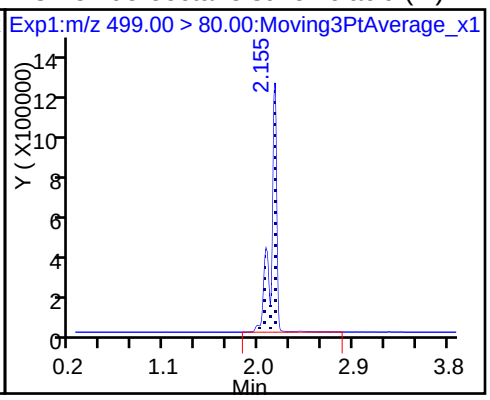
5 Perfluorooctanoic acid



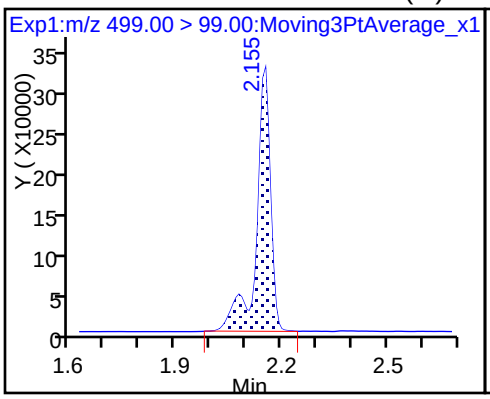
5 Perfluorooctanoic acid



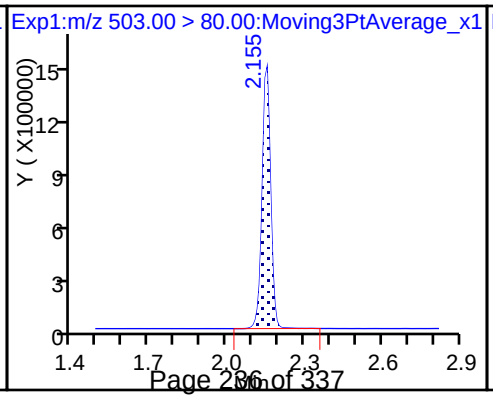
8 Perfluorooctane sulfonic acid (M)



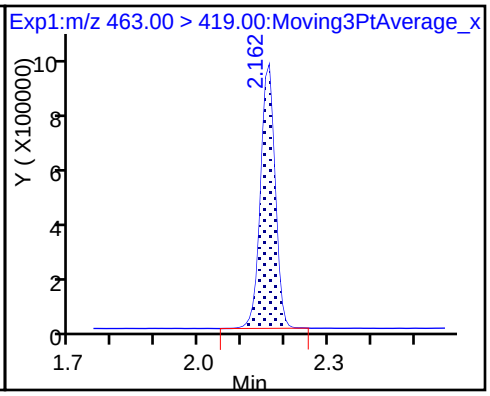
8 Perfluorooctane sulfonic acid (M)



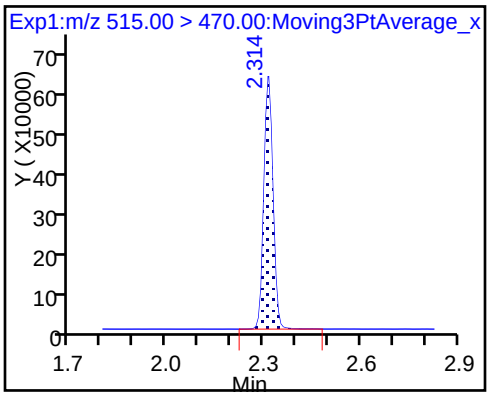
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.314
Y (X10000)
70
60
50
40
30
20
10
0
1.7
2.0
2.3
2.6
2.9
Min

TestAmerica Sacramento

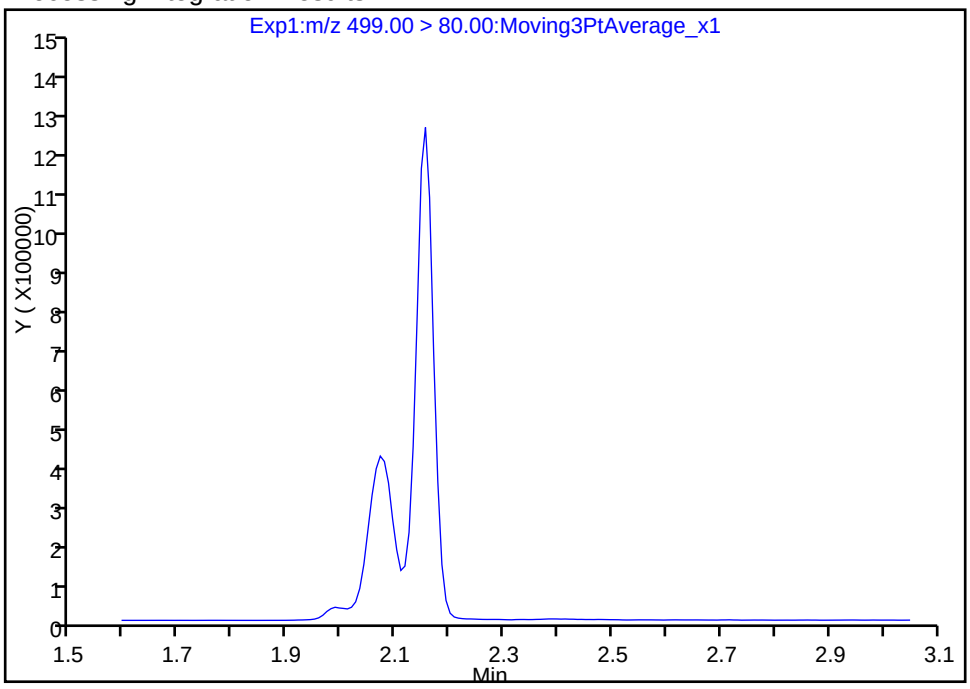
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_007.d
Injection Date: 03-Nov-2017 13:52:00 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

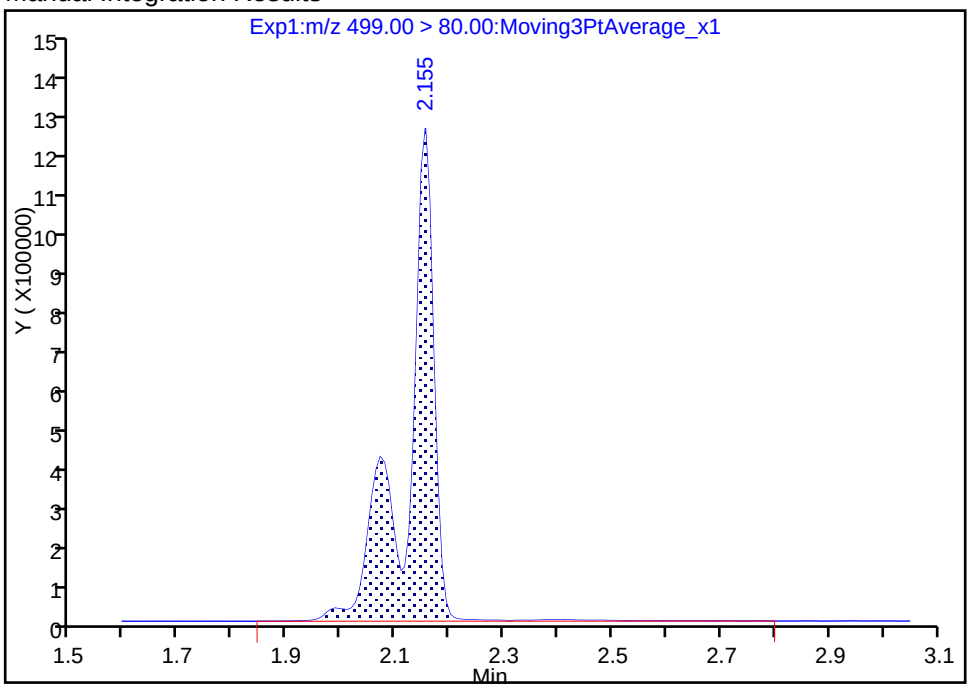
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 4363079
Amount: 39.491903
Amount Units: ng/ml



Reviewer: phomsophat, 06-Nov-2017 07:20:12
Audit Action: Assigned Compound ID Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

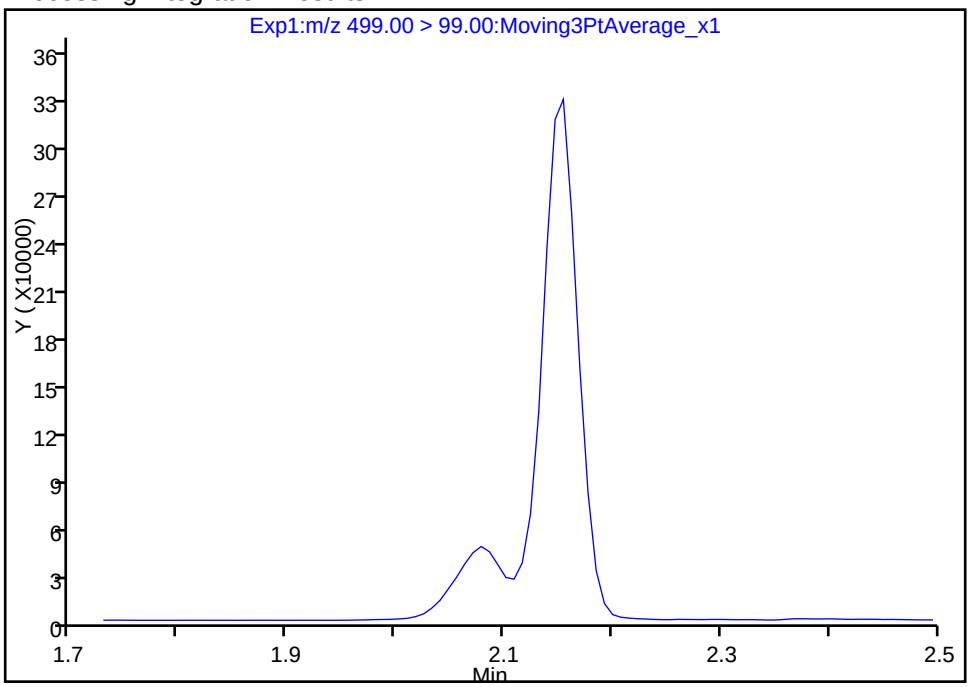
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_007.d
Injection Date: 03-Nov-2017 13:52:00 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

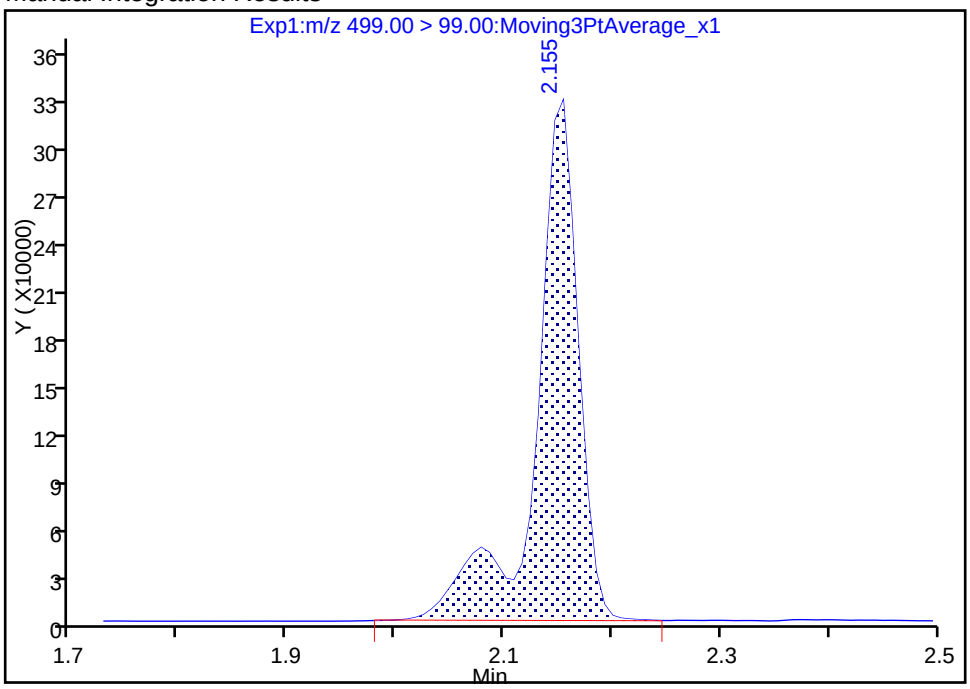
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 902486
Amount: 39.491903
Amount Units: ng/ml



Reviewer: phomsophat, 06-Nov-2017 07:20:20
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

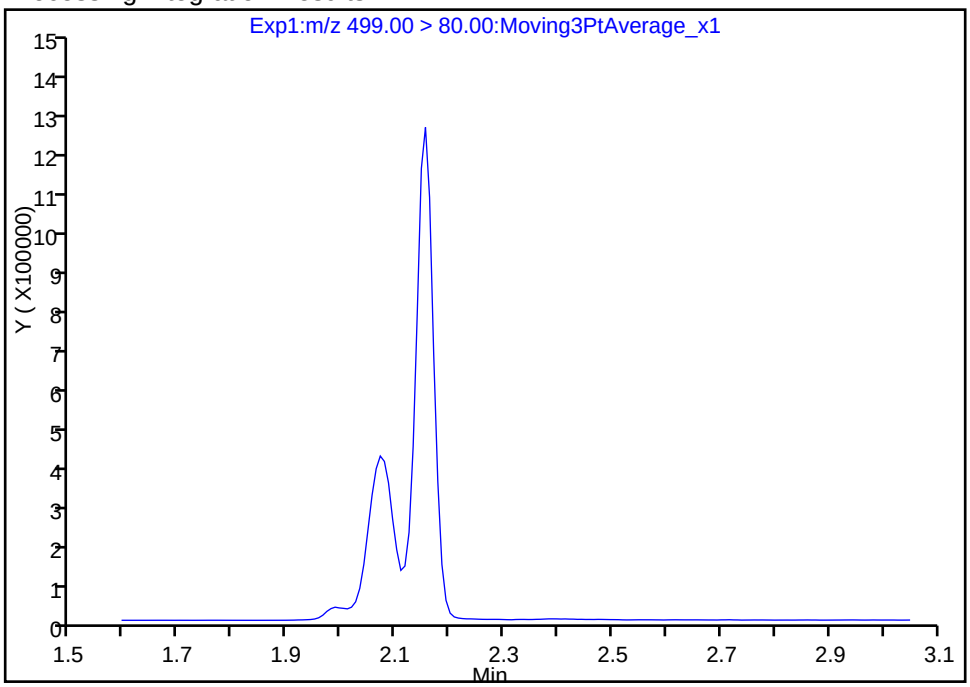
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_007.d
Injection Date: 03-Nov-2017 13:52:00 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

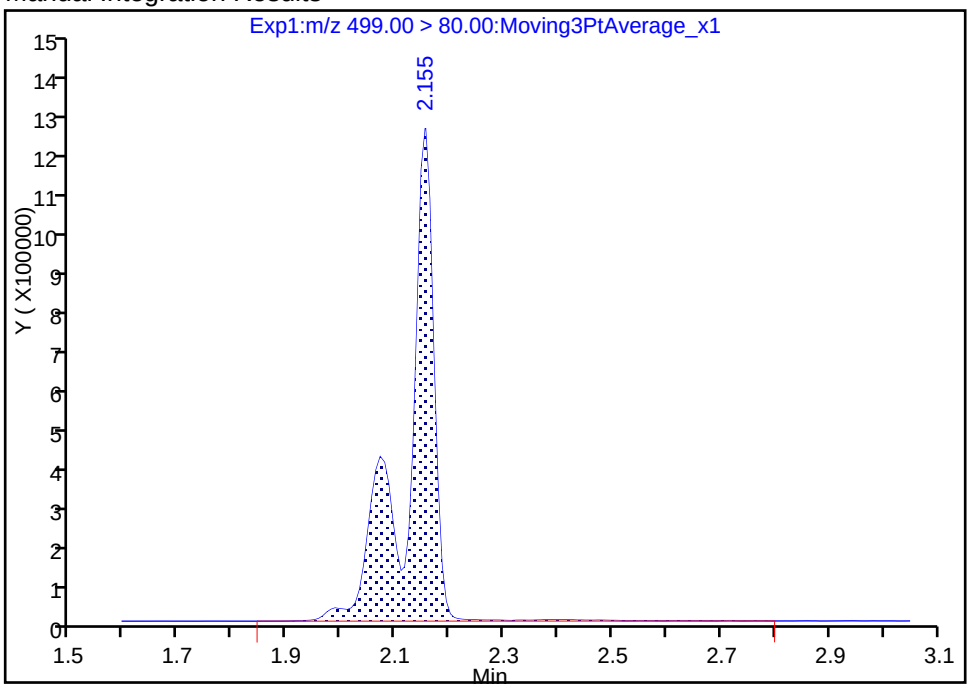
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 4363079
Amount: 39.491903
Amount Units: ng/ml



Reviewer: phomsophat, 06-Nov-2017 07:20:20
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_008.d
Lims ID: IC L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 03-Nov-2017 13:56:41 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 07-Nov-2017 15:52:11 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:21:19

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.444	-0.002	1.000	14011858	137.5		6452	
298.90 > 99.00	1.442	1.444	-0.002	1.000	10411479		1.35(0.00-0.00)	14800	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.573	-0.003	1.000	1675220	9.79		9525	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.725	-0.003	1.000	8413133	45.0		9078	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.725	-0.003	1.000	2102676	14.4		562	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.913	-0.001		1555174	10.0		6769	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.914	-0.002	1.000	4257225	29.6		800	
413.00 > 169.00	1.912	1.914	-0.002	1.000	2294552		1.86(0.00-0.00)	2838	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.147	2.147	0.0	1.000	6504279	62.1		5682	
499.00 > 99.00	2.147	2.147	0.0	1.000	1339120		4.86(0.00-0.00)	2329	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.151	-0.004		3199479	28.7		4946	
9 Perfluorononanoic acid									
463.00 > 419.00	2.155	2.158	-0.003	1.000	3023088	29.3		870	
$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.312	0.002	1.000	1139992	9.58		5885	

Reagents:

LC537-L5_00024 Amount Added: 1.00 Units: mL

Report Date: 07-Nov-2017 15:52:11 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_008.d

Injection Date: 03-Nov-2017 13:56:41 Instrument ID: A8_N

Lims ID: IC L5

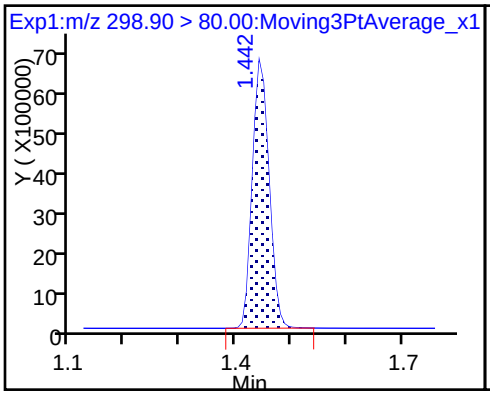
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8

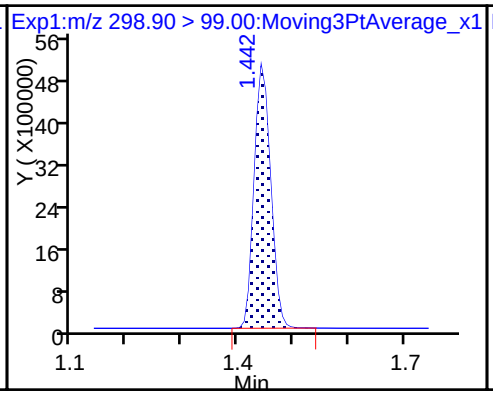
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

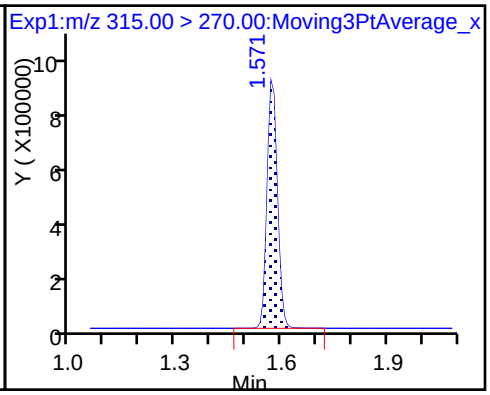
1 Perfluorobutanesulfonic acid



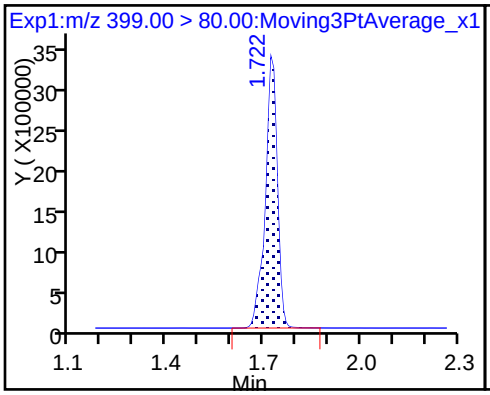
1 Perfluorobutanesulfonic acid



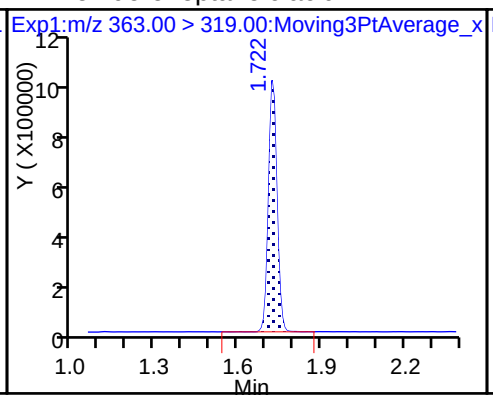
$ 2 13C2 PFHxA



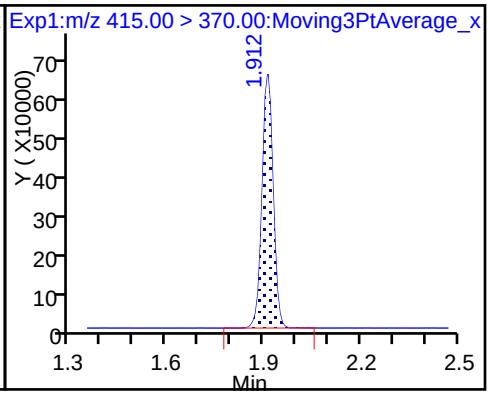
3 Perfluorohexanesulfonic acid



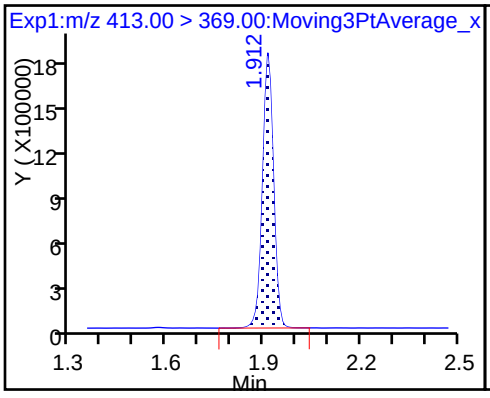
4 Perfluoroheptanoic acid



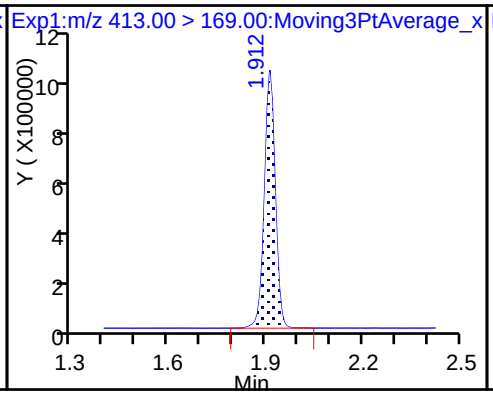
* 6 13C2-PFOA



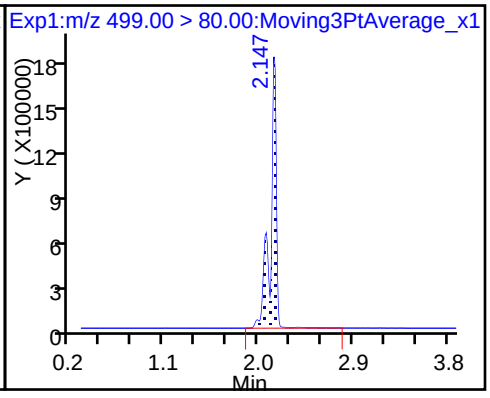
5 Perfluorooctanoic acid



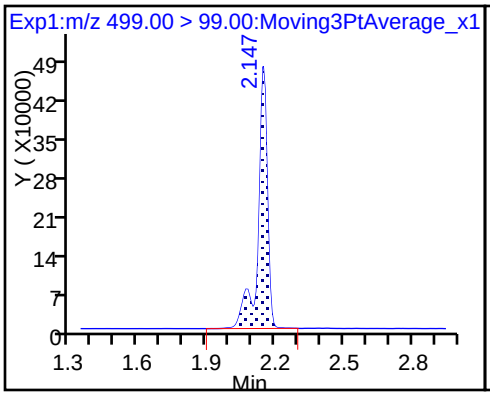
5 Perfluorooctanoic acid



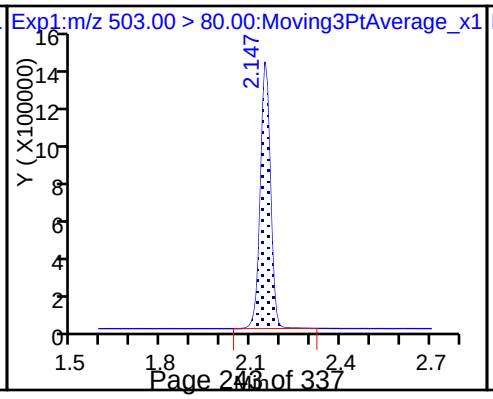
8 Perfluorooctane sulfonic acid



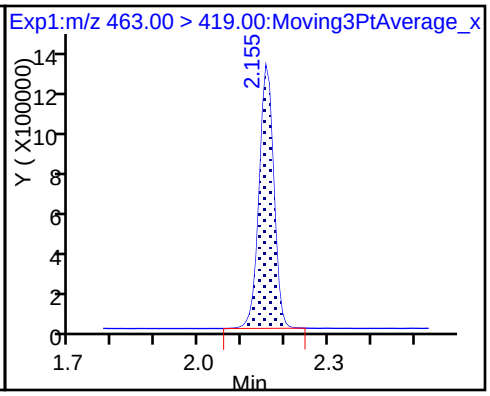
8 Perfluorooctane sulfonic acid



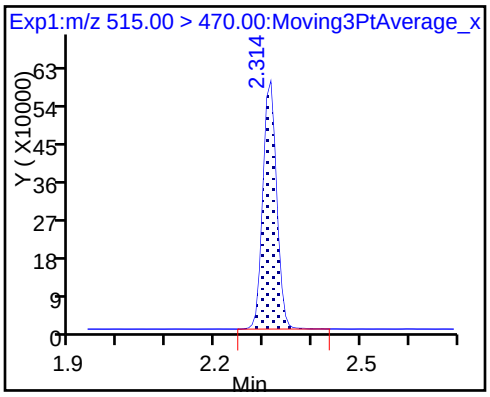
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.314
Y (X10000)
63
54
45
36
27
18
9
0
1.9
2.2
2.5
Min

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
Lims ID: IC L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 03-Nov-2017 14:01:24 ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 07-Nov-2017 15:52:12 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:25:41

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.444	-0.002	1.000	16699152	179.1		7089	
298.90 > 99.00	1.442	1.444	-0.002	1.000	12929978		1.29(0.00-0.00)	15608	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.573	-0.003	1.000	1664260	10.6		9116	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.725	-0.003	1.000	2810797	21.0		763	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.725	-0.003	1.000	11071993	60.4		10884	
* 6 13C2-PFOA									
415.00 > 370.00	1.904	1.913	-0.009		1426806	10.0		5446	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.914	-0.002	1.000	5597122	42.4		962	
413.00 > 169.00	1.904	1.914	-0.010	0.996	3028676		1.85(0.00-0.00)	3704	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.147	2.147	0.0	1.000	8679676	84.4		6114	
499.00 > 99.00	2.147	2.147	0.0	1.000	1807143		4.80(0.00-0.00)	2991	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.151	-0.004		3141787	28.7		4961	
9 Perfluorononanoic acid									
463.00 > 419.00	2.155	2.158	-0.003	1.000	4019666	42.4		1149	
$ 10 13C2 PFDA									
515.00 > 470.00	2.306	2.312	-0.006	1.000	1164156	10.7		6124	

Reagents:

LC537-L6_00020 Amount Added: 1.00 Units: mL

Report Date: 07-Nov-2017 15:52:12 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Injection Date: 03-Nov-2017 14:01:24 Instrument ID: A8_N

Lims ID: IC L6

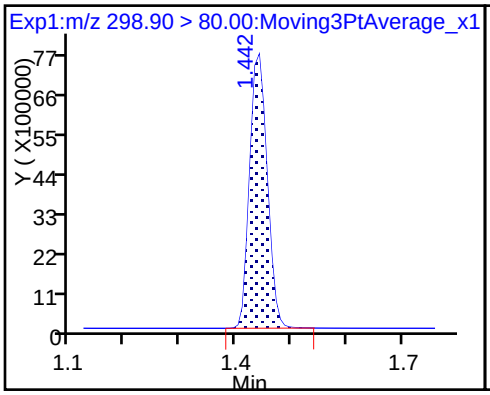
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 9

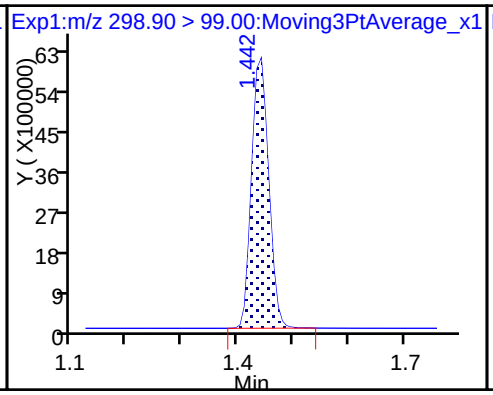
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

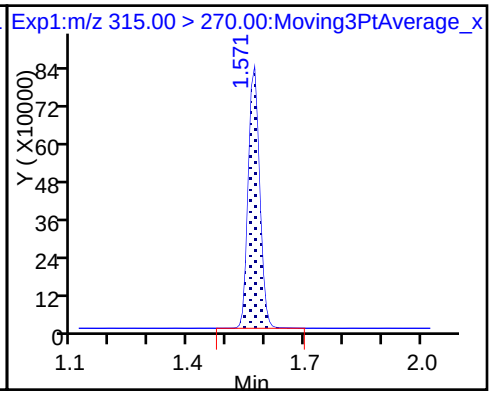
1 Perfluorobutanesulfonic acid



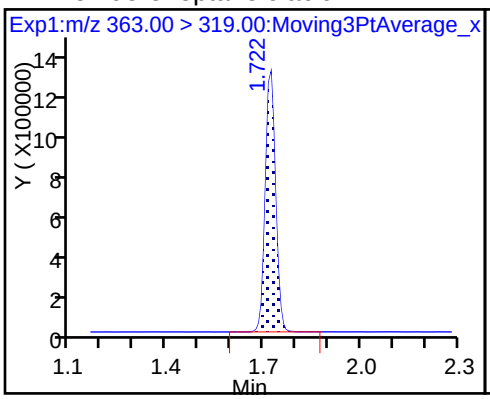
1 Perfluorobutanesulfonic acid



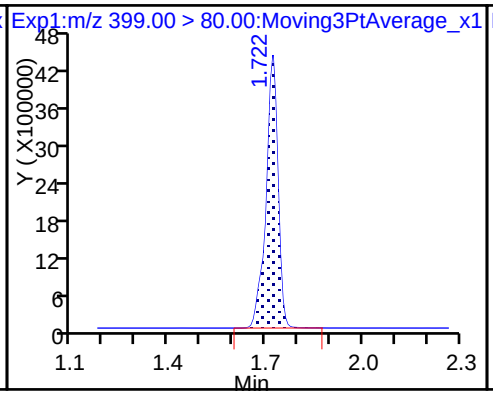
$ 2 13C2 PFHxA



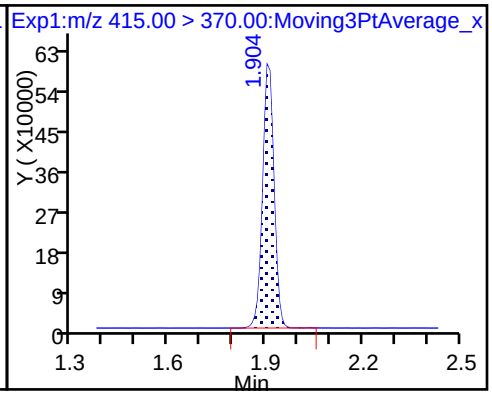
4 Perfluoroheptanoic acid



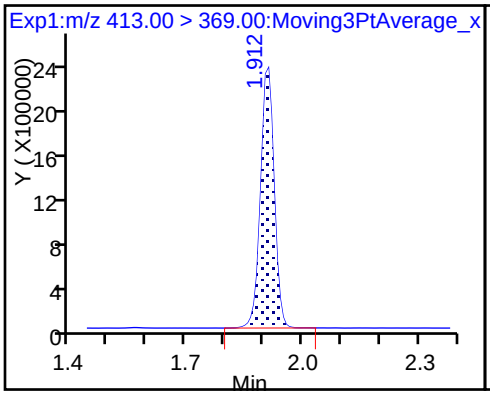
3 Perfluorohexanesulfonic acid



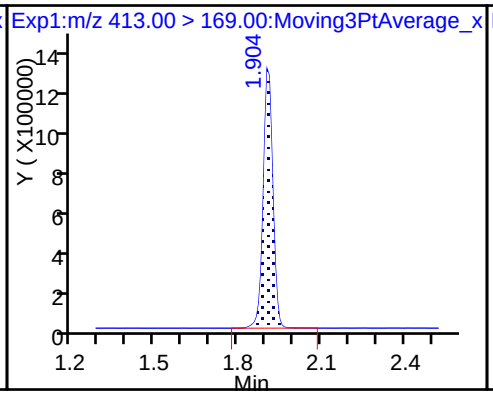
* 6 13C2-PFOA



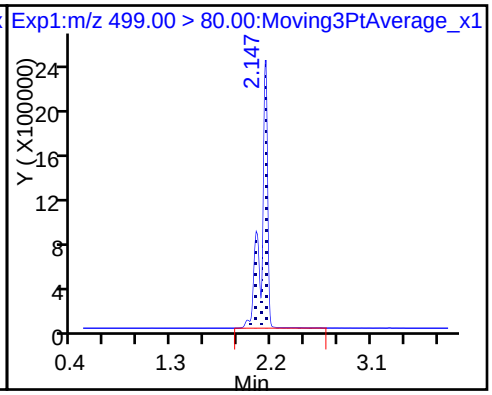
5 Perfluorooctanoic acid



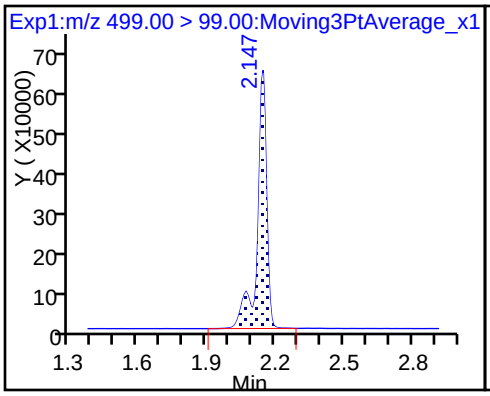
5 Perfluorooctanoic acid



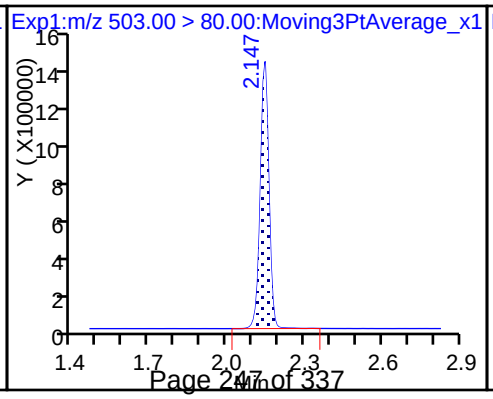
8 Perfluorooctane sulfonic acid



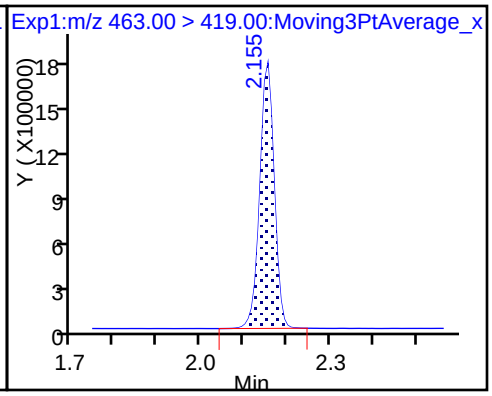
8 Perfluorooctane sulfonic acid



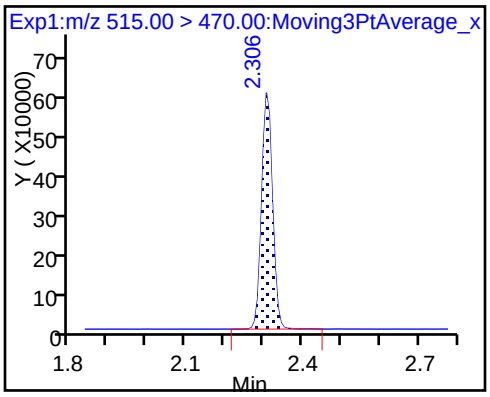
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.306
Y (X10000)
70
60
50
40
30
20
10
0
1.8
2.1
2.4
2.7
Min

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Lab Sample ID: CCVL 320-192908/11 Calibration Date: 11/03/2017 14:10

Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/03/2017 14:01

Lab File ID: 2017.11.03_537XICAL_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.109		20.4	20.0	1.9	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9382		2.23	2.22	0.1	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.688		6.72	6.67	0.8	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8825		4.24	4.45	-4.7	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9176		8.69	8.89	-2.3	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6625		4.43	4.45	-0.2	50.0
13C2 PFHxA	Ave	1.100	1.068		9.70	10.0	-3.0	30.0
13C2 PFDA	Ave	0.7652	0.7460		9.75	10.0	-2.5	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_011.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 03-Nov-2017 14:10:44 ALS Bottle#: 2 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L2
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 07-Nov-2017 15:39:07 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:26:29

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.449	1.444	0.005	1.000	2556738	20.4		1537	
298.90 > 99.00	1.449	1.444	0.005	1.000	1750170		1.46(0.00-0.00)	4023	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.573	0.005	1.000	1694196	9.70		8915	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.730	1.725	0.005	1.000	1297654	6.72		2410	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.730	1.725	0.005	1.000	330927	2.23		99.4	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.913	-0.001		1586829	10.0		6840	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.914	-0.002	1.000	622915	4.24		116	
413.00 > 169.00	1.912	1.914	-0.002	1.000	335080		1.86(0.00-0.00)	460	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.155	2.147	0.008	1.000	940397	8.69		528	
499.00 > 99.00	2.147	2.147	0.0	0.996	196397		4.79(0.00-0.00)	430	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.151	-0.004		3305852	28.7		5135	
9 Perfluorononanoic acid									
463.00 > 419.00	2.162	2.158	0.004	1.000	467323	4.43		143	
$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.312	0.002	1.000	1183747	9.75		6763	

Reagents:

LC537-L2_00020 Amount Added: 1.00 Units: mL

Report Date: 07-Nov-2017 15:39:08 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_011.d

Injection Date: 03-Nov-2017 14:10:44 Instrument ID: A8_N

Lims ID: CCVL

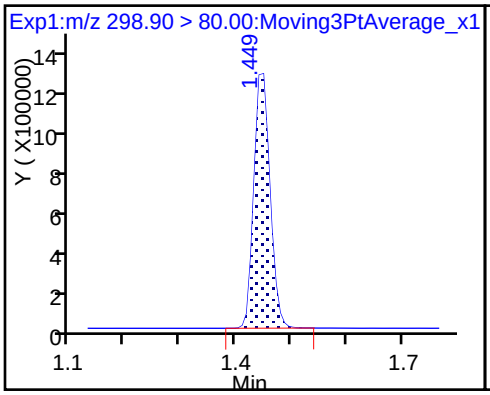
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 11

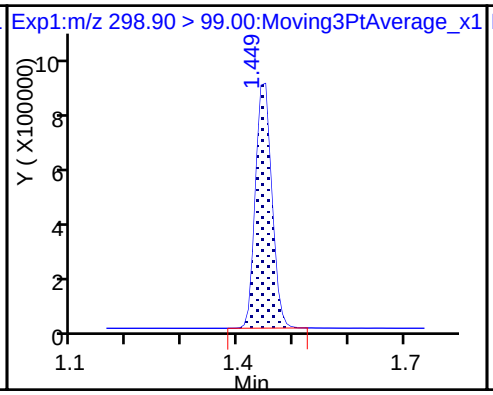
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

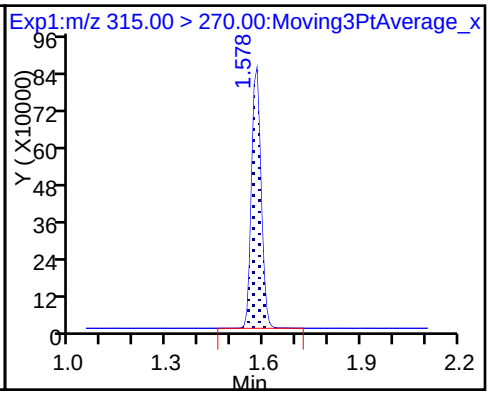
1 Perfluorobutanesulfonic acid



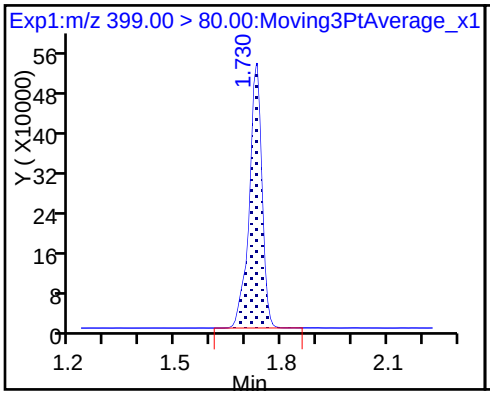
1 Perfluorobutanesulfonic acid



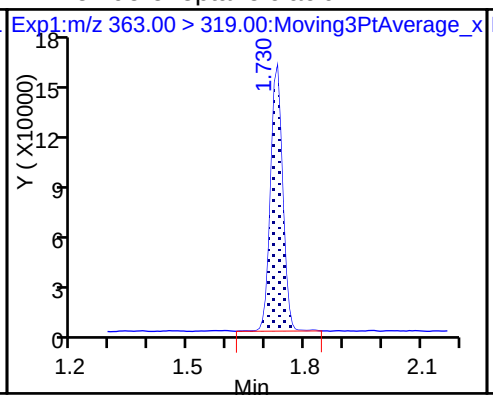
$ 2 13C2 PFHxA



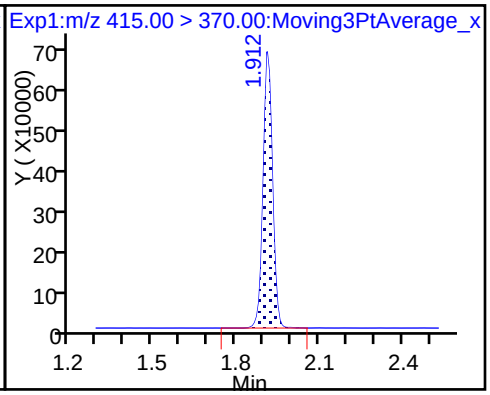
3 Perfluorohexanesulfonic acid



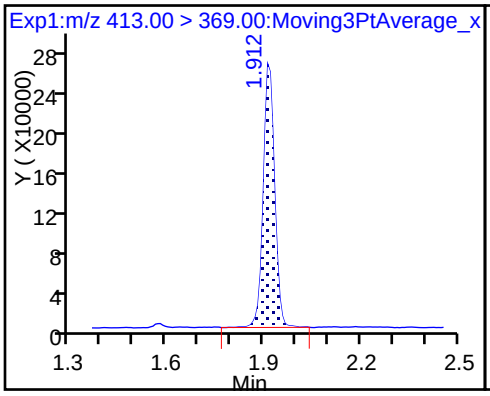
4 Perfluoroheptanoic acid



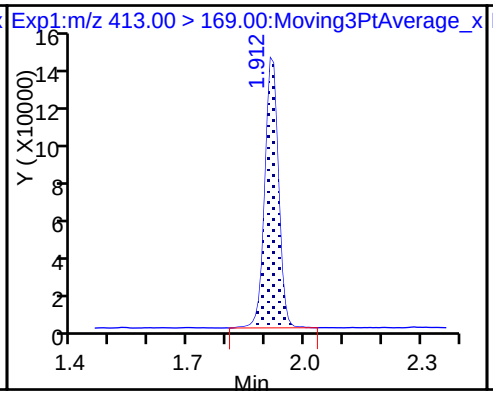
* 6 13C2-PFOA



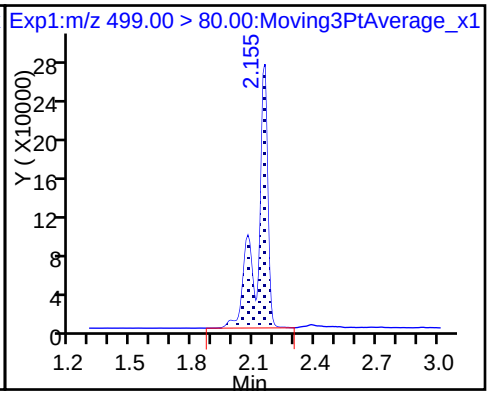
5 Perfluorooctanoic acid



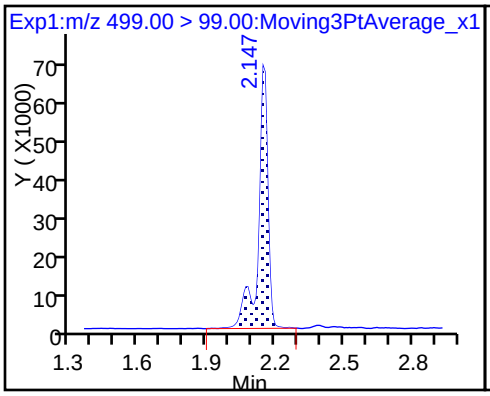
5 Perfluorooctanoic acid



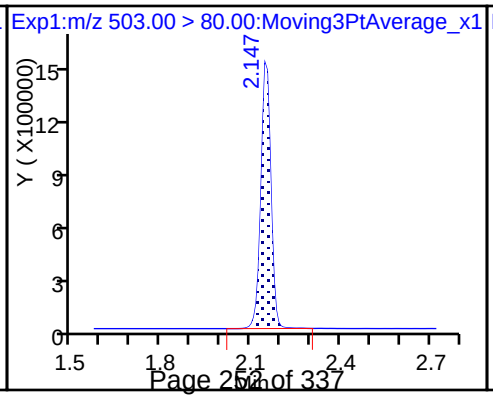
8 Perfluorooctane sulfonic acid



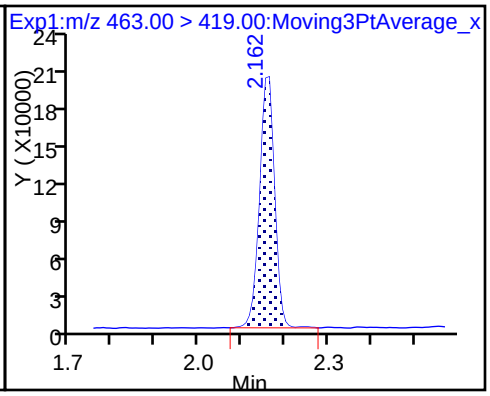
8 Perfluorooctane sulfonic acid



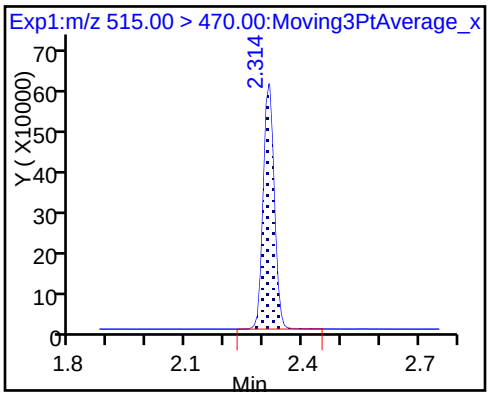
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.314
Y (X10000)
70
60
50
40
30
20
10
0
1.8
2.1
2.4
2.7
Min

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Lab Sample ID: ICV 320-192908/13 Calibration Date: 11/03/2017 14:20

Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/03/2017 14:01

Lab File ID: 2017.11.03_537XICAL_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.8310		83.7	100	-16.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.8136		8.68	10.0	-13.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.463		17.5	20.1	-12.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.7995		17.7	20.5	-13.6	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.8637		18.1	19.7	-8.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6428		19.5	20.1	-3.2	30.0
13C2 PFHxA	Ave	1.100	1.039		9.44	10.0	-5.6	30.0
13C2 PFDA	Ave	0.7652	0.7391		9.66	10.0	-3.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_013.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 03-Nov-2017 14:20:03 ALS Bottle#: 7 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 07-Nov-2017 15:39:08 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:27:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.444	-0.002	1.000	9960387	83.7		4998	
298.90 > 99.00	1.442	1.444	-0.002	1.000	7235967		1.38(0.00-0.00)	13514	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.573	-0.003	1.000	1570629	9.44		8393	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.725	-0.003	1.000	3517469	17.5		5659	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.725	-0.003	1.000	1229696	8.68		345	
* 6 13C2-PFOA									
415.00 > 370.00	1.904	1.913	-0.009		1512045	10.0		7643	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.904	1.914	-0.010	1.000	2476221	17.7		475	
413.00 > 169.00	1.904	1.914	-0.010	1.000	1327388		1.87(0.00-0.00)	1724	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.140	2.147	-0.007	1.000	2036944	18.1		2323	
499.00 > 99.00	2.140	2.147	-0.007	1.000	389736		5.23(0.00-0.00)	830	
* 7 13C4 PFOS									
503.00 > 80.00	2.140	2.151	-0.011		3433628	28.7		5334	
9 Perfluorononanoic acid									
463.00 > 419.00	2.147	2.158	-0.011	1.000	1956116	19.5		652	
$ 10 13C2 PFDA									
515.00 > 470.00	2.306	2.312	-0.006	1.000	1117553	9.66		6230	

Reagents:

LC537-ICV_00028 Amount Added: 1.00 Units: mL

Report Date: 07-Nov-2017 15:39:08 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_013.d

Injection Date: 03-Nov-2017 14:20:03 Instrument ID: A8_N

Lims ID: ICV

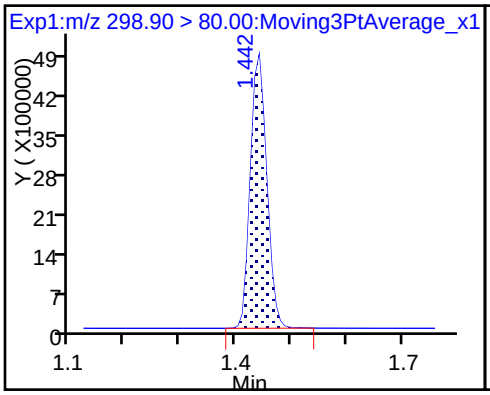
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 7 Worklist Smp#: 13

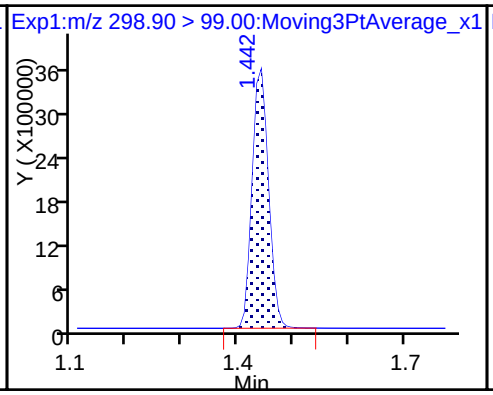
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

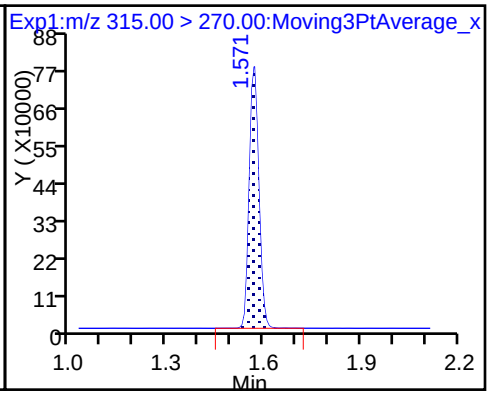
1 Perfluorobutanesulfonic acid



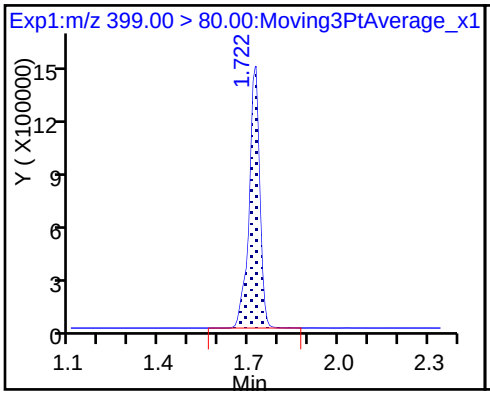
1 Perfluorobutanesulfonic acid



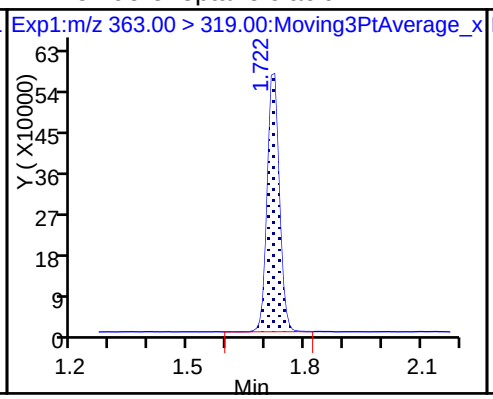
$ 2 13C2 PFHxA



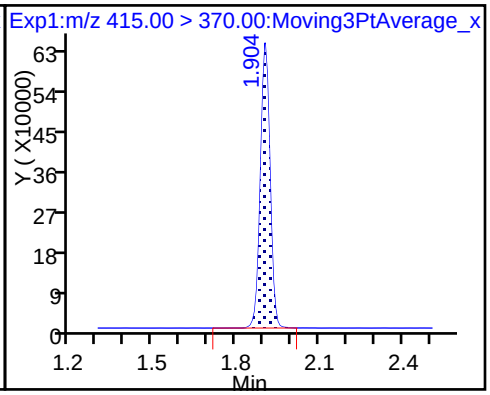
3 Perfluorohexanesulfonic acid



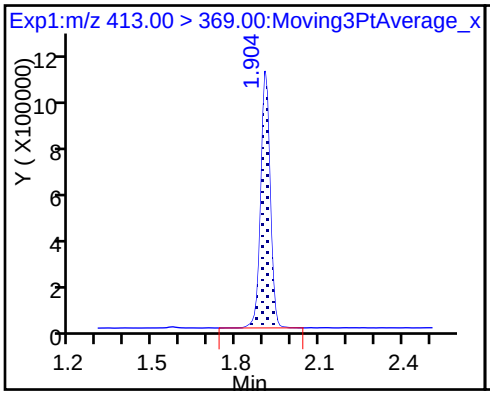
4 Perfluoroheptanoic acid



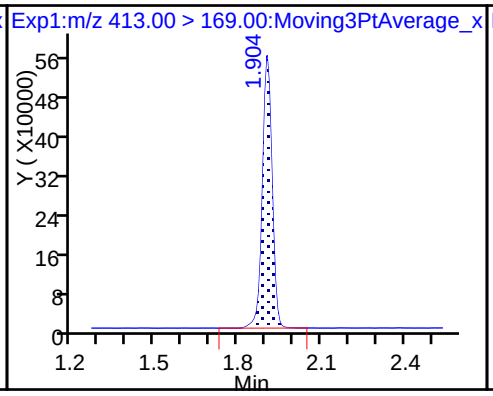
* 6 13C2-PFOA



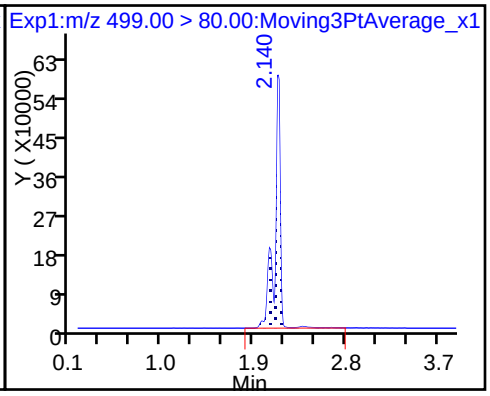
5 Perfluorooctanoic acid



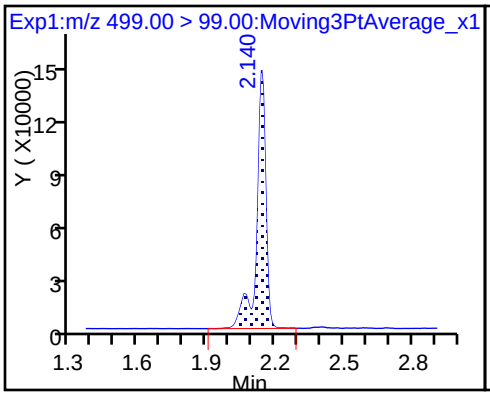
5 Perfluorooctanoic acid



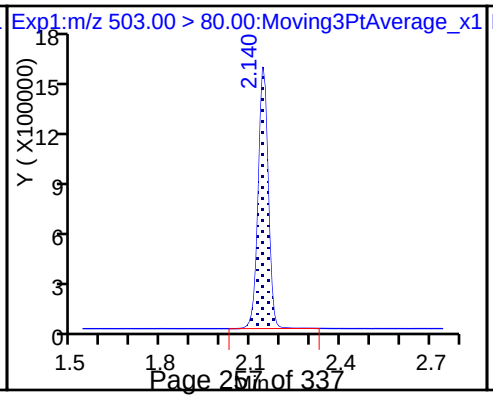
8 Perfluorooctane sulfonic acid



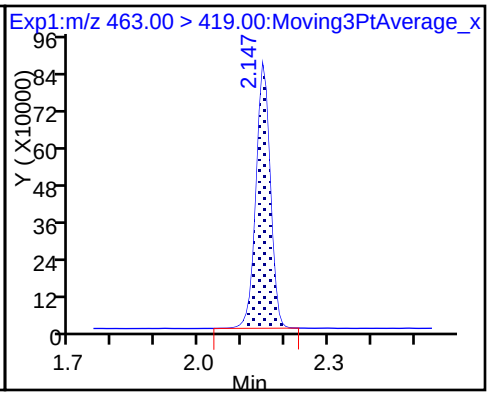
8 Perfluorooctane sulfonic acid



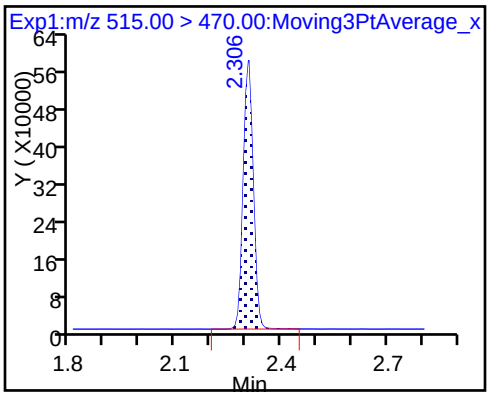
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.306
Y (X10000)
64
56
48
40
32
24
16
8
0
1.8
2.1
2.4
2.7
Min

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Lab Sample ID: CCVL 320-194241/1 Calibration Date: 11/13/2017 02:37

Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/03/2017 14:01

Lab File ID: 2017.11.13_537A_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.127		20.7	20.0	3.5	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9071		2.15	2.22	-3.2	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.664		6.63	6.67	-0.6	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9135		4.39	4.45	-1.3	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9202		8.71	8.89	-2.0	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6934		4.64	4.45	4.4	50.0
13C2 PFHxA	Ave	1.100	1.120		10.2	10.0	1.8	30.0
13C2 PFDA	Ave	0.7652	0.7392		9.66	10.0	-3.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_004.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 13-Nov-2017 02:37:12 ALS Bottle#: 2 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCVL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:11:55 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: phomsophat Date: 13-Nov-2017 11:10:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.434	1.444	-0.010	1.000	2524556	20.7		1421	
298.90 > 99.00	1.434	1.444	-0.010	1.000	1791255		1.41(0.00-0.00)	5607	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1751391	10.2		6634	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.707	1.725	-0.018	1.000	1242810	6.63		1599	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.707	1.725	-0.018	1.000	315213	2.15		101	
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.913	-0.024		1563386	10.0		4561	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.897	1.914	-0.017	1.000	635278	4.39		125	
413.00 > 169.00	1.897	1.914	-0.017	1.000	343526		1.85(0.00-0.00)	386	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.132	2.117	0.015	1.000	916453	8.71		821	M
499.00 > 99.00	2.132	2.117	0.015	1.000	187137		4.90(0.00-0.00)	486	M
* 7 13C4 PFOS									
503.00 > 80.00	2.132	2.151	-0.019		3212610	28.7		4707	
9 Perfluorononanoic acid									
463.00 > 419.00	2.140	2.158	-0.018	1.000	481909	4.64		176	
$ 10 13C2 PFDA									
515.00 > 470.00	2.299	2.312	-0.013	1.000	1155578	9.66		7334	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00020 Amount Added: 1.00 Units: mL

Report Date: 14-Nov-2017 17:11:55 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_004.d

Injection Date: 13-Nov-2017 02:37:12 Instrument ID: A8_N

Lims ID: CCVL

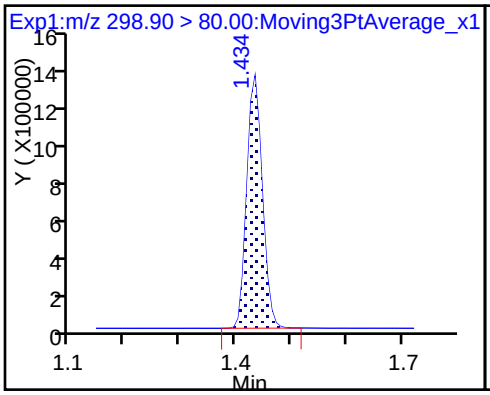
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 1

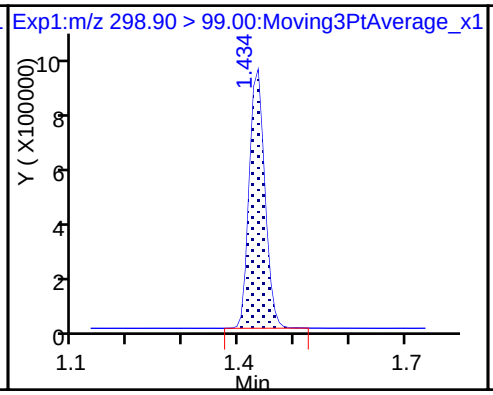
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

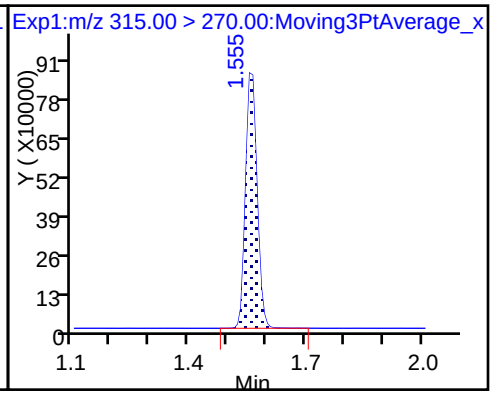
1 Perfluorobutanesulfonic acid



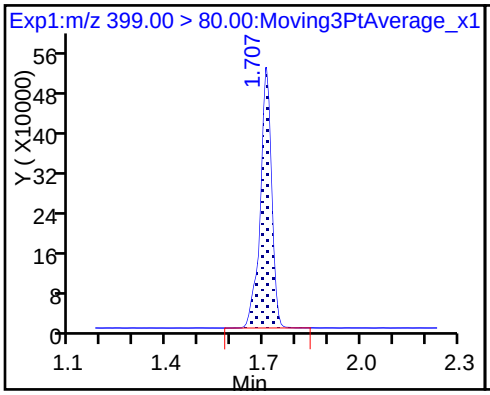
1 Perfluorobutanesulfonic acid



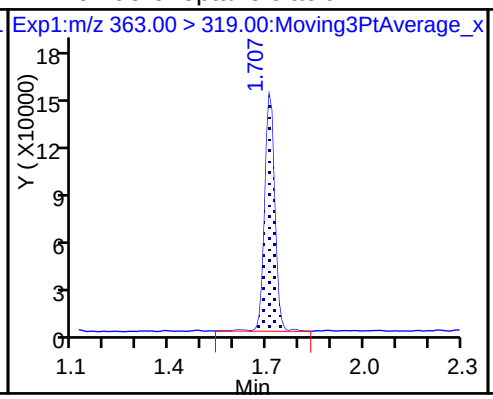
$ 2 13C2 PFHxA



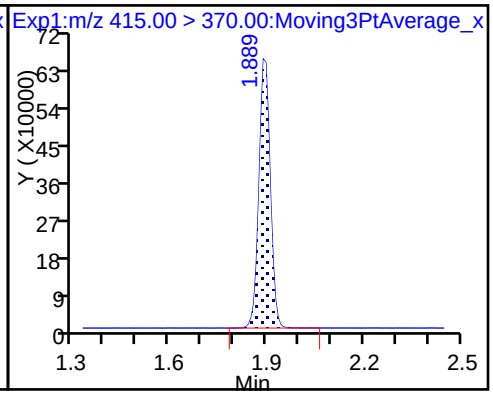
3 Perfluorohexanesulfonic acid



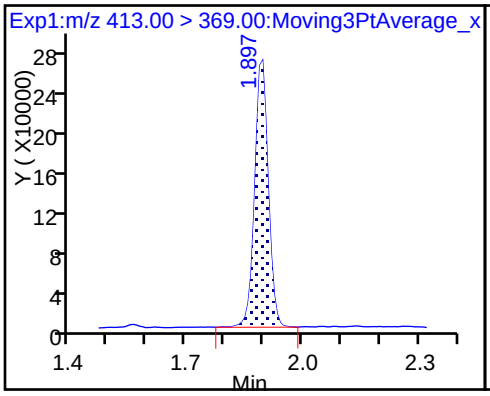
4 Perfluoroheptanoic acid



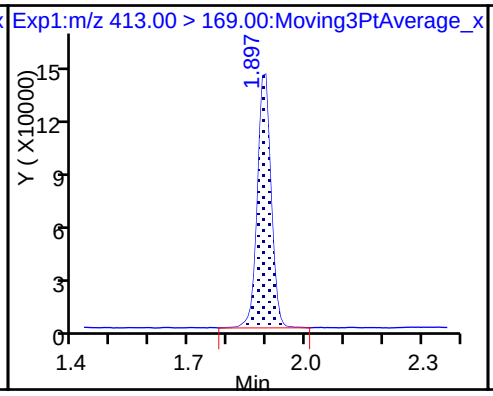
* 6 13C2-PFOA



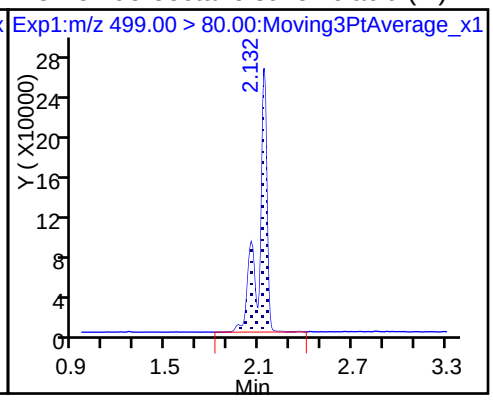
5 Perfluorooctanoic acid



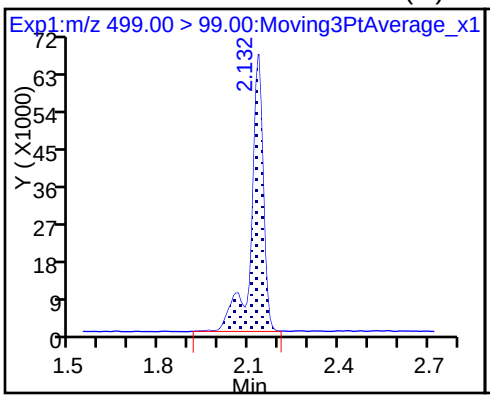
5 Perfluorooctanoic acid



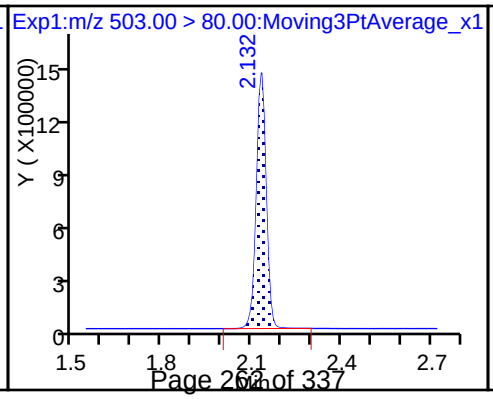
8 Perfluorooctane sulfonic acid (M)



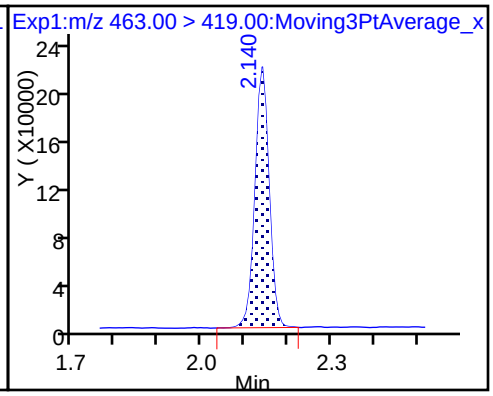
8 Perfluorooctane sulfonic acid (M)



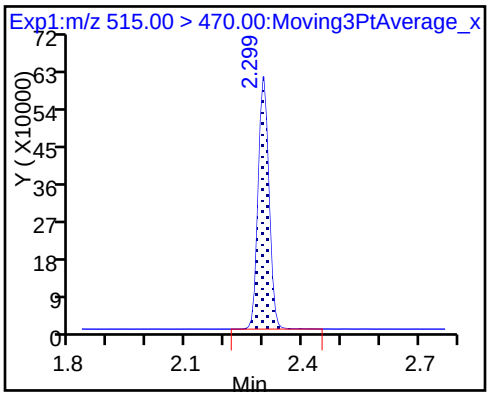
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.299
Y (X10000)
72
63
54
45
36
27
18
9
0
1.8
2.1
2.4
2.7
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

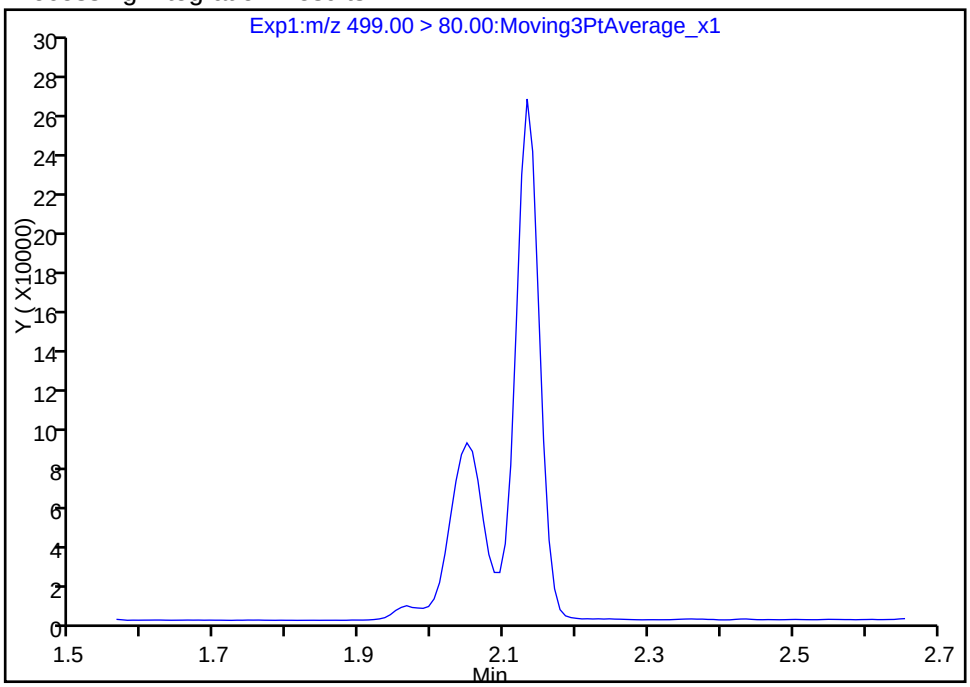
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_004.d
Injection Date: 13-Nov-2017 02:37:12 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

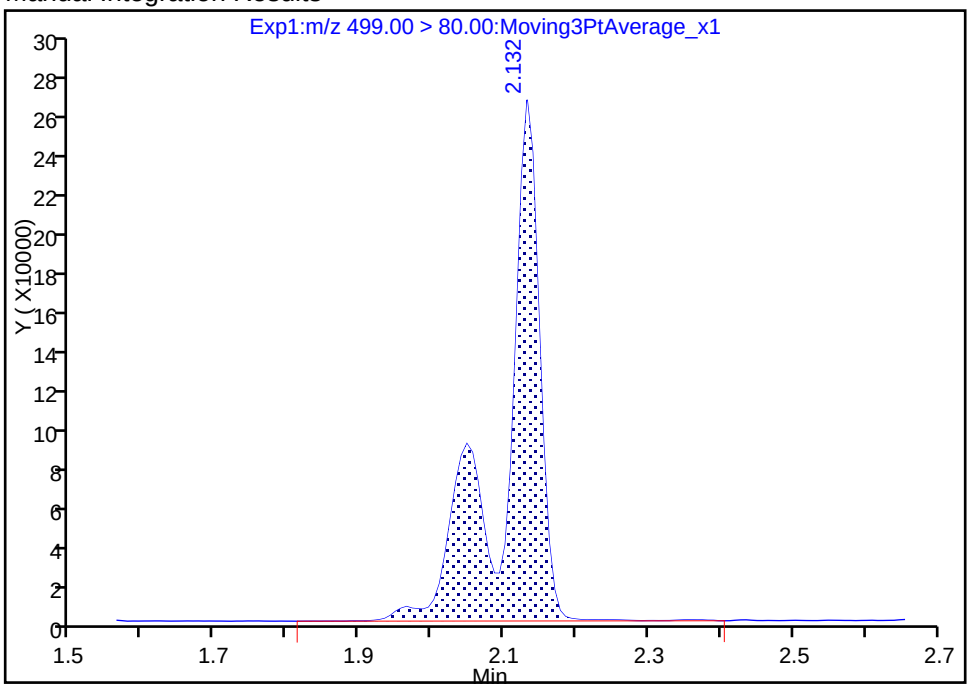
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.13
Area: 916453
Amount: 8.713437
Amount Units: ng/ml



Reviewer: phomsophat, 13-Nov-2017 11:09:29
Audit Action: Assigned Compound ID Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

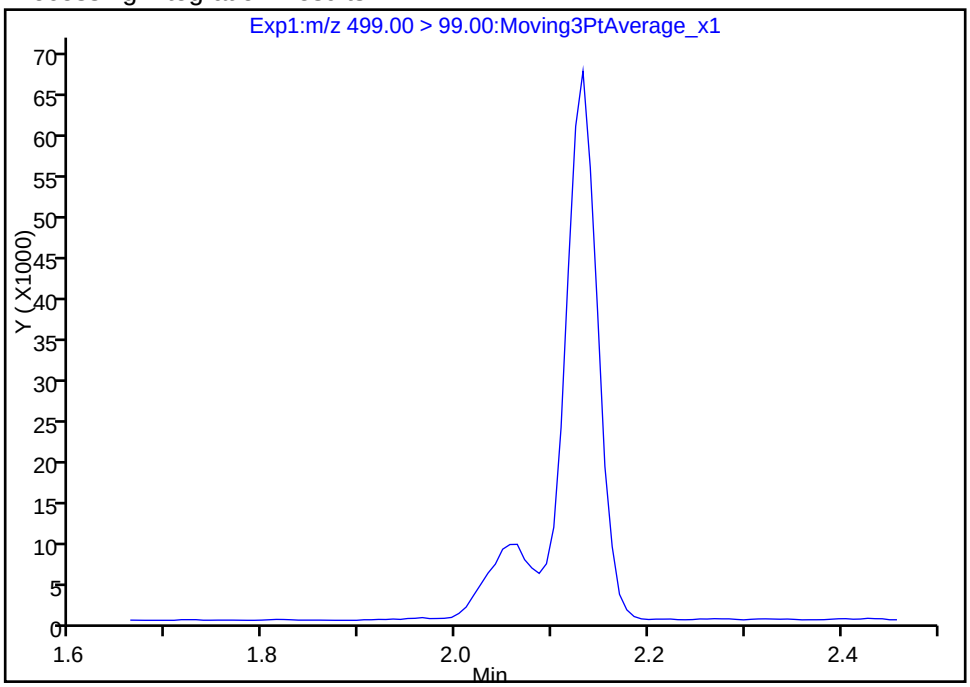
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_004.d
Injection Date: 13-Nov-2017 02:37:12 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

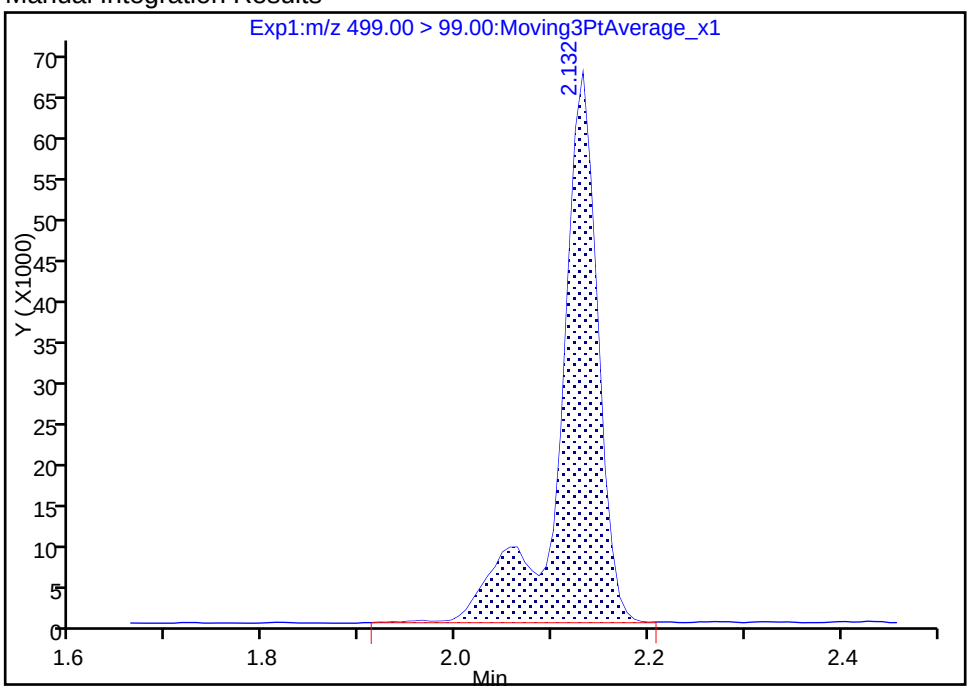
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.13
Area: 187137
Amount: 8.713437
Amount Units: ng/ml



Reviewer: phomsophat, 13-Nov-2017 11:09:50
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

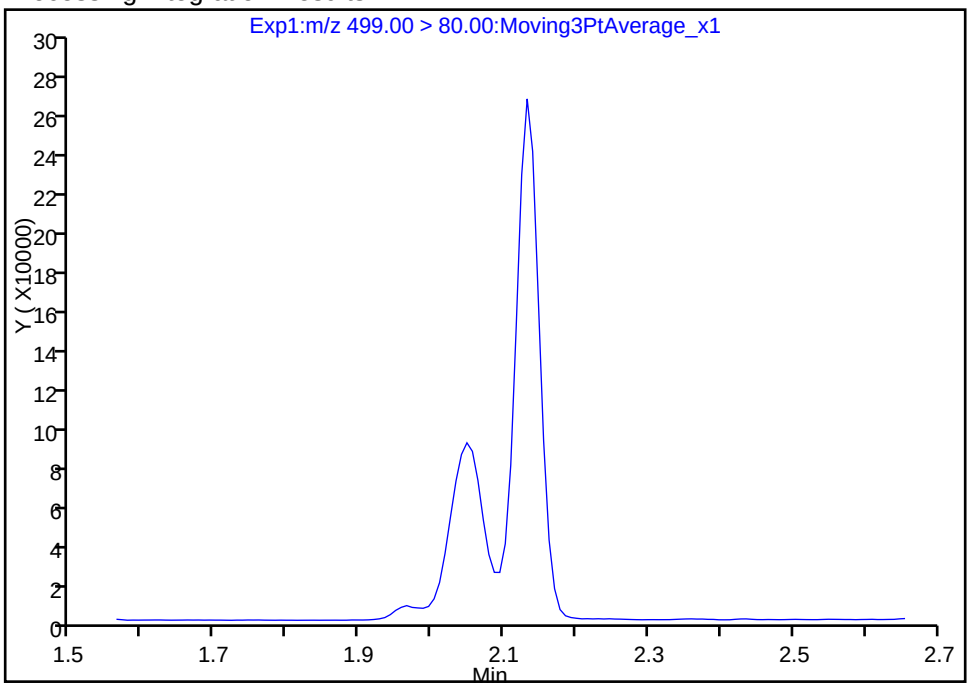
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_004.d
Injection Date: 13-Nov-2017 02:37:12 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

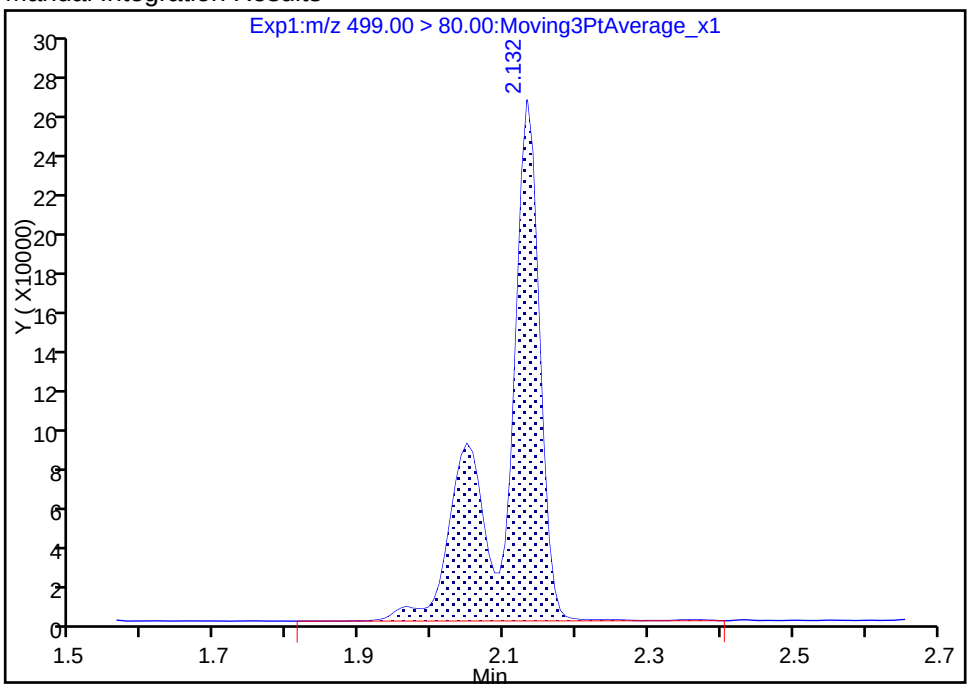
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.13
Area: 916453
Amount: 8.713437
Amount Units: ng/ml



Reviewer: phomsophat, 13-Nov-2017 11:09:50
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Lab Sample ID: CCV 320-194241/2 Calibration Date: 11/13/2017 02:41

Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/03/2017 14:01

Lab File ID: 2017.11.13_537A_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.145		49.3	45.0	9.5	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9151		4.88	5.00	-2.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.751		15.7	15.0	4.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9280		10.0	10.0	0.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9620		20.5	20.0	2.5	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6857		10.3	10.0	3.2	30.0
13C2 PFHxA	Ave	1.100	1.080		9.82	10.0	-1.8	30.0
13C2 PFDA	Ave	0.7652	0.7611		9.95	10.0	-0.5	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_005.d
Lims ID: CCV L3
Client ID:
Sample Type: CCVIS
Inject. Date: 13-Nov-2017 02:41:52 ALS Bottle#: 3 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L3
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 16:55:12

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.444	-0.018	1.000	5533265	49.3		2635	
298.90 > 99.00	1.426	1.444	-0.018	1.000	3864229		1.43(0.00-0.00)	8337	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1619081	9.82		5834	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.707	1.725	-0.018	1.000	2822101	15.7		3078	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.707	1.725	-0.018	1.000	686089	4.88		214	
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.913	-0.024		1499119	10.0		4637	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.897	1.914	-0.017	1.000	1392358	10.0		267	
413.00 > 169.00	1.897	1.914	-0.017	1.000	720417		1.93(0.00-0.00)	823	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.132	2.117	0.015	1.000	2067365	20.5		1645	M
499.00 > 99.00	2.132	2.117	0.015	1.000	409140		5.05(0.00-0.00)	923	M
* 7 13C4 PFOS									
503.00 > 80.00	2.132	2.151	-0.019		3081036	28.7		3979	
9 Perfluorononanoic acid									
463.00 > 419.00	2.140	2.158	-0.018	1.000	1028064	10.3		358	
$ 10 13C2 PFDA									
515.00 > 470.00	2.299	2.312	-0.013	1.000	1141043	9.95		5001	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00023 Amount Added: 1.00 Units: mL

Report Date: 14-Nov-2017 17:11:57 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_005.d

Injection Date: 13-Nov-2017 02:41:52 Instrument ID: A8_N

Lims ID: CCV L3

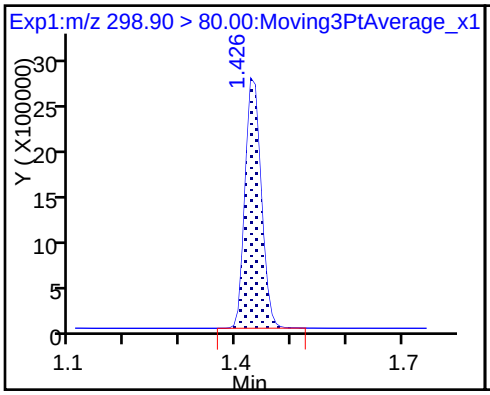
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 2

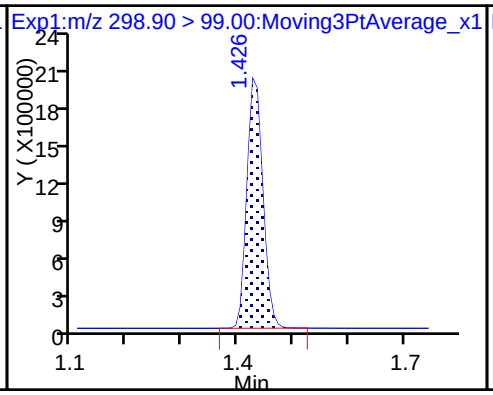
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

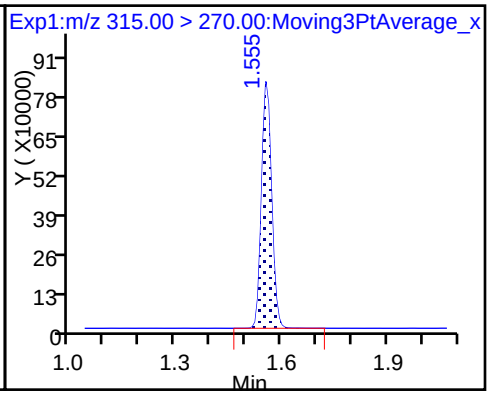
1 Perfluorobutanesulfonic acid



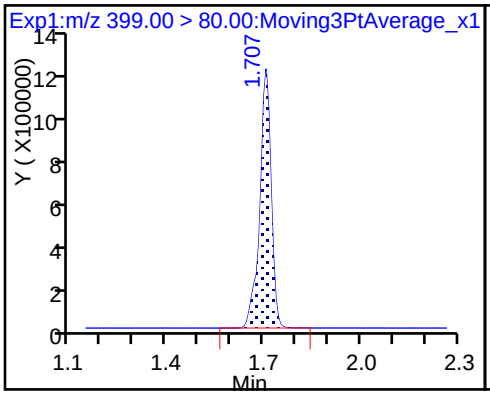
1 Perfluorobutanesulfonic acid



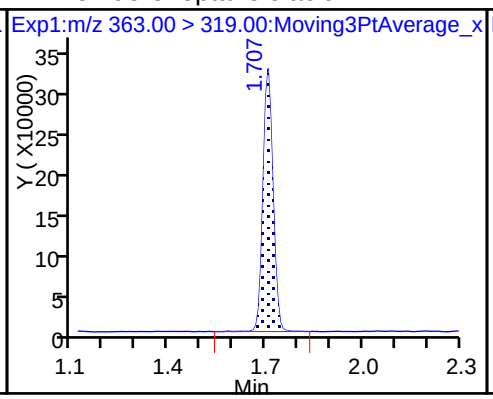
$ 2 13C2 PFHxA



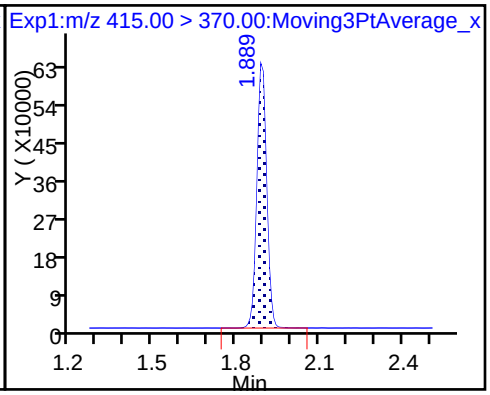
3 Perfluorohexanesulfonic acid



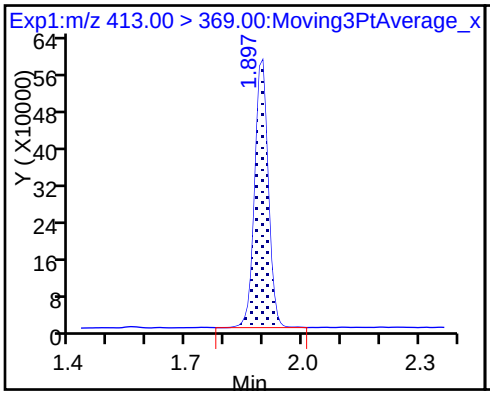
4 Perfluoroheptanoic acid



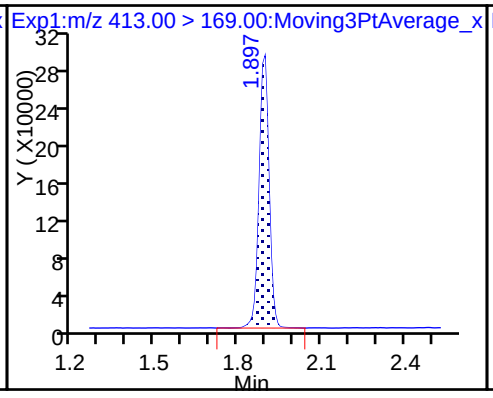
* 6 13C2-PFOA



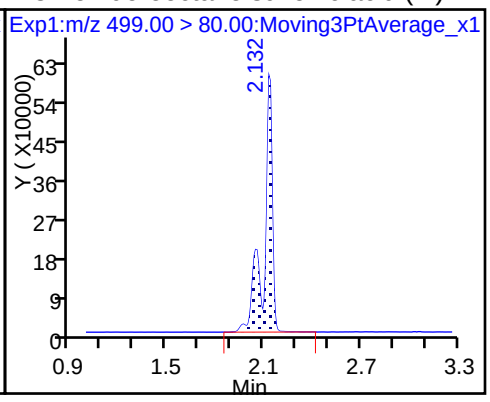
5 Perfluorooctanoic acid



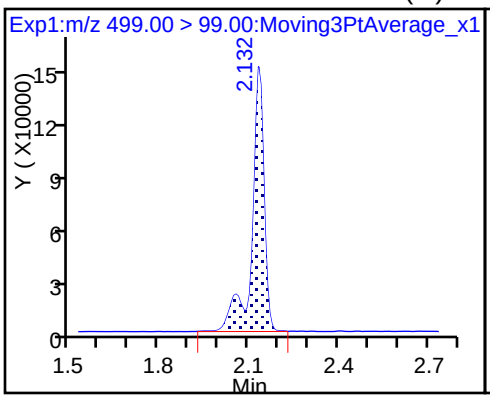
5 Perfluorooctanoic acid



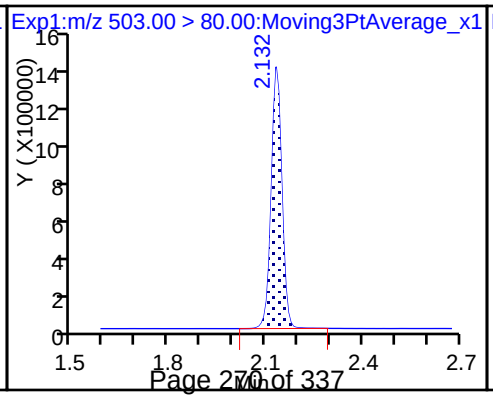
8 Perfluorooctane sulfonic acid (M)



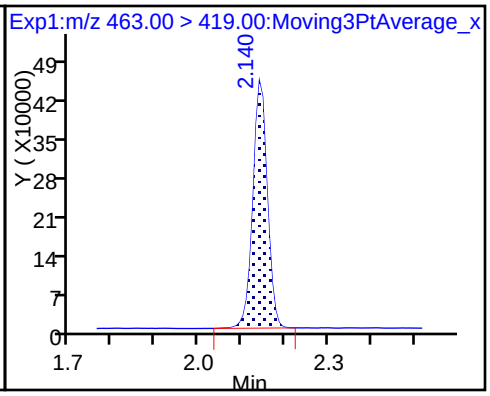
8 Perfluorooctane sulfonic acid (M)



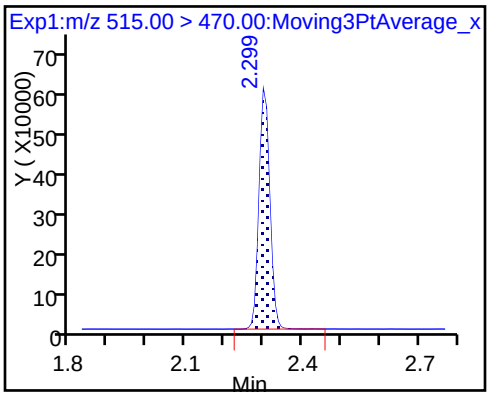
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.299
Y (X10000)
70
60
50
40
30
20
10
0
1.8
2.1
2.4
2.7
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

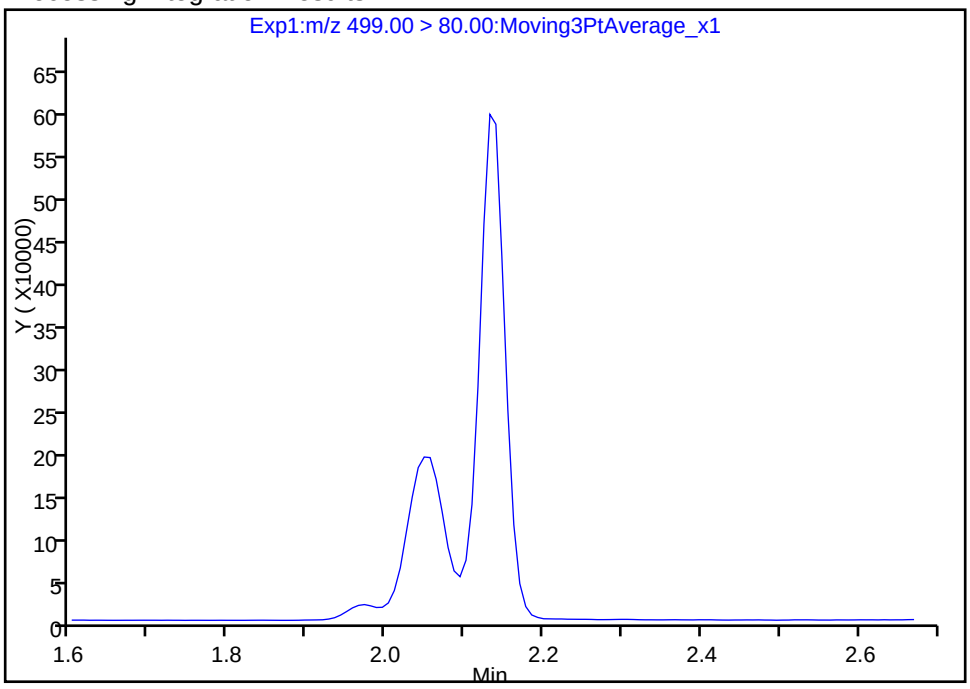
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_005.d
Injection Date: 13-Nov-2017 02:41:52 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

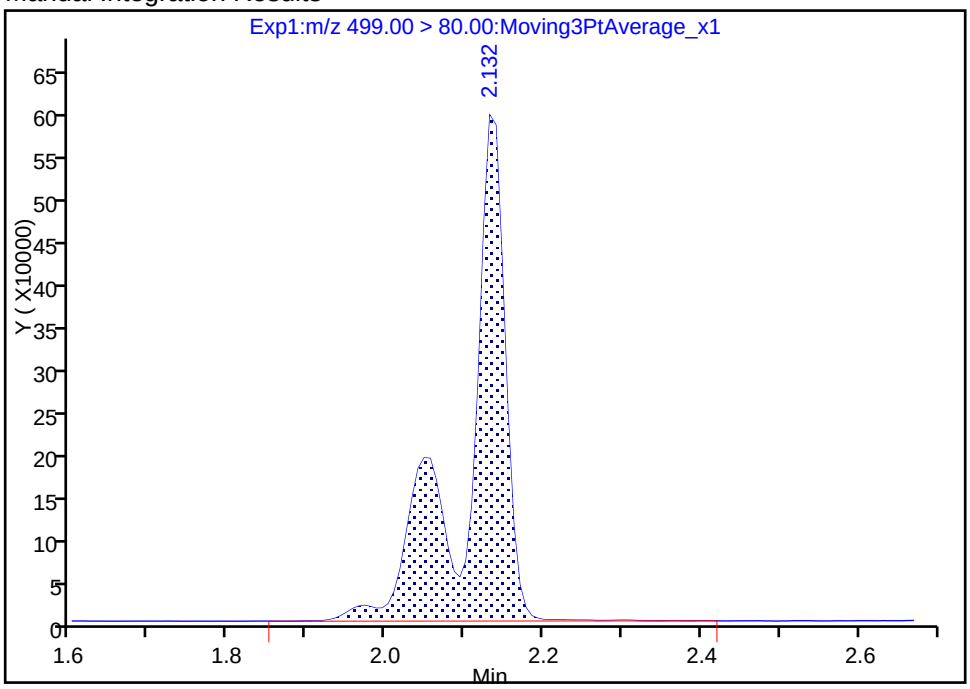
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.13
Area: 2067365
Amount: 20.495460
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:54:23
Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

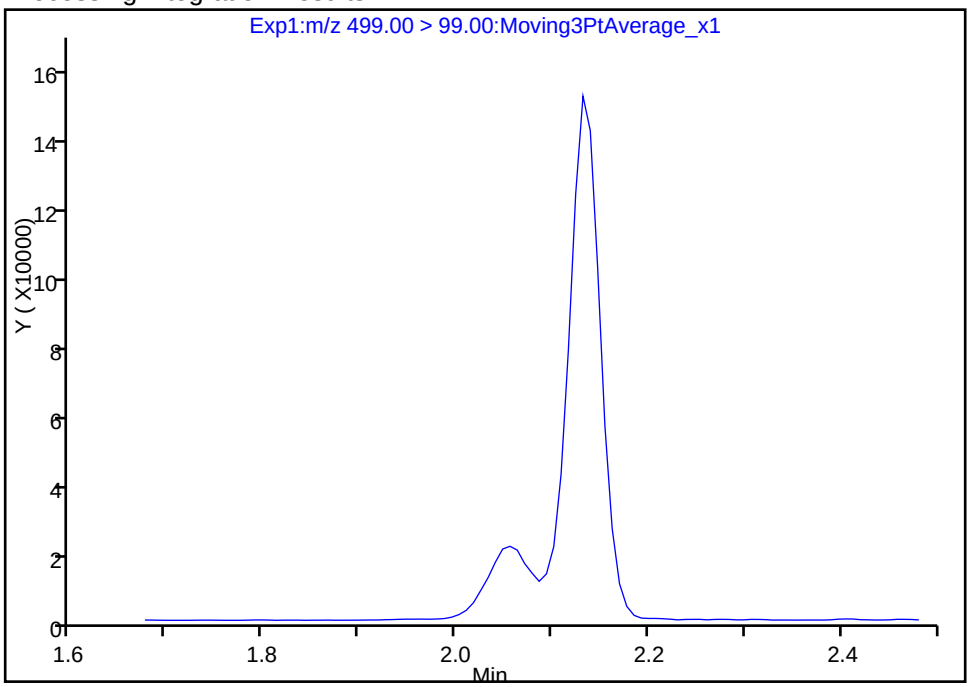
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_005.d
Injection Date: 13-Nov-2017 02:41:52 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

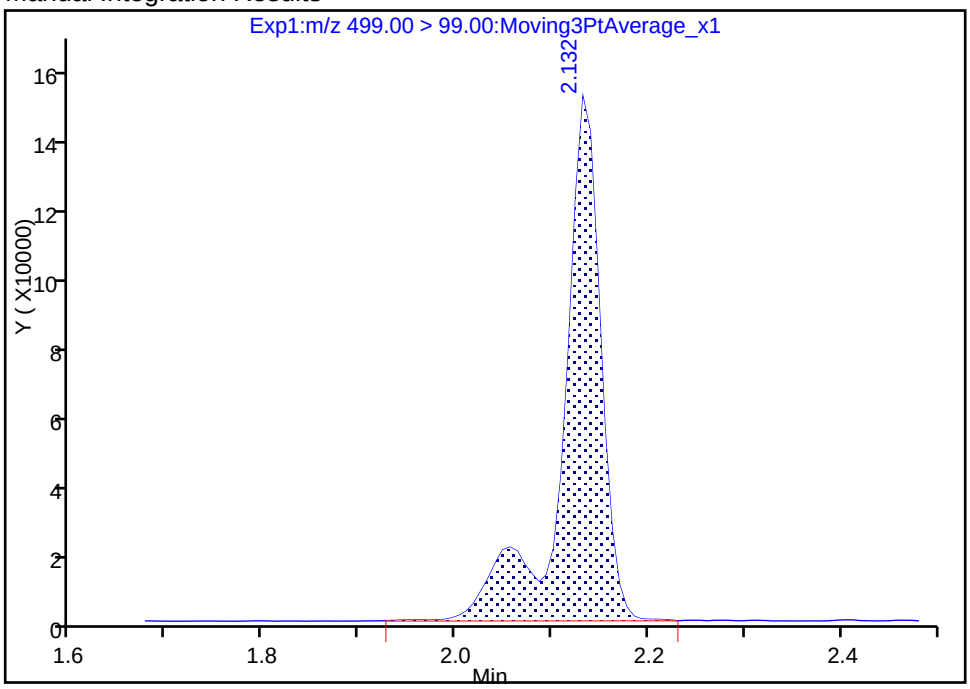
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.13
Area: 409140
Amount: 20.495460
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:55:04
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

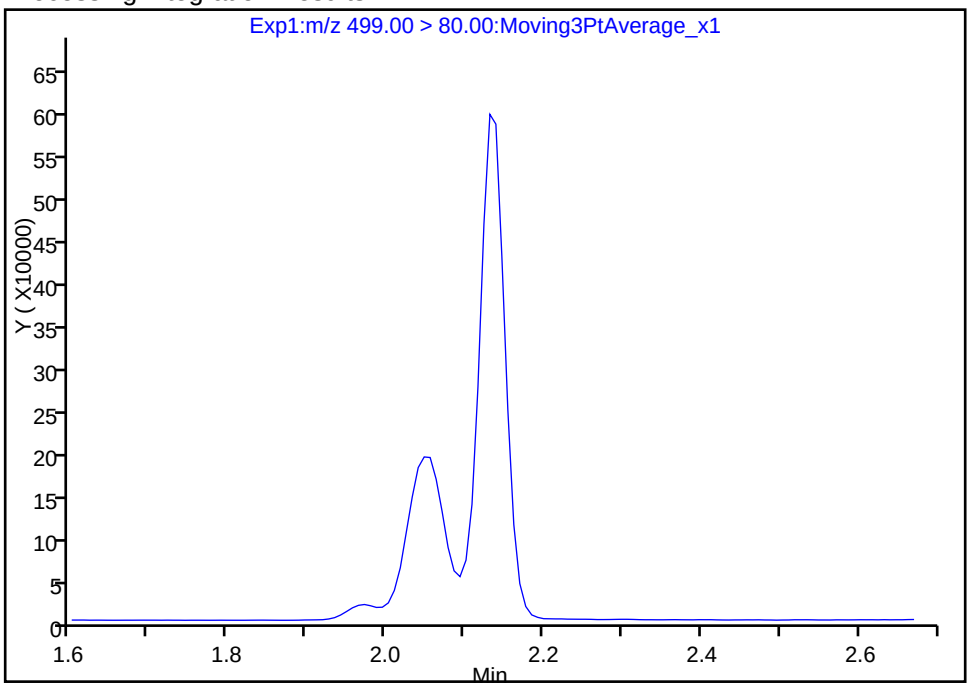
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_005.d
Injection Date: 13-Nov-2017 02:41:52 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

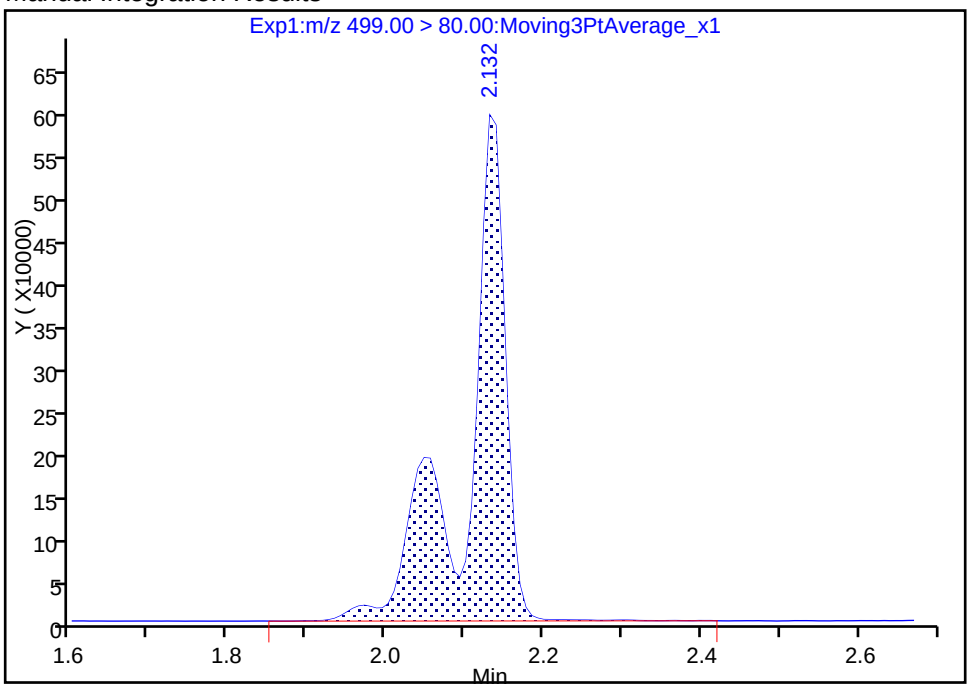
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.13
Area: 2067365
Amount: 20.495460
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:55:04
Audit Action: Manually Integrated Audit Reason: Isomers

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Lab Sample ID: CCV 320-194241/14 Calibration Date: 11/13/2017 03:38

Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/03/2017 14:01

Lab File ID: 2017.11.13_537A_017.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.9190		135	135	0.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9320		14.9	15.0	-0.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.682		45.2	45.0	0.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9706		31.5	30.0	4.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9543		61.0	60.0	1.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6855		31.0	30.0	3.2	30.0
13C2 PFHxA	Ave	1.100	1.089		9.90	10.0	-1.0	30.0
13C2 PFDA	Ave	0.7652	0.7607		9.94	10.0	-0.6	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Lab Sample ID: CCV 320-194251/14 Calibration Date: 11/13/2017 03:38

Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/03/2017 14:01

Lab File ID: 2017.11.13_537A_017.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.9190		135	135	0.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9320		14.9	15.0	-0.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.682		45.2	45.0	0.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9706		31.5	30.0	4.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9543		61.0	60.0	1.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6855		31.0	30.0	3.2	30.0
13C2 PFHxA	Ave	1.100	1.089		9.90	10.0	-1.0	30.0
13C2 PFDA	Ave	0.7652	0.7607		9.94	10.0	-0.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_017.d
Lims ID: CCV L5
Client ID:
Sample Type: CCVIS
Inject. Date: 13-Nov-2017 03:38:02 ALS Bottle#: 5 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 17:02:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.444	-0.018	1.000	13825669	135.4		5956	
298.90 > 99.00	1.426	1.444	-0.018	1.000	10392378		1.33(0.00-0.00)	16075	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1656017	9.90		6690	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.725	-0.026	1.000	8436762	45.2		7555	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.725	-0.026	1.000	2126172	14.9		684	
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.913	-0.024		1520572	10.0		5575	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.889	1.914	-0.025	1.000	4431349	31.5		844	
413.00 > 169.00	1.889	1.914	-0.025	1.000	2253709		1.97(0.00-0.00)	2468	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.124	2.117	0.007	1.000	6381441	61.0		4229	M
499.00 > 99.00	2.124	2.117	0.007	1.000	1286454		4.96(0.00-0.00)	2536	M
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.151	-0.027		3195765	28.7		4281	
9 Perfluorononanoic acid									
463.00 > 419.00	2.132	2.158	-0.026	1.000	3127450	31.0		1020	
$ 10 13C2 PFDA									
515.00 > 470.00	2.299	2.312	-0.013	1.000	1156753	9.94		6335	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L5_00024 Amount Added: 1.00 Units: mL

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_017.d
Lims ID: CCV L5
Client ID:
Sample Type: CCVIS
Inject. Date: 13-Nov-2017 03:38:02 ALS Bottle#: 5 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 17:02:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.444	-0.018	1.000	13825669	135.4		5956	
298.90 > 99.00	1.426	1.444	-0.018	1.000	10392378		1.33(0.00-0.00)	16075	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1656017	9.90		6690	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.725	-0.026	1.000	8436762	45.2		7555	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.725	-0.026	1.000	2126172	14.9		684	
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.913	-0.024		1520572	10.0		5575	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.889	1.914	-0.025	1.000	4431349	31.5		844	
413.00 > 169.00	1.889	1.914	-0.025	1.000	2253709		1.97(0.00-0.00)	2468	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.124	2.117	0.007	1.000	6381441	61.0		4229	M
499.00 > 99.00	2.124	2.117	0.007	1.000	1286454		4.96(0.00-0.00)	2536	M
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.151	-0.027		3195765	28.7		4281	
9 Perfluorononanoic acid									
463.00 > 419.00	2.132	2.158	-0.026	1.000	3127450	31.0		1020	
$ 10 13C2 PFDA									
515.00 > 470.00	2.299	2.312	-0.013	1.000	1156753	9.94		6335	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L5_00024 Amount Added: 1.00 Units: mL

Report Date: 14-Nov-2017 17:12:07 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_017.d

Injection Date: 13-Nov-2017 03:38:02 Instrument ID: A8_N

Lims ID: CCV L5

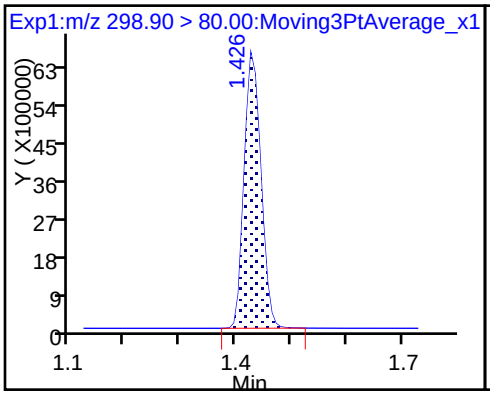
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 14

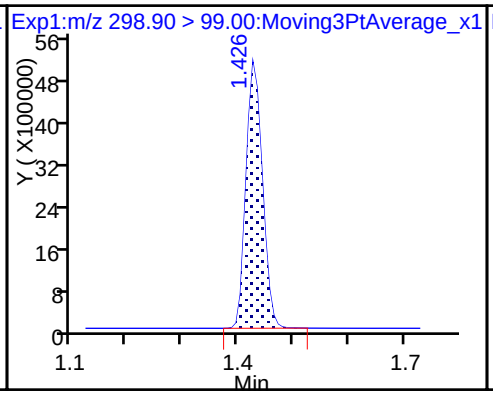
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

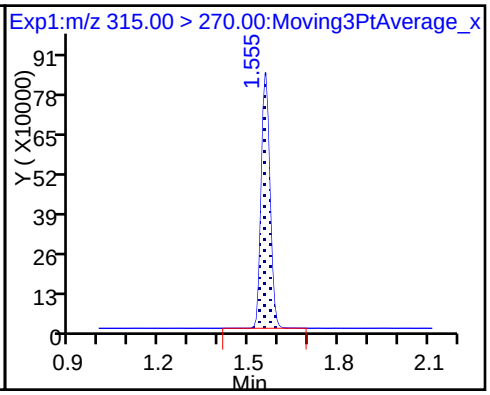
1 Perfluorobutanesulfonic acid



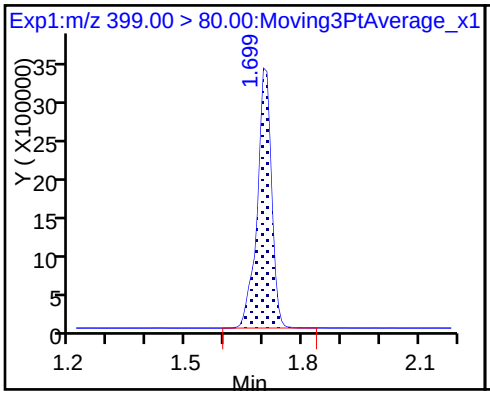
1 Perfluorobutanesulfonic acid



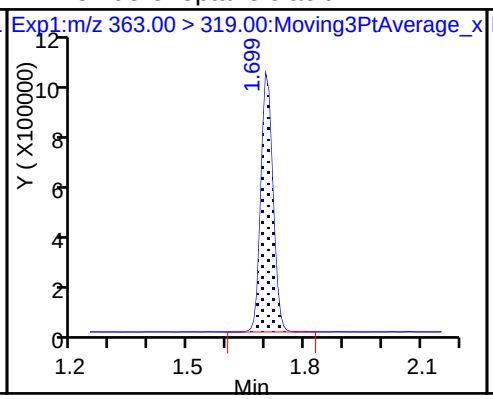
$ 2 13C2 PFHxA



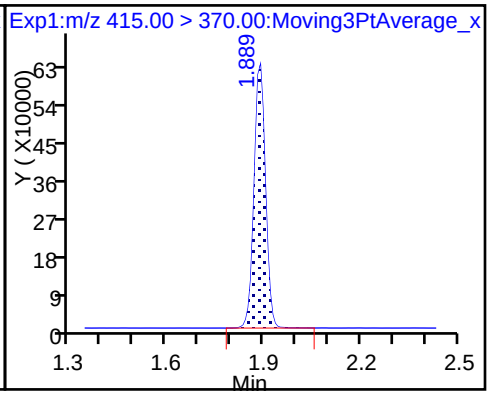
3 Perfluorohexanesulfonic acid



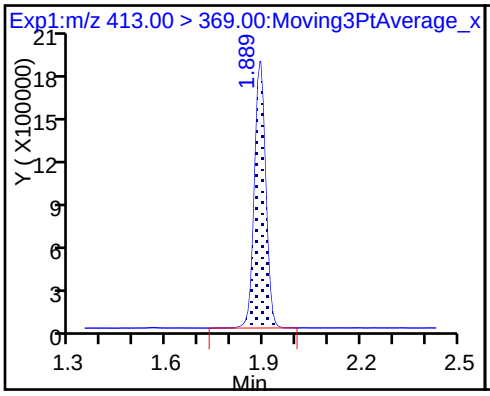
4 Perfluoroheptanoic acid



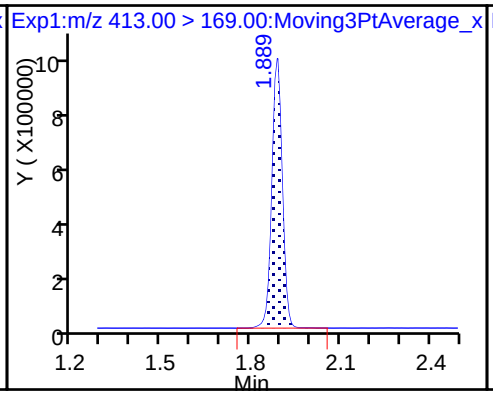
* 6 13C2-PFOA



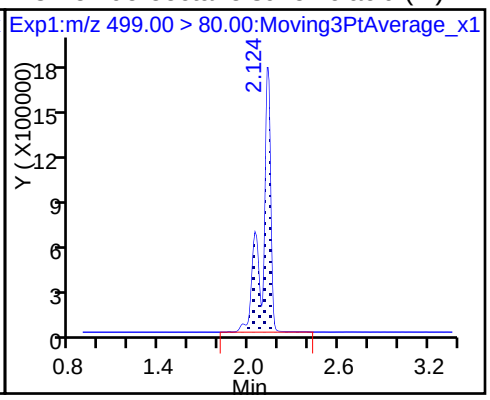
5 Perfluorooctanoic acid



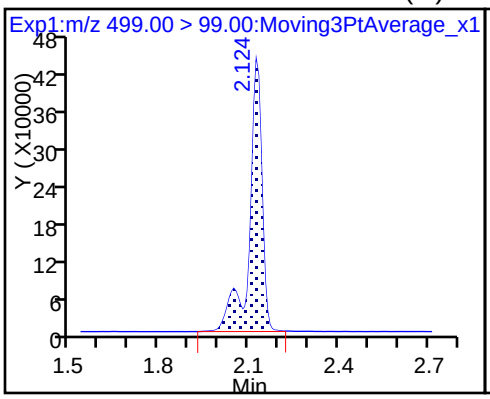
5 Perfluorooctanoic acid



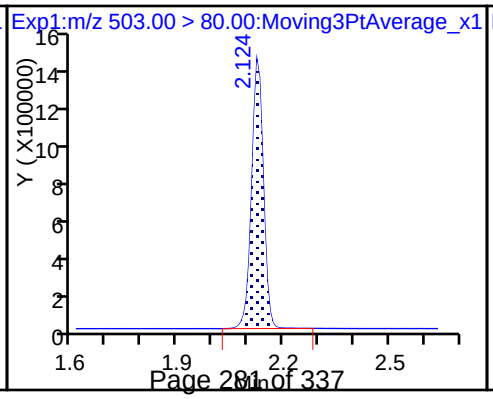
8 Perfluorooctane sulfonic acid (M)



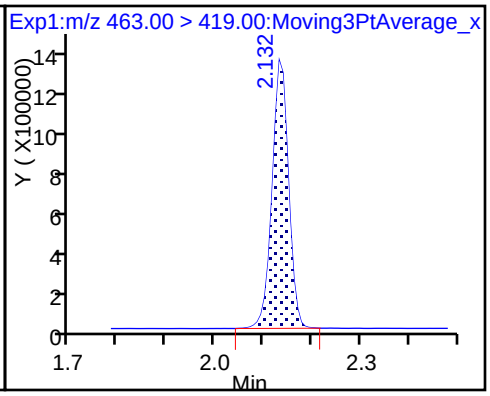
8 Perfluorooctane sulfonic acid (M)



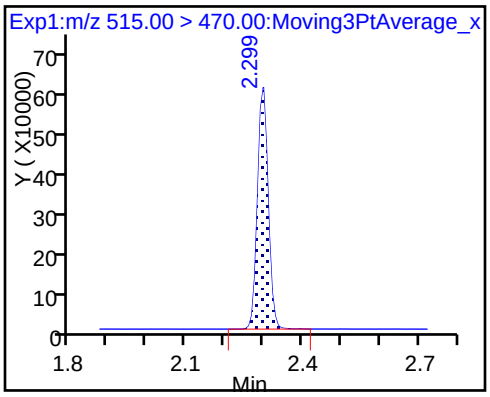
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.299
Y (X10000)
70
60
50
40
30
20
10
0
1.8
2.1
2.4
2.7
Min

Report Date: 14-Nov-2017 17:12:07 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_017.d

Injection Date: 13-Nov-2017 03:38:02 Instrument ID: A8_N

Lims ID: CCV L5

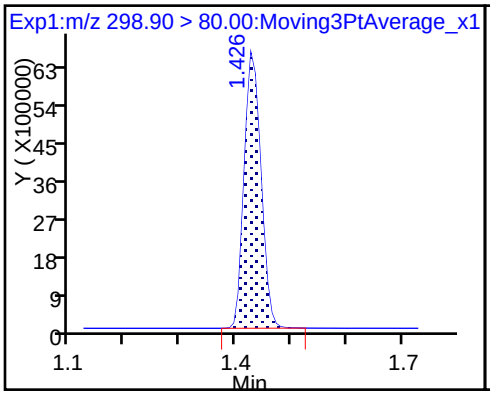
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 14

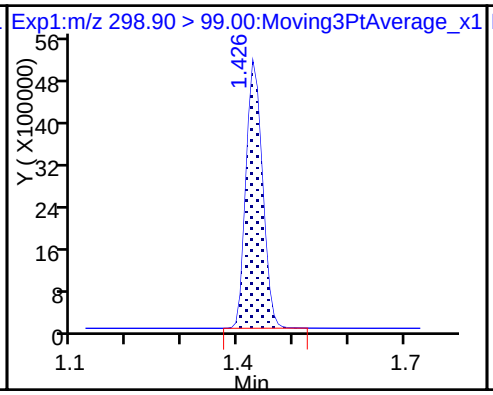
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

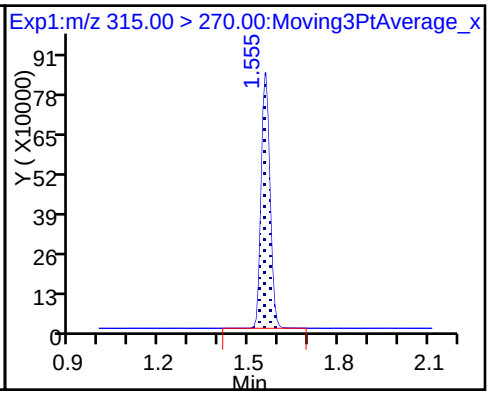
1 Perfluorobutanesulfonic acid



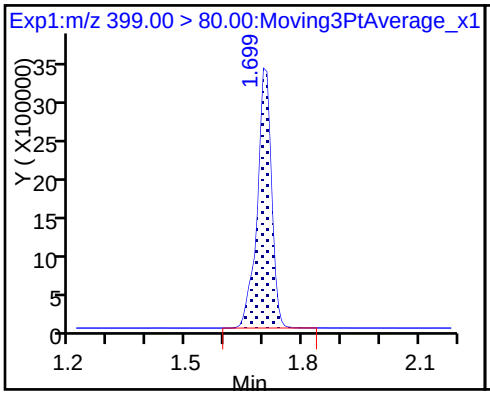
1 Perfluorobutanesulfonic acid



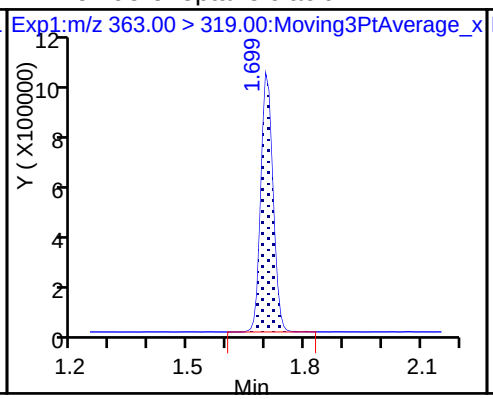
$ 2 13C2 PFHxA



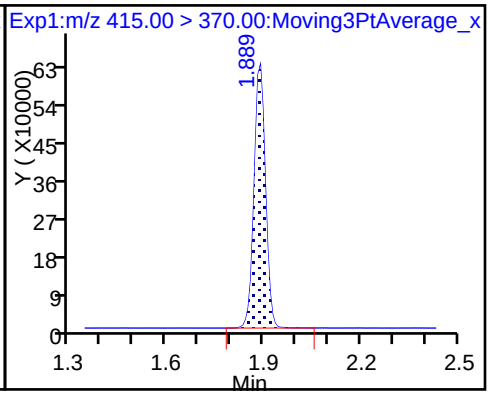
3 Perfluorohexanesulfonic acid



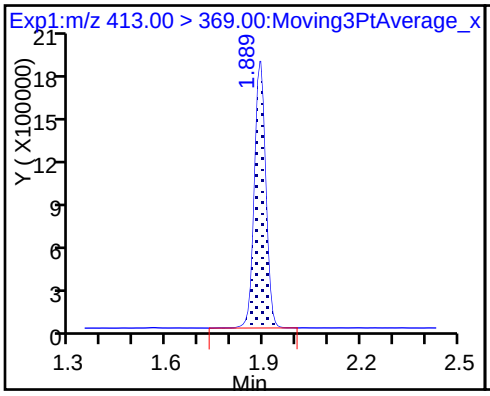
4 Perfluoroheptanoic acid



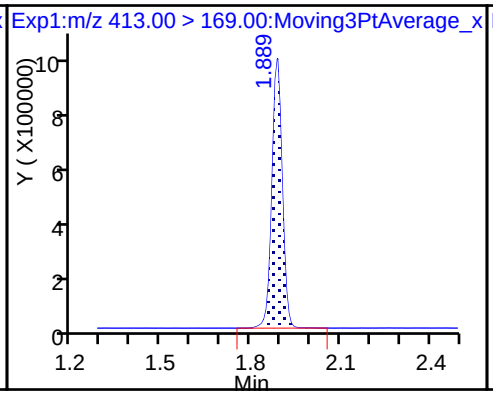
* 6 13C2-PFOA



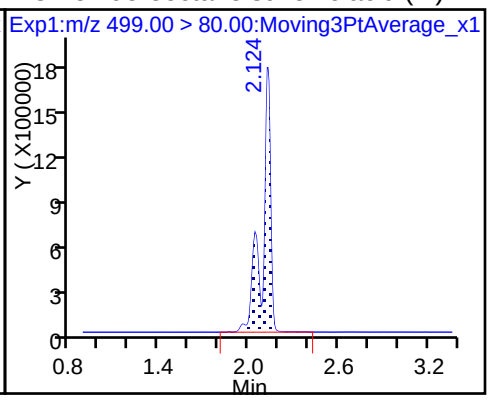
5 Perfluorooctanoic acid



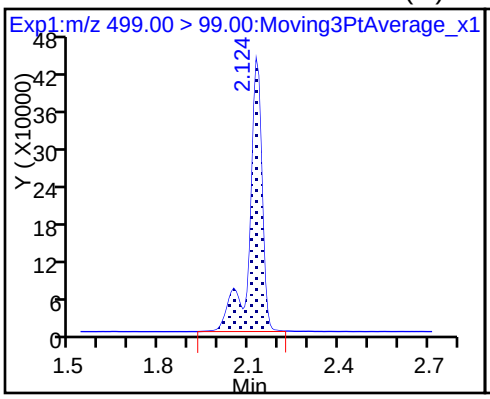
5 Perfluorooctanoic acid



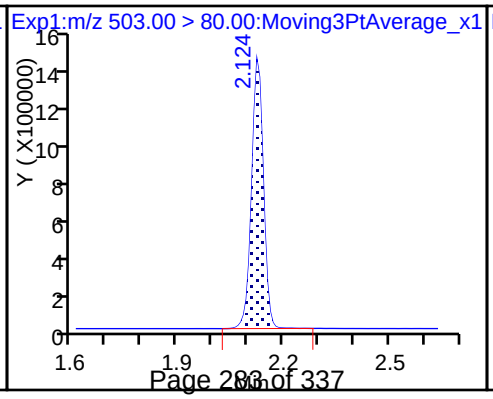
8 Perfluorooctane sulfonic acid (M)



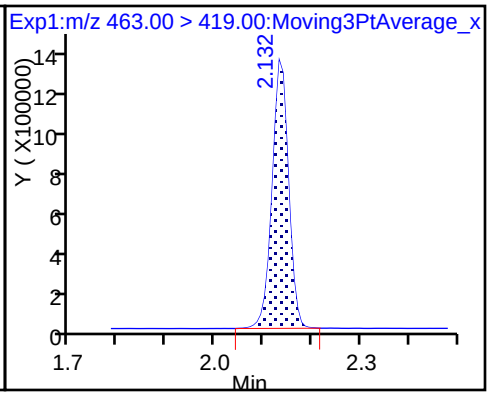
8 Perfluorooctane sulfonic acid (M)



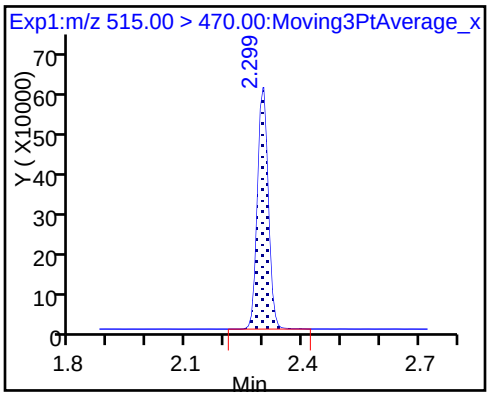
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.299
Y (X10000)
70
60
50
40
30
20
10
0
1.8
2.1
2.4
2.7
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

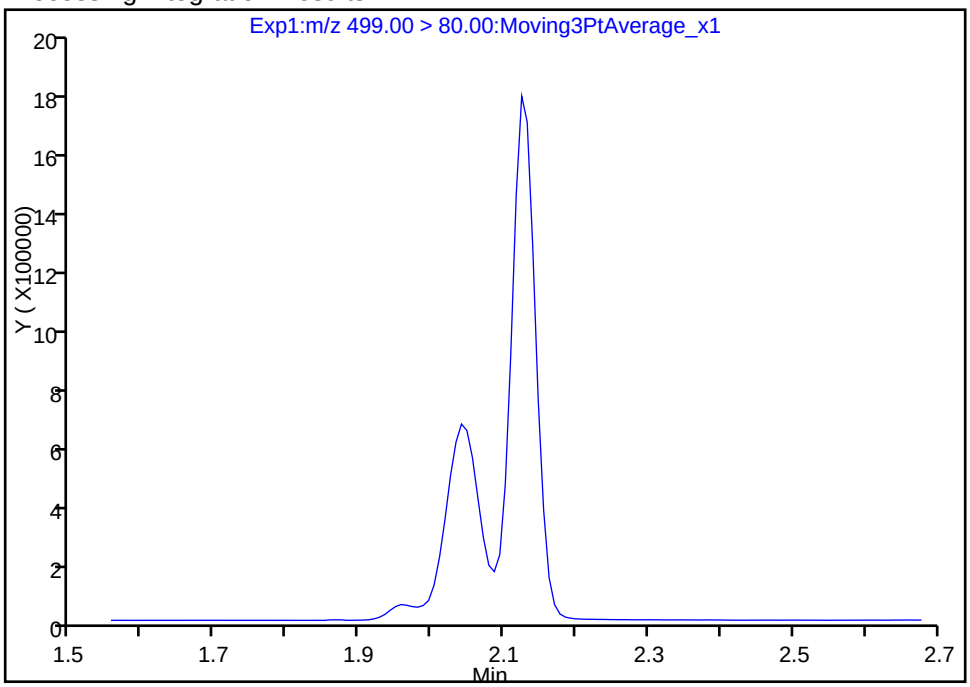
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_017.d
Injection Date: 13-Nov-2017 03:38:02 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

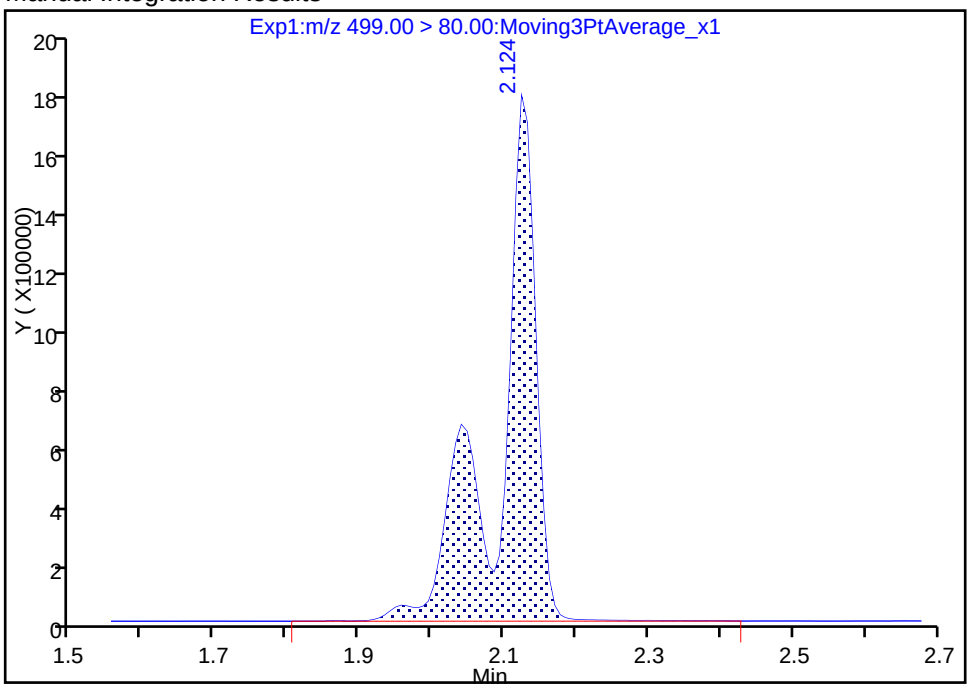
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 6381441
Amount: 60.993170
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:01:48
Audit Action: Assigned Compound ID Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

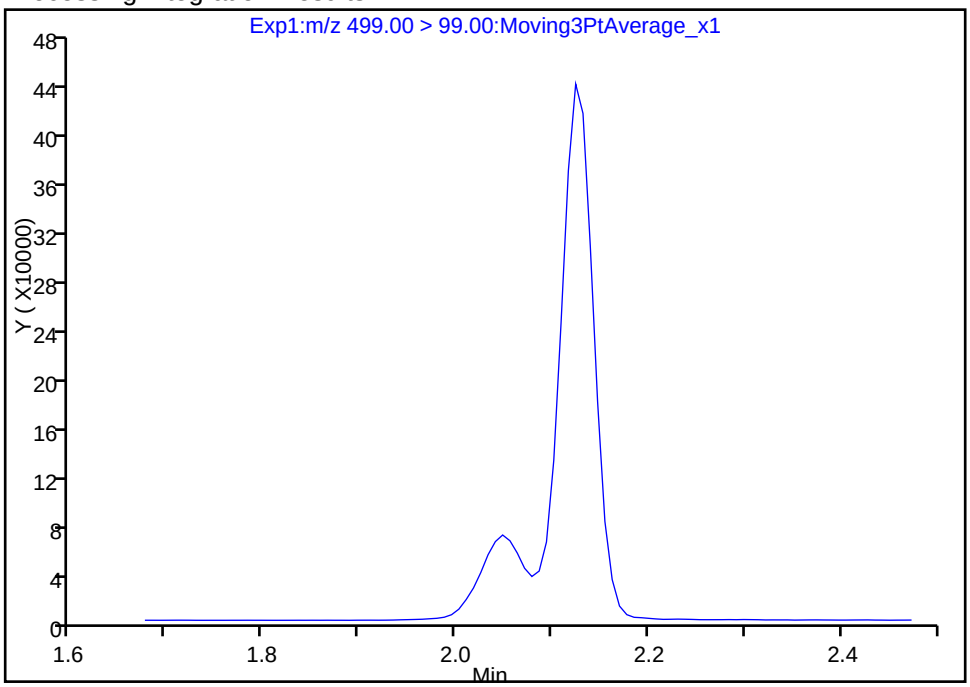
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_017.d
Injection Date: 13-Nov-2017 03:38:02 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

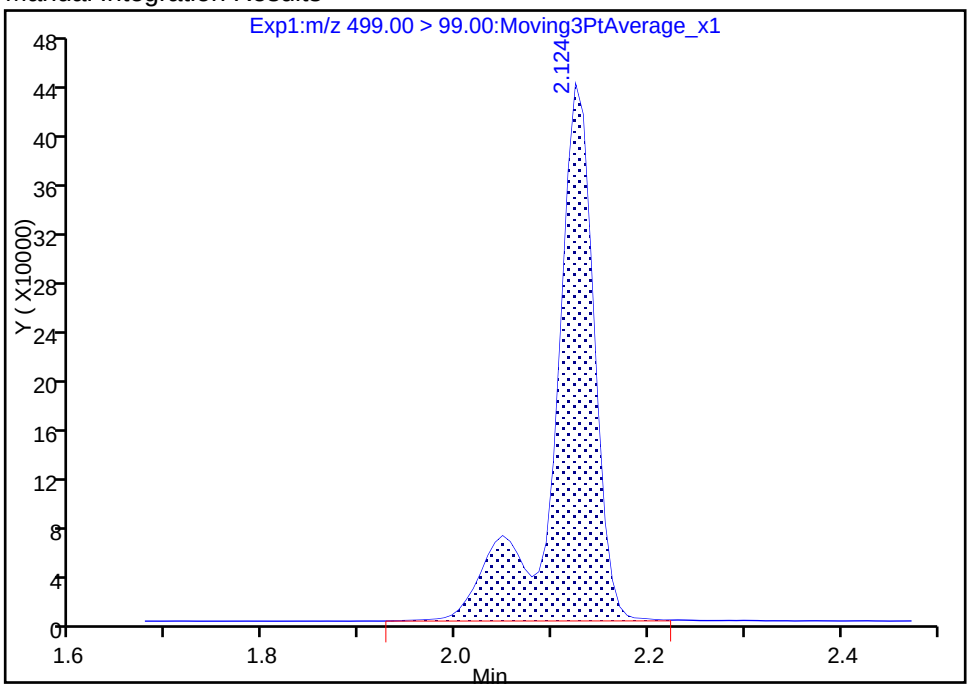
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 1286454
Amount: 60.993170
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:02:01
Audit Action: Manually Integrated Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

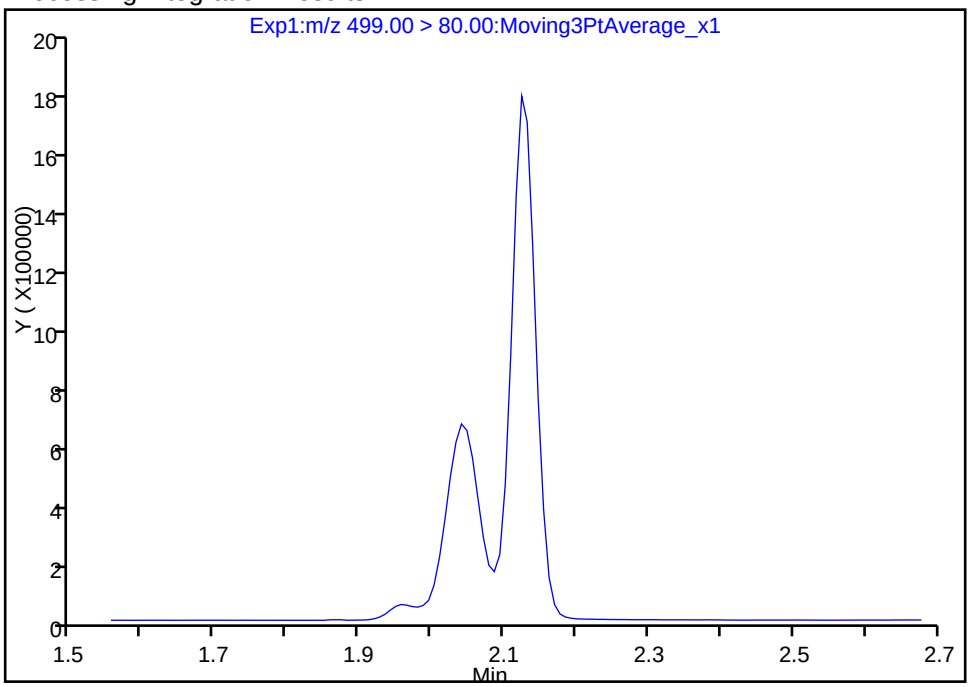
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_017.d
Injection Date: 13-Nov-2017 03:38:02 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

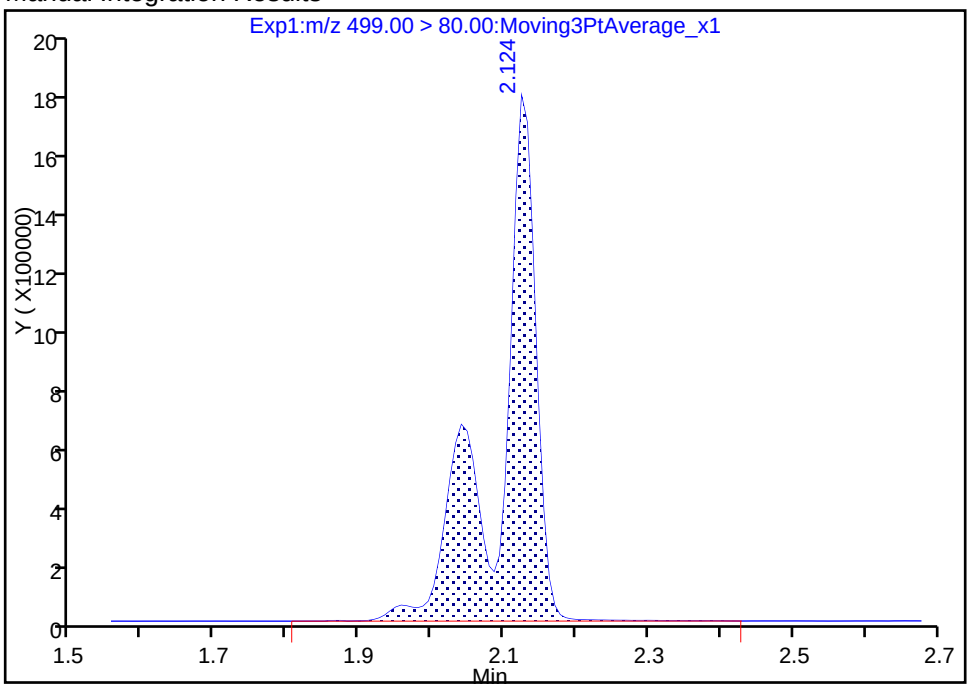
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 6381441
Amount: 60.993170
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:02:01
Audit Action: Manually Integrated Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

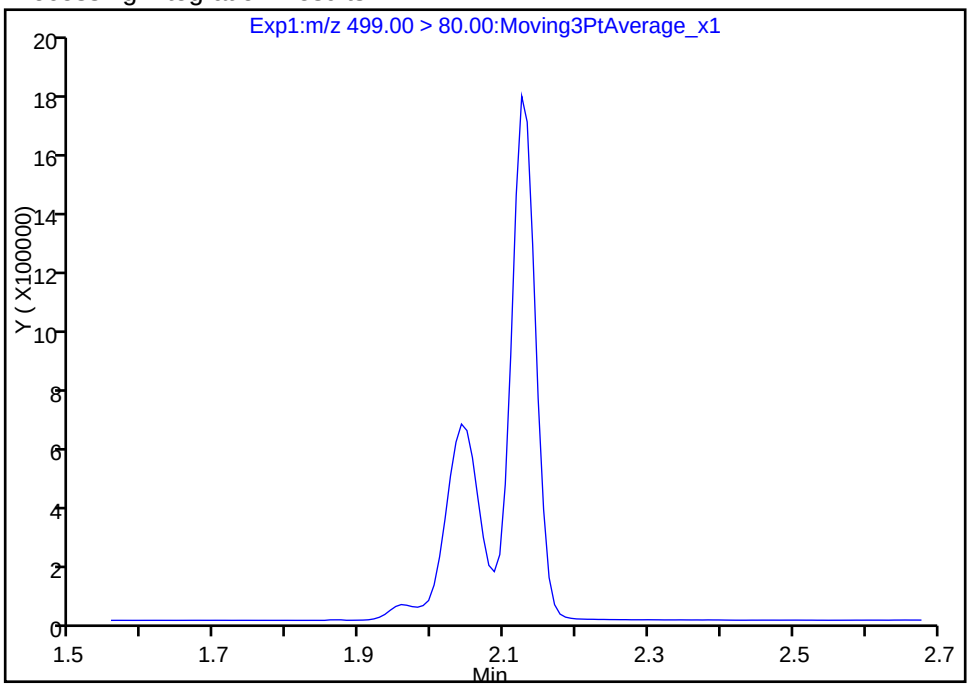
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_017.d
Injection Date: 13-Nov-2017 03:38:02 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

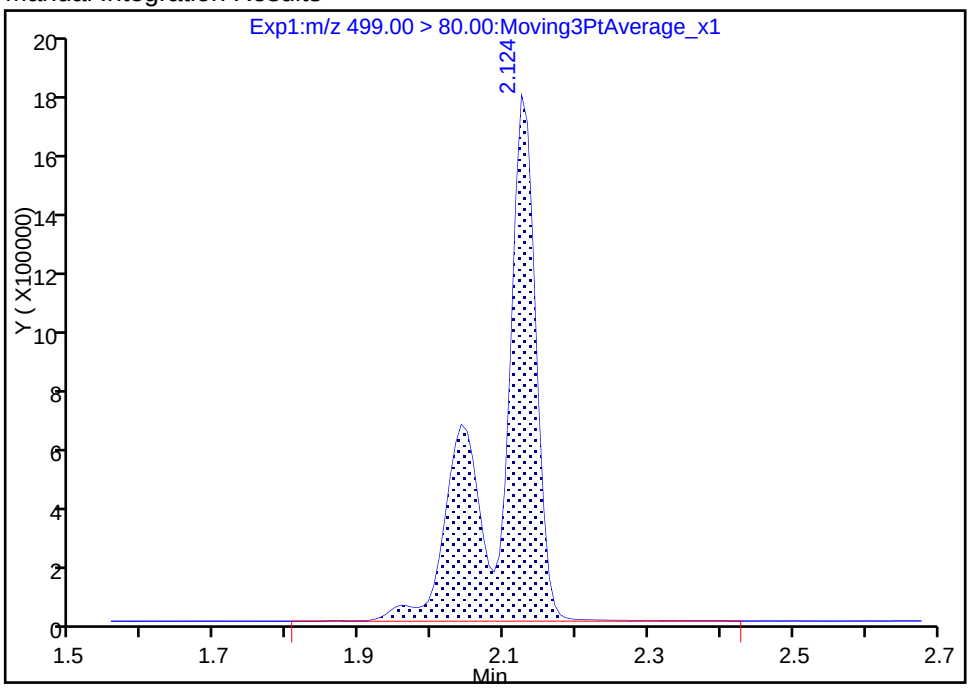
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 6381441
Amount: 60.993170
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:01:48
Audit Action: Assigned Compound ID Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

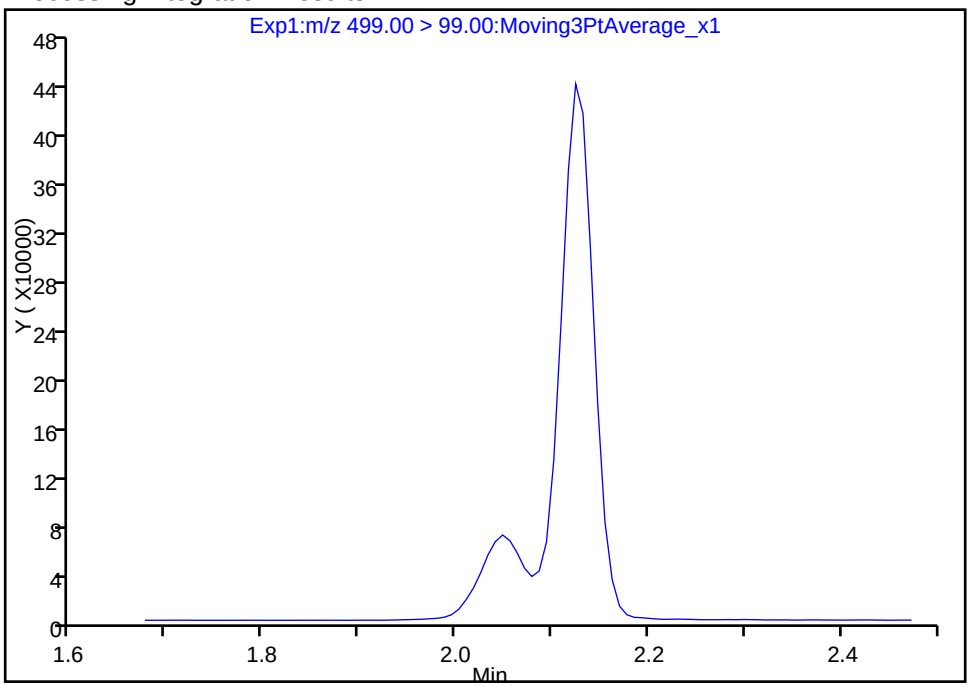
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_017.d
Injection Date: 13-Nov-2017 03:38:02 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

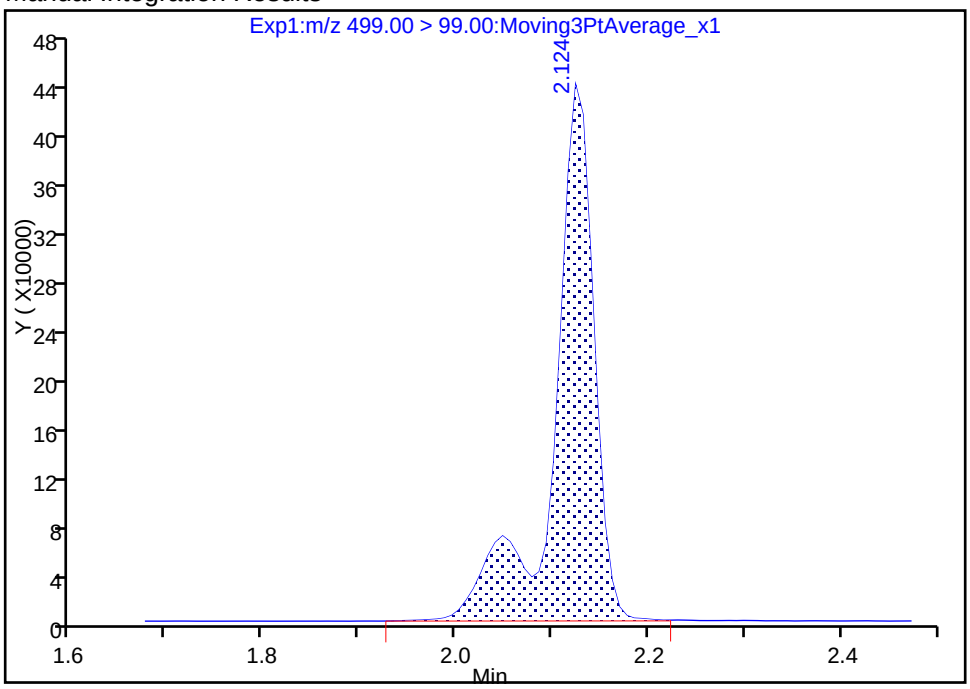
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 1286454
Amount: 60.993170
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:02:01
Audit Action: Manually Integrated Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

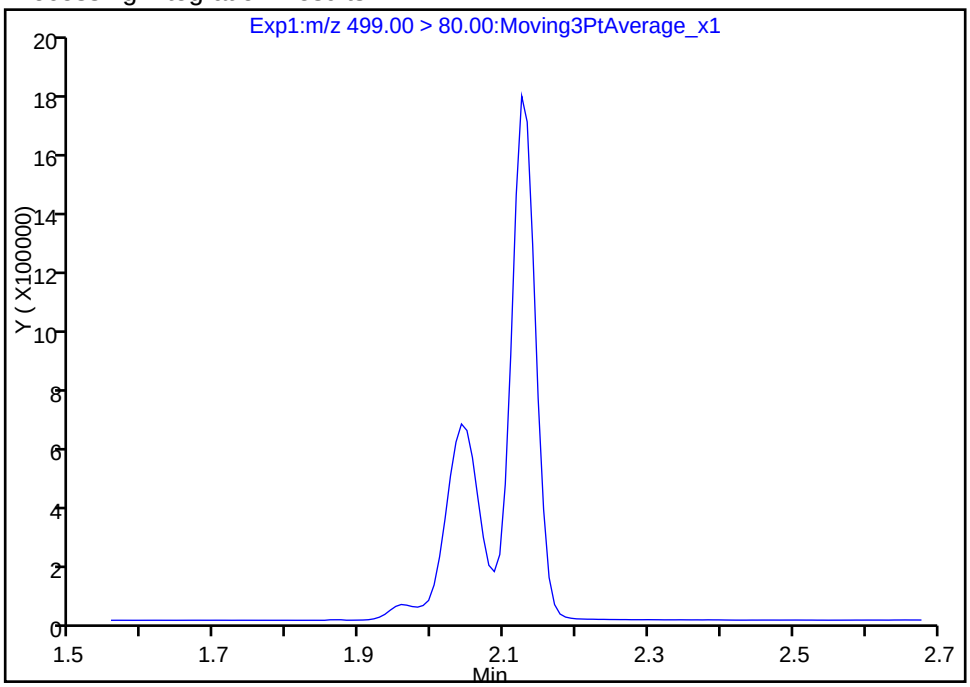
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_017.d
Injection Date: 13-Nov-2017 03:38:02 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

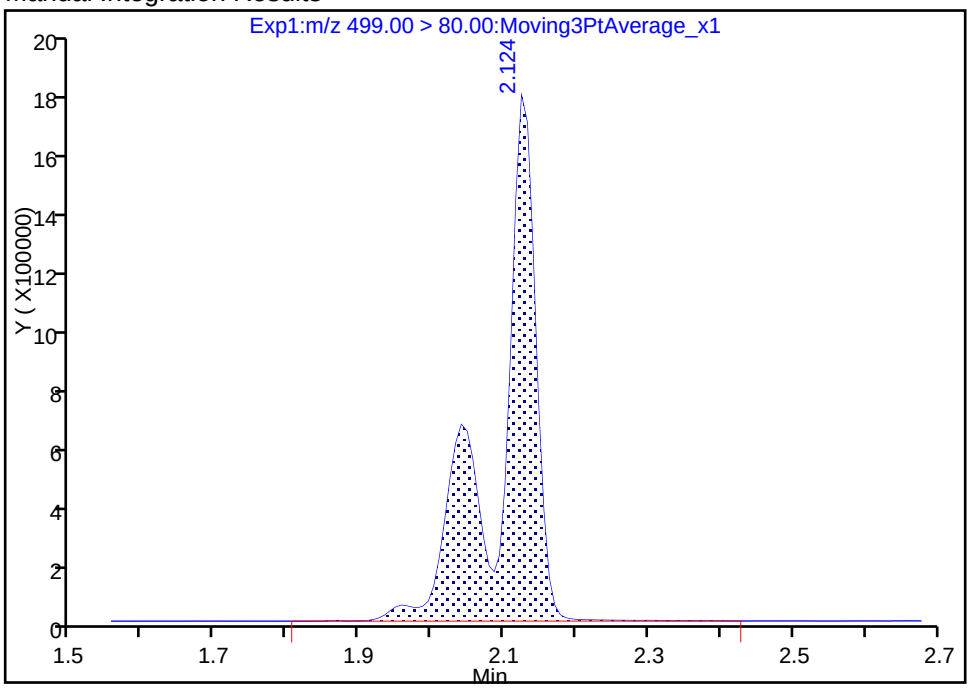
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 6381441
Amount: 60.993170
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:02:01
Audit Action: Manually Integrated Audit Reason: Missed Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Lab Sample ID: CCV 320-194251/25 Calibration Date: 11/13/2017 04:29

Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/03/2017 14:01

Lab File ID: 2017.11.13_537A_028.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.109		47.6	45.0	5.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.8978		4.79	5.00	-4.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.698		15.2	15.0	1.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9001		9.73	10.0	-2.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9068		19.3	20.0	-3.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6547		9.86	10.0	-1.4	30.0
13C2 PFHxA	Ave	1.100	1.061		9.65	10.0	-3.5	30.0
13C2 PFDA	Ave	0.7652	0.7009		9.16	10.0	-8.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_028.d
Lims ID: CCV L3
Client ID:
Sample Type: CCVIS
Inject. Date: 13-Nov-2017 04:29:32 ALS Bottle#: 3 Worklist Smp#: 25
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L3
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:12:15 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 17:05:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.444	-0.018	1.000	5523142	47.6		2784	
298.90 > 99.00	1.426	1.444	-0.018	1.000	3803850		1.45(0.00-0.00)	9282	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1641416	9.65		7335	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.725	-0.026	1.000	2820355	15.2		3429	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.725	-0.026	1.000	694490	4.79		216	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.913	-0.031		1546685	10.0		5717	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.882	1.914	-0.032	1.000	1393279	9.73		265	
413.00 > 169.00	1.882	1.914	-0.032	1.000	746886		1.87(0.00-0.00)	943	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.117	2.117	0.0	1.000	2008370	19.3		1605	
499.00 > 99.00	2.117	2.117	0.0	1.000	423799		4.74(0.00-0.00)	1021	
* 7 13C4 PFOS									
503.00 > 80.00	2.117	2.151	-0.034		3175276	28.7		4588	
9 Perfluorononanoic acid									
463.00 > 419.00	2.124	2.158	-0.034	1.000	1012826	9.86		310	
$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.312	-0.021	1.000	1084053	9.16		6672	

Reagents:

LC537-L3_00023 Amount Added: 1.00 Units: mL

Report Date: 14-Nov-2017 17:12:15 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_028.d

Injection Date: 13-Nov-2017 04:29:32 Instrument ID: A8_N

Lims ID: CCV L3

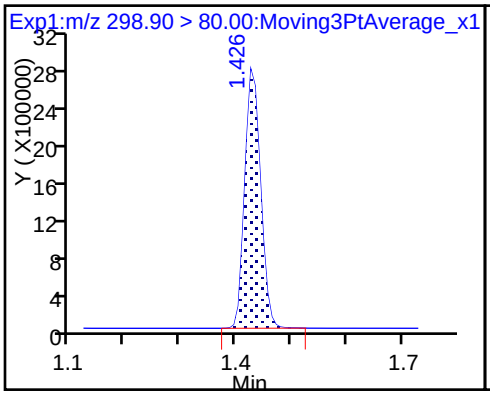
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 25

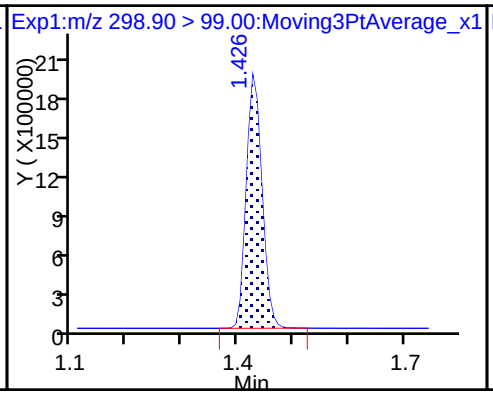
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

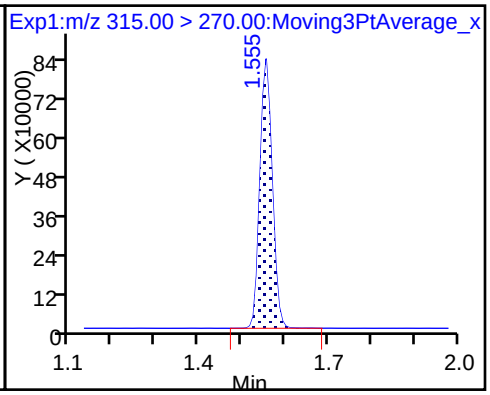
1 Perfluorobutanesulfonic acid



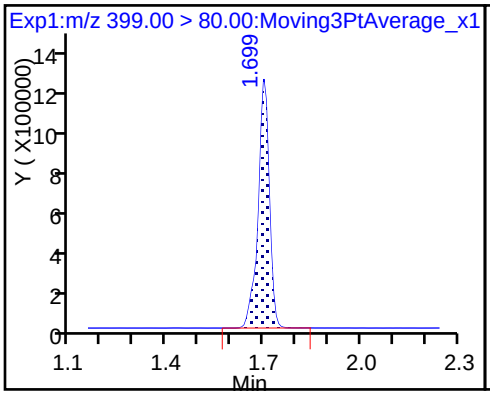
1 Perfluorobutanesulfonic acid



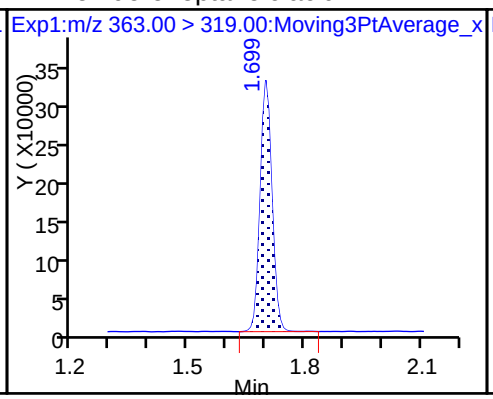
$ 2 13C2 PFHxA



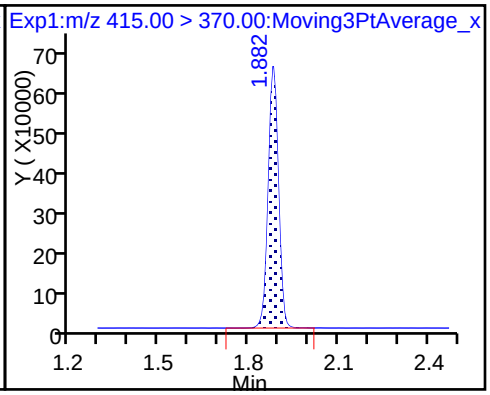
3 Perfluorohexanesulfonic acid



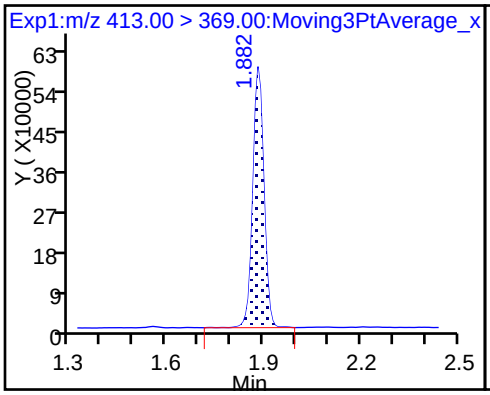
4 Perfluoroheptanoic acid



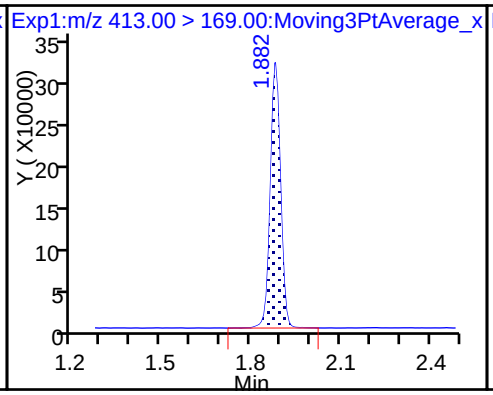
* 6 13C2-PFOA



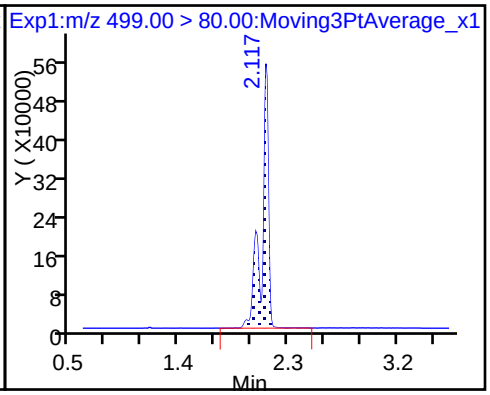
5 Perfluorooctanoic acid



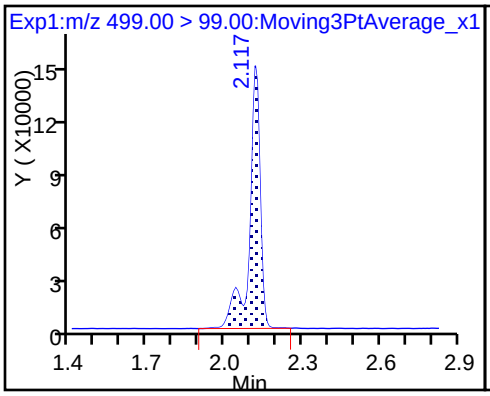
5 Perfluorooctanoic acid



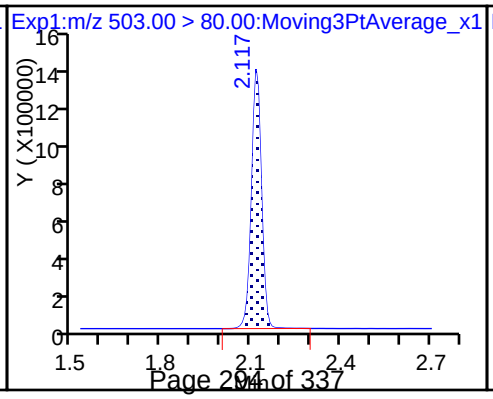
8 Perfluorooctane sulfonic acid



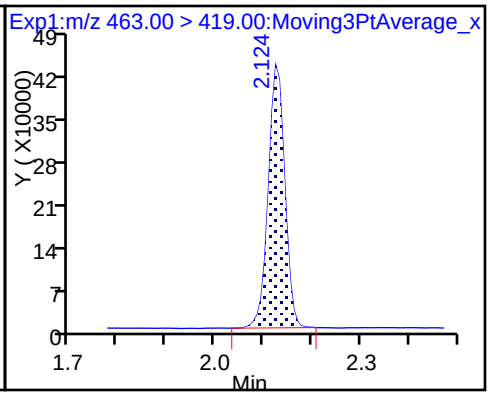
8 Perfluorooctane sulfonic acid



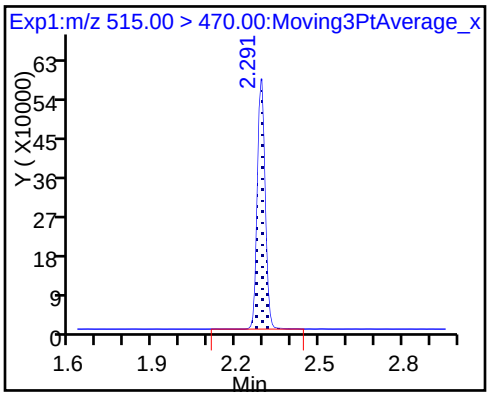
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.291
Y (X10000)
63
54
45
36
27
18
9
0
1.6
1.9
2.2
2.5
2.8
Min

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-193512/1-A

Matrix: Water | Lab File ID: 2017.11.13_537A_007.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 250.00(mL) | Date Analyzed: 11/13/2017 02:51

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	85		70-130
STL00996	13C2 PFDA	91		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_007.d
Lims ID: MB 320-193512/1-A
Client ID:
Sample Type: MB
Inject. Date: 13-Nov-2017 02:51:14 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-193512/1-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.563	1.573	-0.010	1.000	1499346	8.55		6181	
* 6 13C2-PFOA									
415.00 > 370.00	1.897	1.913	-0.016		1594024	10.0		5883	
* 7 13C4 PFOS									
503.00 > 80.00	2.132	2.151	-0.019		3183489	28.7		4277	
$ 10 13C2 PFDA									
515.00 > 470.00	2.299	2.312	-0.013	1.000	1111328	9.11		7083	

Report Date: 14-Nov-2017 17:11:59 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_007.d

Injection Date: 13-Nov-2017 02:51:14 Instrument ID: A8_N

Lims ID: MB 320-193512/1-A

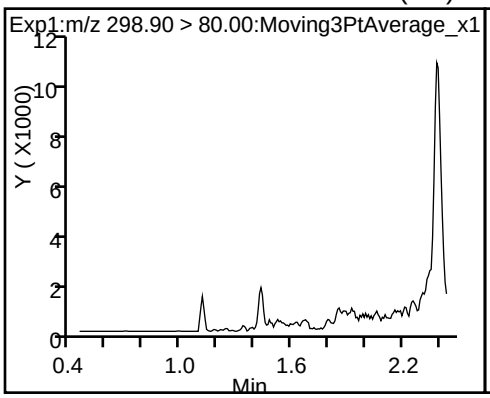
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4

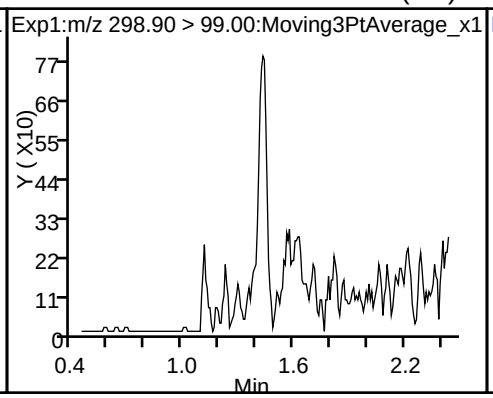
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

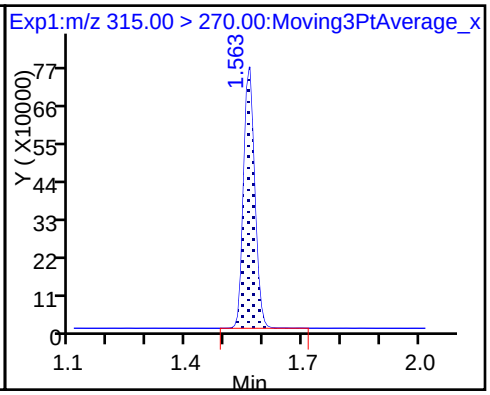
1 Perfluorobutanesulfonic acid (ND)



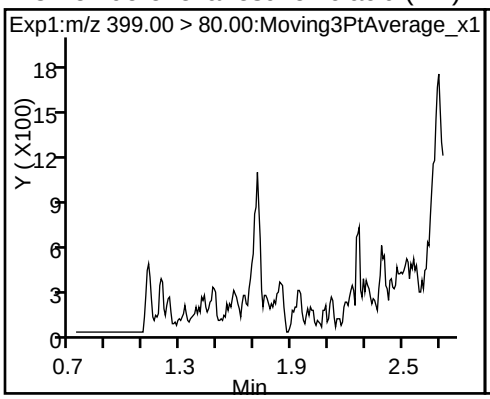
1 Perfluorobutanesulfonic acid (ND)



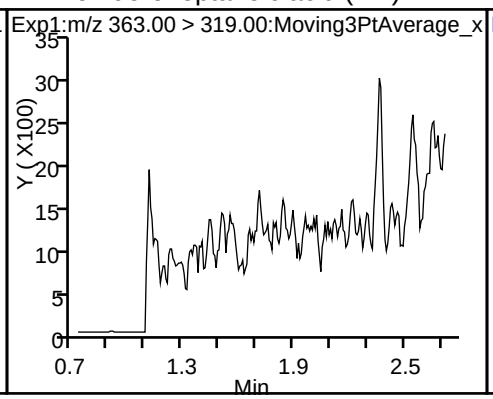
$ 2 13C2 PFHxA



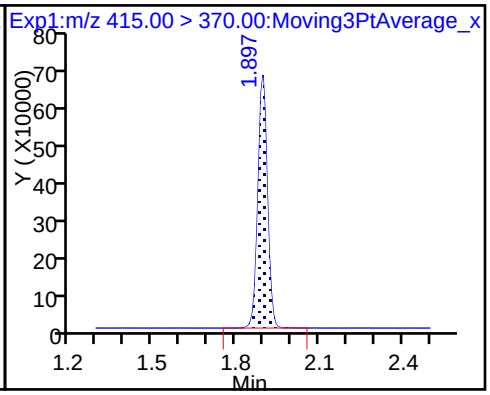
3 Perfluorohexanesulfonic acid (ND)



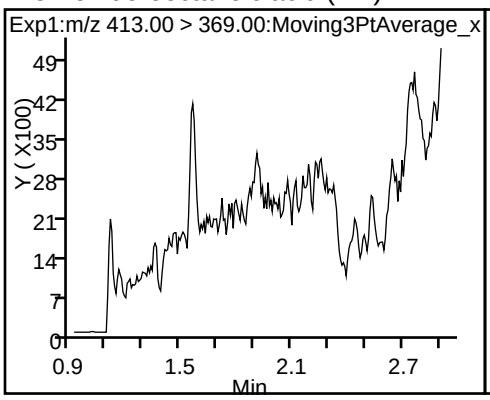
4 Perfluoroheptanoic acid (ND)



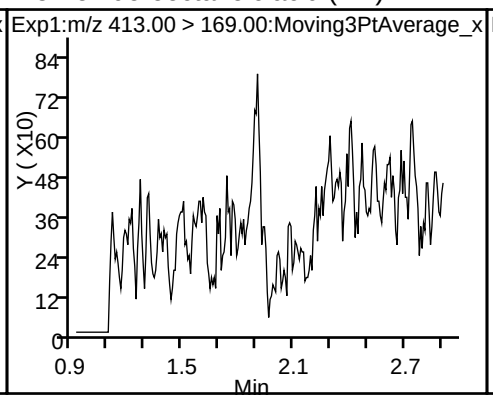
* 6 13C2-PFOA



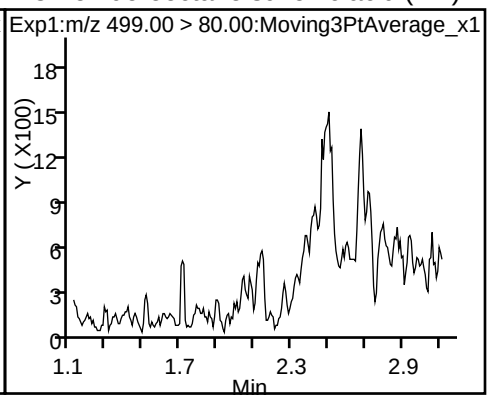
5 Perfluorooctanoic acid (ND)



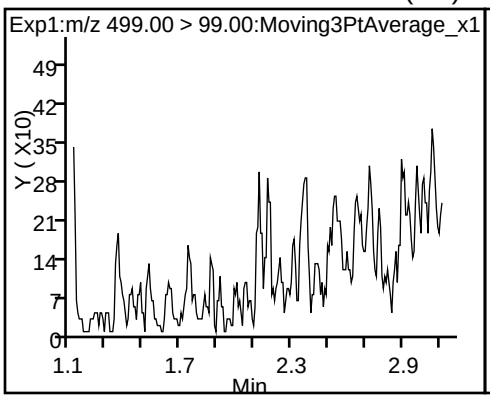
5 Perfluorooctanoic acid (ND)



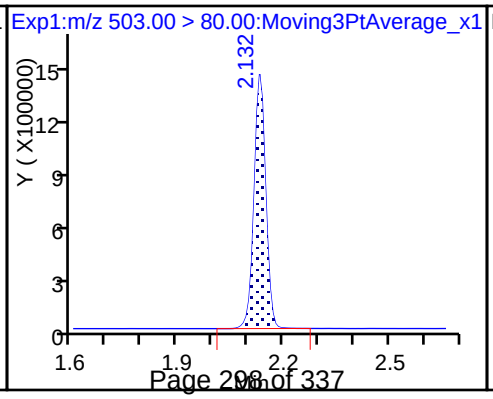
8 Perfluorooctane sulfonic acid (ND)



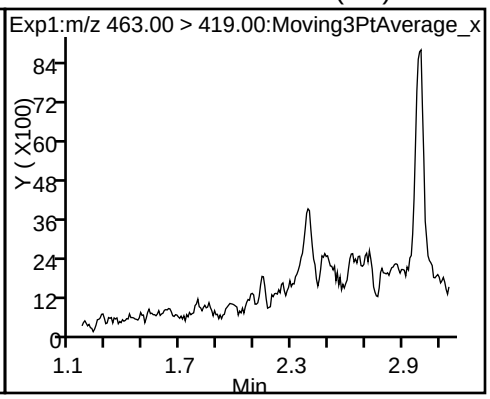
8 Perfluorooctane sulfonic acid (ND)



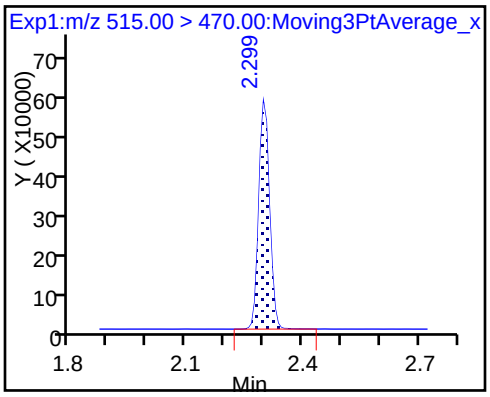
* 7 13C4 PFOS



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.299
Y (X10000)
70
60
50
40
30
20
10
0
1.8
2.1
2.4
2.7
Min

TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_007.d
Lims ID: MB 320-193512/1-A
Client ID:
Sample Type: MB
Inject. Date: 13-Nov-2017 02:51:14 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-193512/1-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.55	85.49
$ 10 13C2 PFDA	10.0	9.11	91.11

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-193512/2-A

Matrix: Water | Lab File ID: 2017.11.13_537A_008.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 250.00(mL) | Date Analyzed: 11/13/2017 02:55

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	210	M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	105		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	103		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	165		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	51.7		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	473		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	89		70-130
STL00996	13C2 PFDA	87		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_008.d
Lims ID: LCS 320-193512/2-A
Client ID:
Sample Type: LCS
Inject. Date: 13-Nov-2017 02:55:55 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-193512/2-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 16:56:27

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.444	-0.018	1.000	12297786	118.2		5614	
298.90 > 99.00	1.426	1.444	-0.018	1.000	9322484		1.32(0.00-0.00)	15946	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1565932	8.87		5699	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.725	-0.026	1.000	7607656	41.2		5926	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.725	-0.026	1.000	1943854	12.9		610	
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.913	-0.024		1604626	10.0		5227	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.889	1.914	-0.025	1.000	3891897	26.2		750	
413.00 > 169.00	1.889	1.914	-0.025	1.000	2046551		1.90(0.00-0.00)	2208	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.124	2.117	0.007	1.000	5449359	52.6		4008	M
499.00 > 99.00	2.124	2.117	0.007	1.000	1143860		4.76(0.00-0.00)	2211	M
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.151	-0.027		3166909	28.7		4491	
9 Perfluorononanoic acid									
463.00 > 419.00	2.132	2.158	-0.026	1.000	2755343	25.9		856	
$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.312	-0.021	1.000	1068735	8.70		7608	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 14-Nov-2017 17:11:59 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_008.d

Injection Date: 13-Nov-2017 02:55:55 Instrument ID: A8_N

Lims ID: LCS 320-193512/2-A

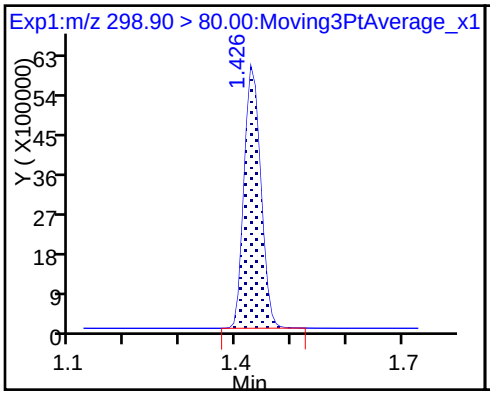
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5

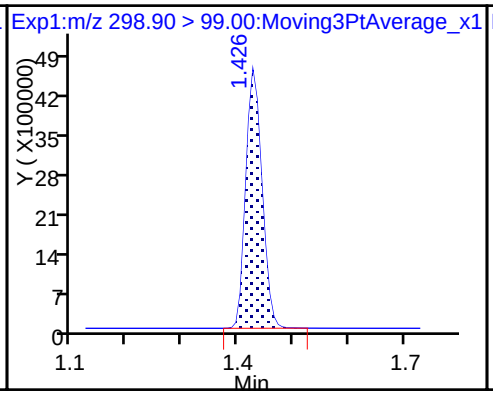
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

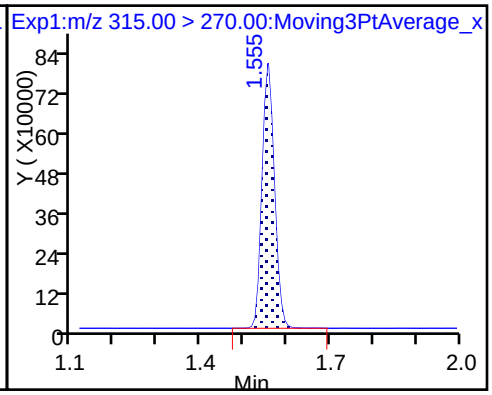
1 Perfluorobutanesulfonic acid



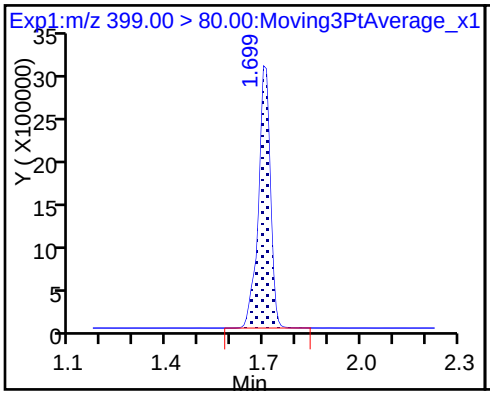
1 Perfluorobutanesulfonic acid



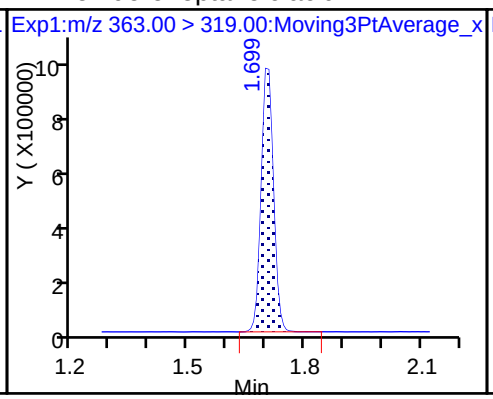
$ 2 13C2 PFHxA



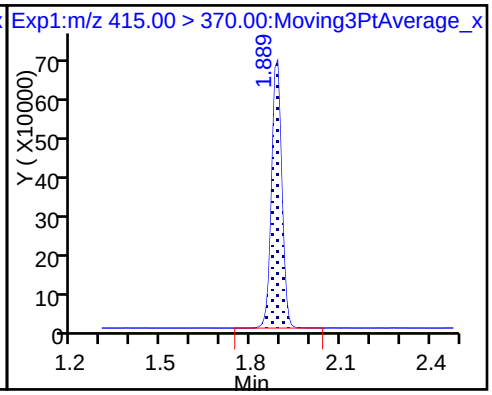
3 Perfluorohexanesulfonic acid



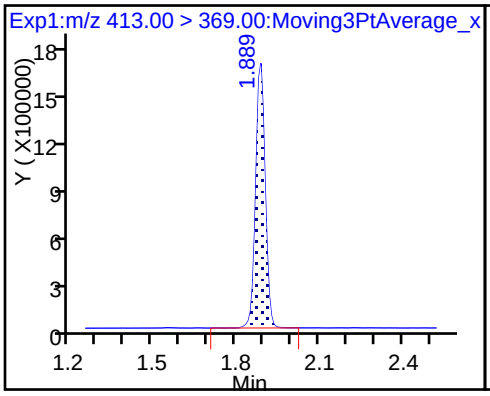
4 Perfluoroheptanoic acid



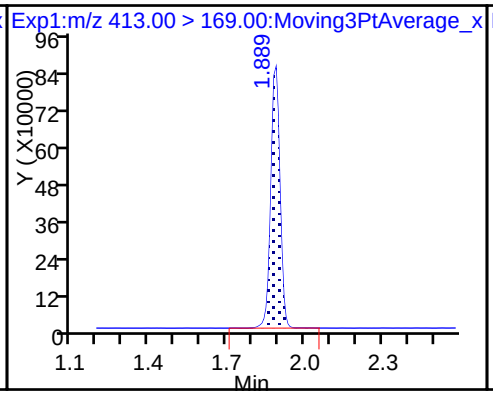
* 6 13C2-PFOA



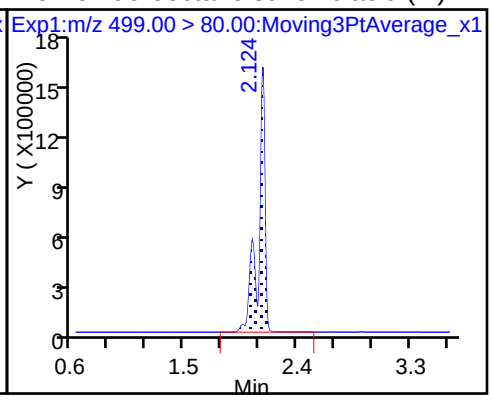
5 Perfluorooctanoic acid



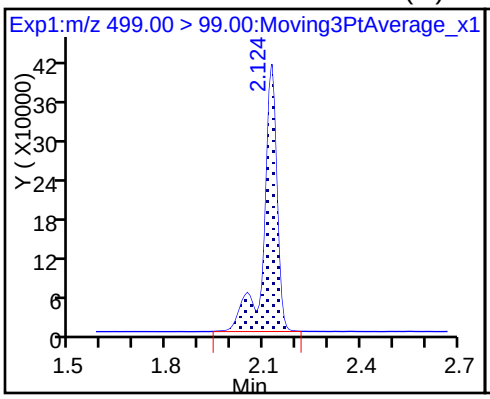
5 Perfluorooctanoic acid



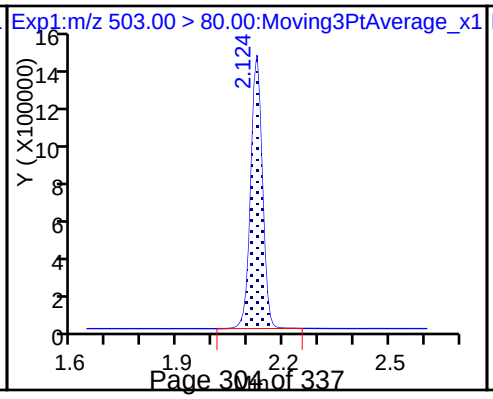
8 Perfluorooctane sulfonic acid (M)



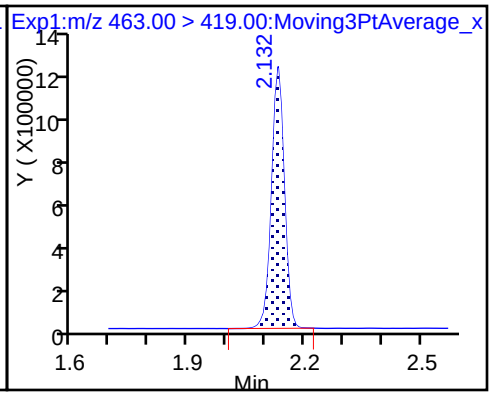
8 Perfluorooctane sulfonic acid (M)



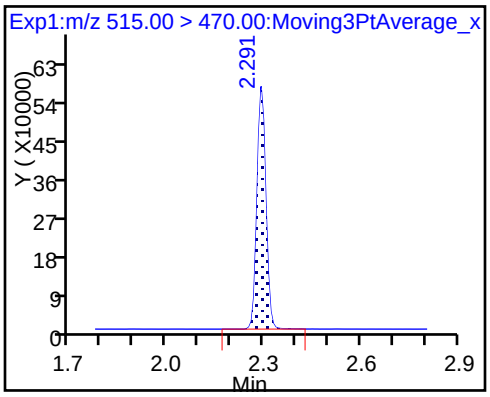
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.291
Y (X10000)
63
54
45
36
27
18
9
0
1.7
2.0
2.3
2.6
2.9
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_008.d				
Lims ID:	LCS 320-193512/2-A				
Client ID:					
Sample Type:	LCS				
Inject. Date:	13-Nov-2017 02:55:55	ALS Bottle#:	2	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	lcs 320-193512/2-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	14-Nov-2017 17:11:56	Calib Date:	03-Nov-2017 14:01:24		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK010				
First Level Reviewer: barnettj		Date:	14-Nov-2017 16:56:27		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.87	88.69
$ 10 13C2 PFDA	10.0	8.70	87.04

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

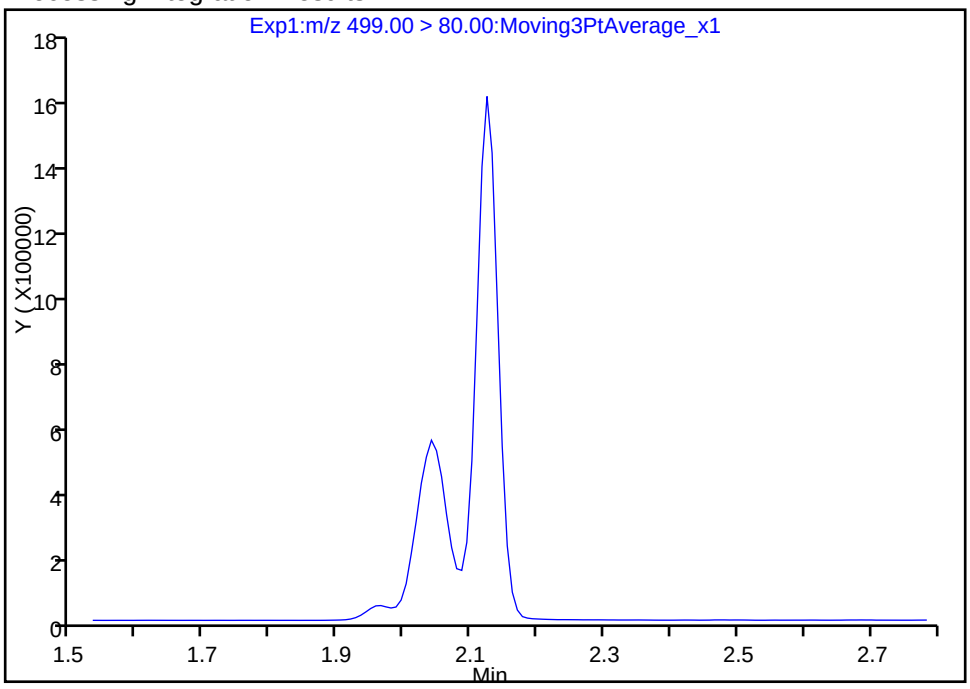
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_008.d
Injection Date: 13-Nov-2017 02:55:55 Instrument ID: A8_N
Lims ID: LCS 320-193512/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

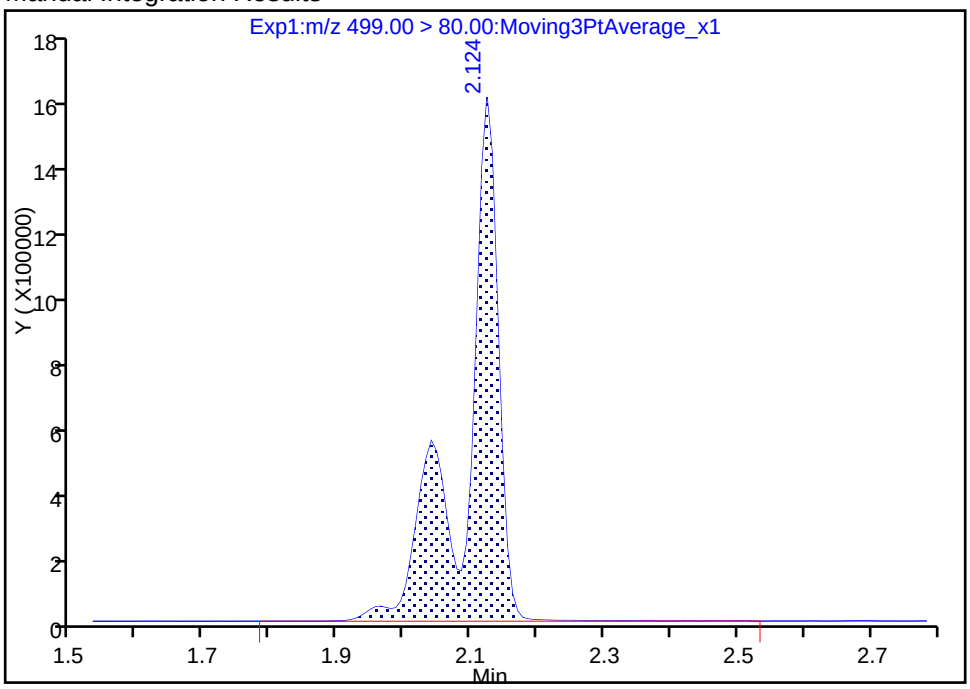
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 5449359
Amount: 52.559003
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:55:54
Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

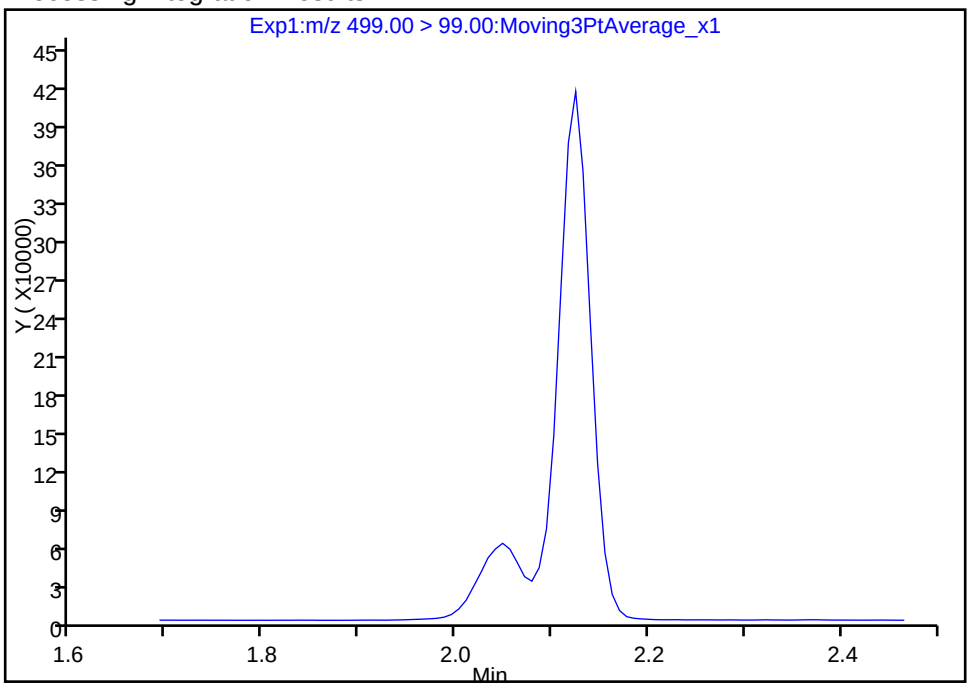
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_008.d
Injection Date: 13-Nov-2017 02:55:55 Instrument ID: A8_N
Lims ID: LCS 320-193512/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

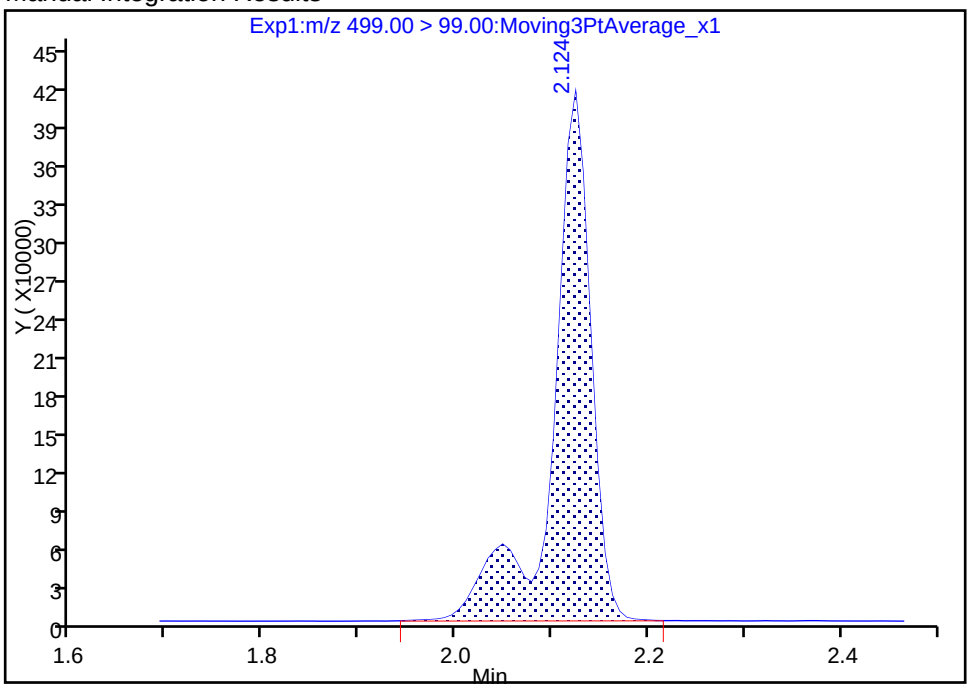
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 1143860
Amount: 52.559003
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:56:07
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

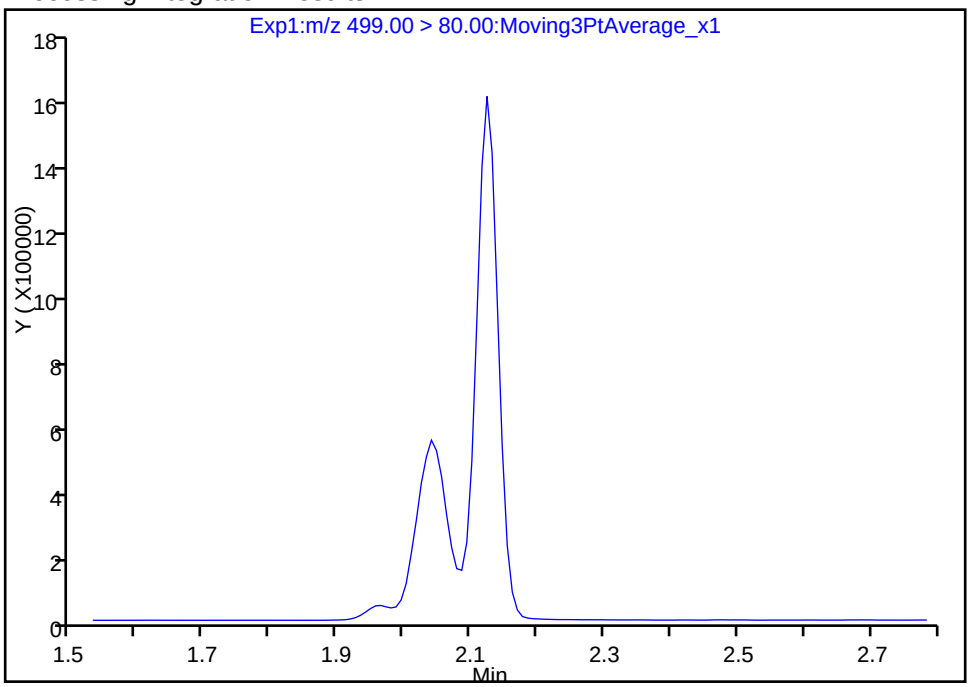
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_008.d
Injection Date: 13-Nov-2017 02:55:55 Instrument ID: A8_N
Lims ID: LCS 320-193512/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

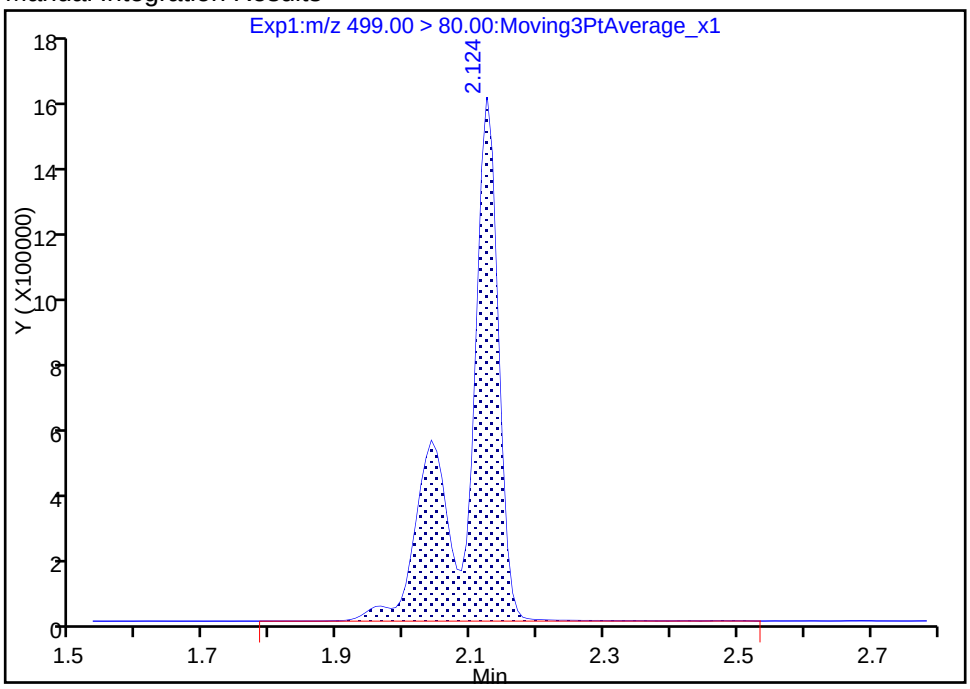
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 5449359
Amount: 52.559003
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:56:07
Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCSD 320-193512/3-A

Matrix: Water | Lab File ID: 2017.11.13_537A_009.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 250.00(mL) | Date Analyzed: 11/13/2017 03:00

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	215	M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	103		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	106		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	169		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	52.2		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	480		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	87		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_009.d
Lims ID: LCSD 320-193512/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 13-Nov-2017 03:00:36 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-193512/3-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 16:57:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.444	-0.018	1.000	12269989	119.9		5532	
298.90 > 99.00	1.426	1.444	-0.018	1.000	9164403		1.34(0.00-0.00)	14563	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.573	-0.018	1.000	1550432	8.66		6396	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.707	1.725	-0.018	1.000	7713481	42.3		7682	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.707	1.725	-0.018	1.000	1987692	13.0		638	
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.913	-0.024		1626963	10.0		5891	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.889	1.914	-0.025	1.000	3886519	25.8		800	
413.00 > 169.00	1.889	1.914	-0.025	1.000	2002386		1.94(0.00-0.00)	2252	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.124	2.117	0.007	1.000	5484877	53.6		3673	M
499.00 > 99.00	2.124	2.117	0.007	1.000	1135675		4.83(0.00-0.00)	2298	M
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.151	-0.027		3122845	28.7		4840	
9 Perfluorononanoic acid									
463.00 > 419.00	2.132	2.158	-0.026	1.000	2863406	26.5		855	
$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.312	-0.021	1.000	1077067	8.65		6513	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 14-Nov-2017 17:12:00 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_009.d

Injection Date: 13-Nov-2017 03:00:36 Instrument ID: A8_N

Lims ID: LCSD 320-193512/3-A

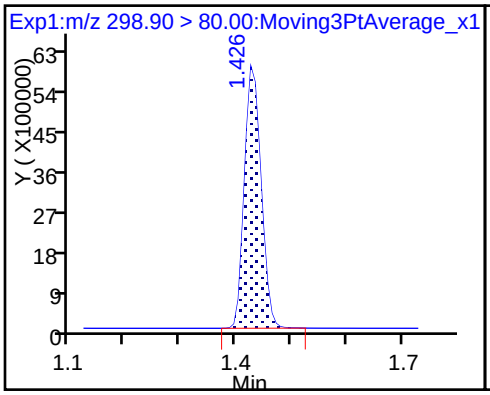
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6

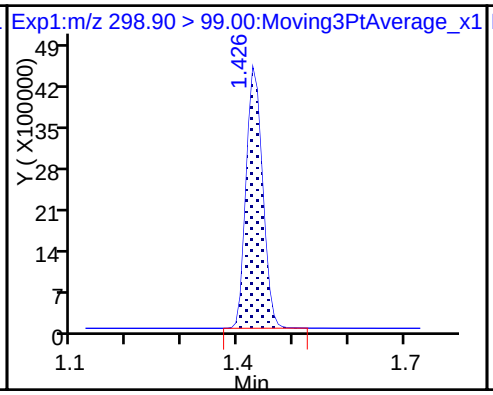
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

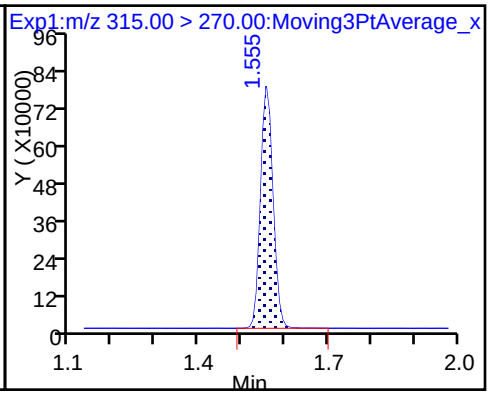
1 Perfluorobutanesulfonic acid



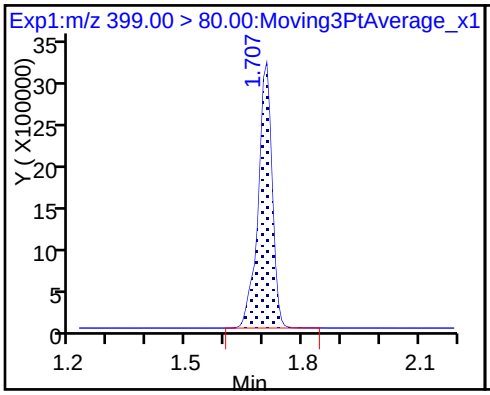
1 Perfluorobutanesulfonic acid



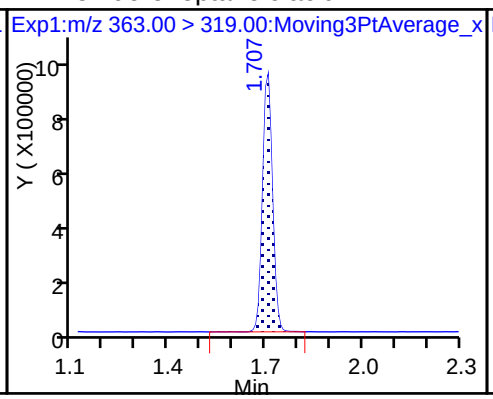
$ 2 13C2 PFHxA



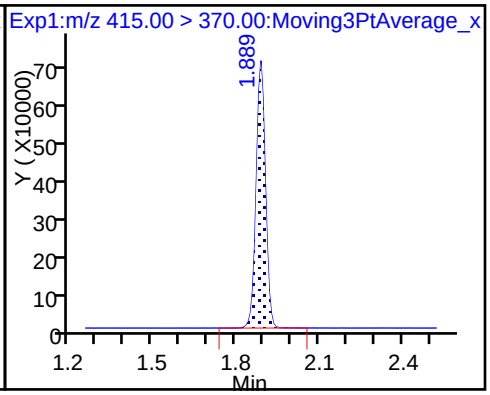
3 Perfluorohexanesulfonic acid



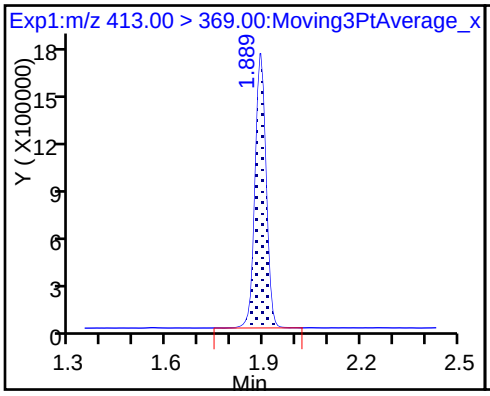
4 Perfluoroheptanoic acid



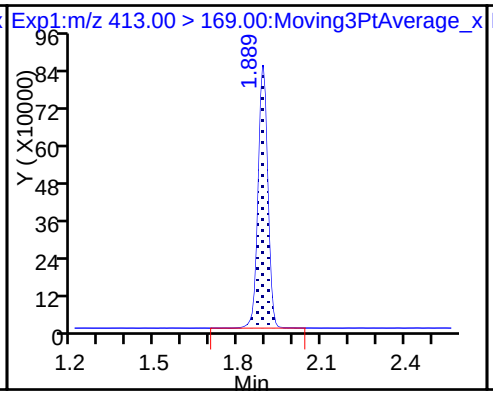
* 6 13C2-PFOA



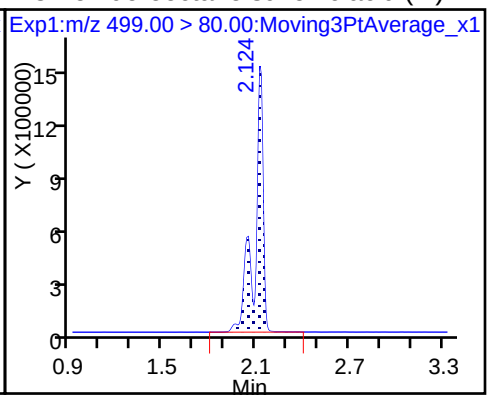
5 Perfluorooctanoic acid



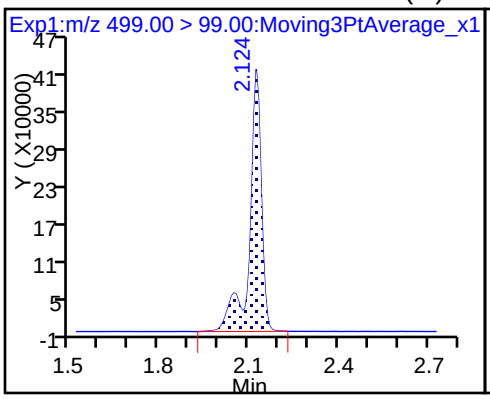
5 Perfluorooctanoic acid



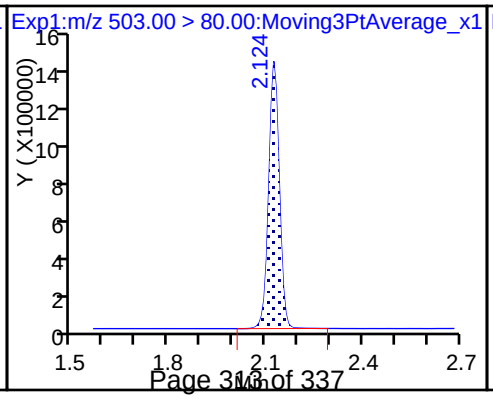
8 Perfluorooctane sulfonic acid (M)



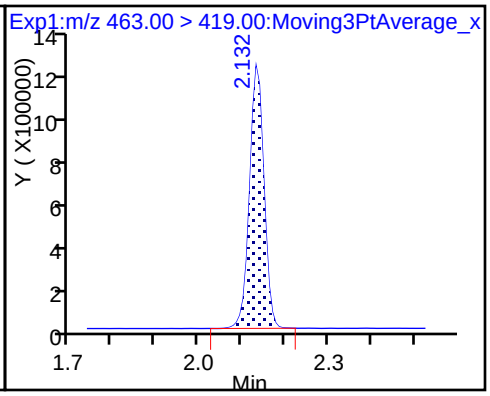
8 Perfluorooctane sulfonic acid (M)



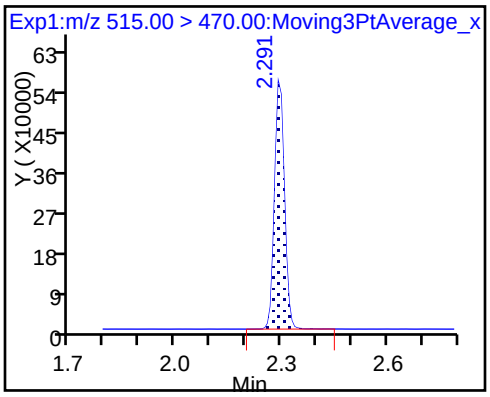
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.291
Y (X10000)
63
54
45
36
27
18
9
0
1.7
2.0
2.3
2.6
Min

TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_009.d
Lims ID: LCSD 320-193512/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 13-Nov-2017 03:00:36 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-193512/3-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 16:57:05

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.66	86.61
$ 10 13C2 PFDA	10.0	8.65	86.51

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

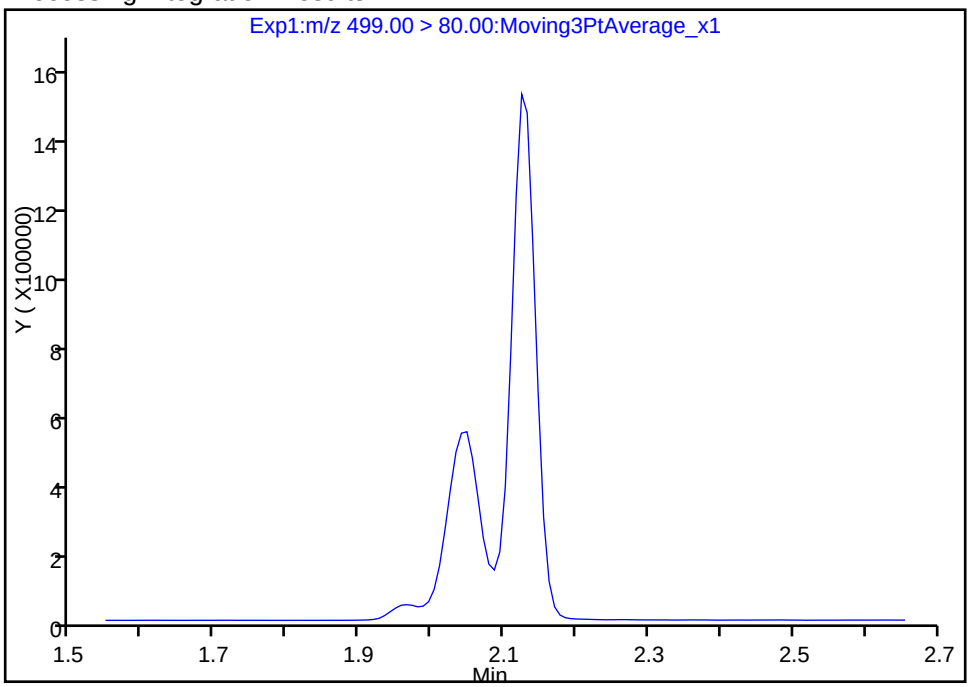
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_009.d
Injection Date: 13-Nov-2017 03:00:36 Instrument ID: A8_N
Lims ID: LCSD 320-193512/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

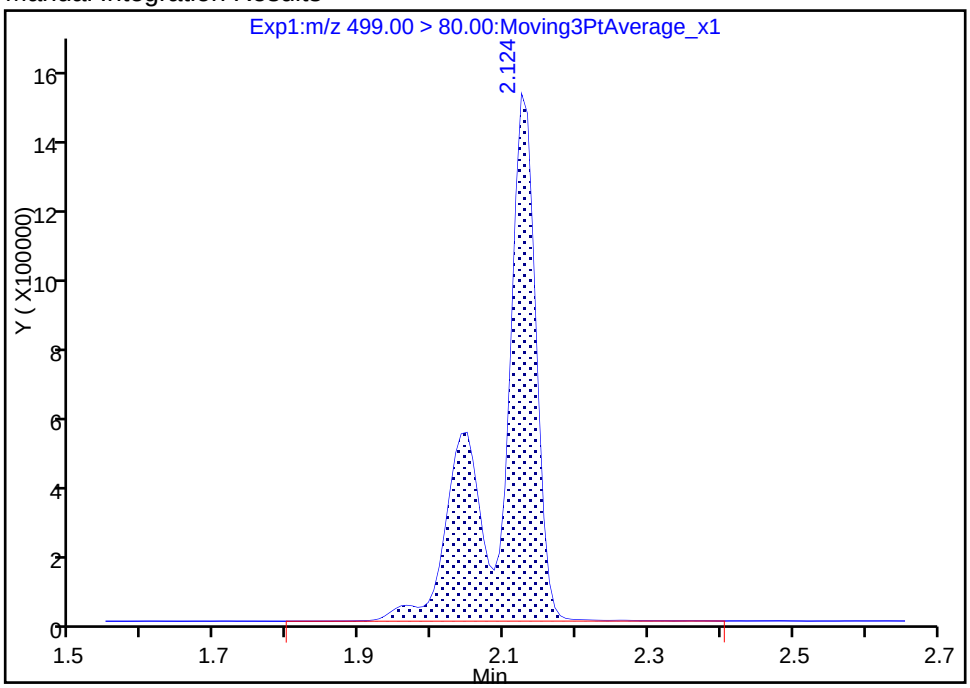
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 5484877
Amount: 53.648026
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:56:34
Audit Action: Assigned Compound ID Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

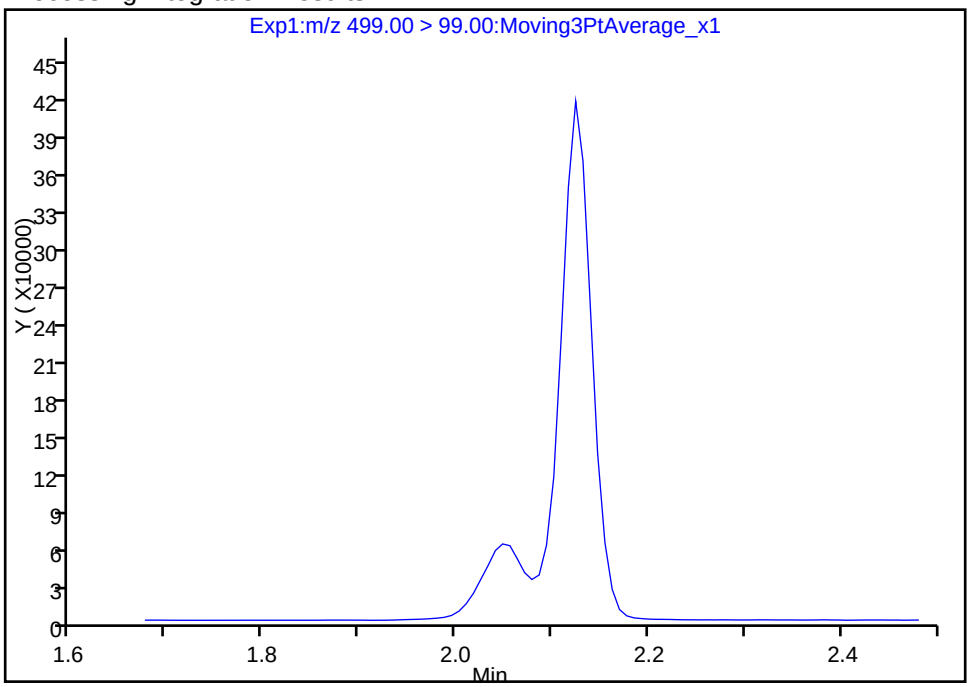
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_009.d
Injection Date: 13-Nov-2017 03:00:36 Instrument ID: A8_N
Lims ID: LCSD 320-193512/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

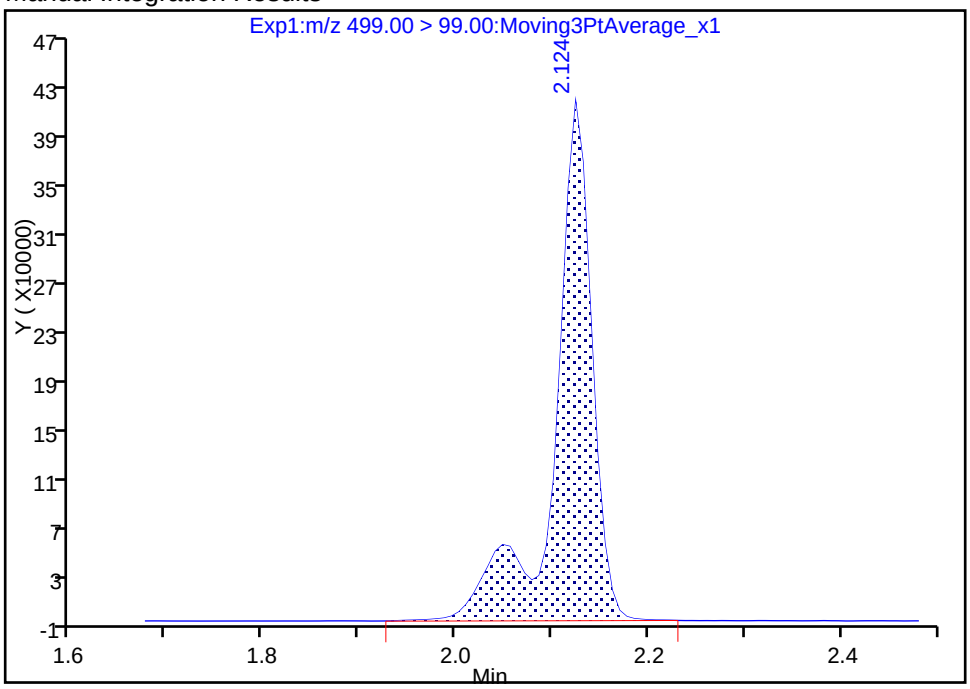
Processing Integration Results

Not Detected
Expected RT: 2.12



Manual Integration Results

RT: 2.12
Area: 1135675
Amount: 53.648026
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:56:47
Audit Action: Manually Integrated Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

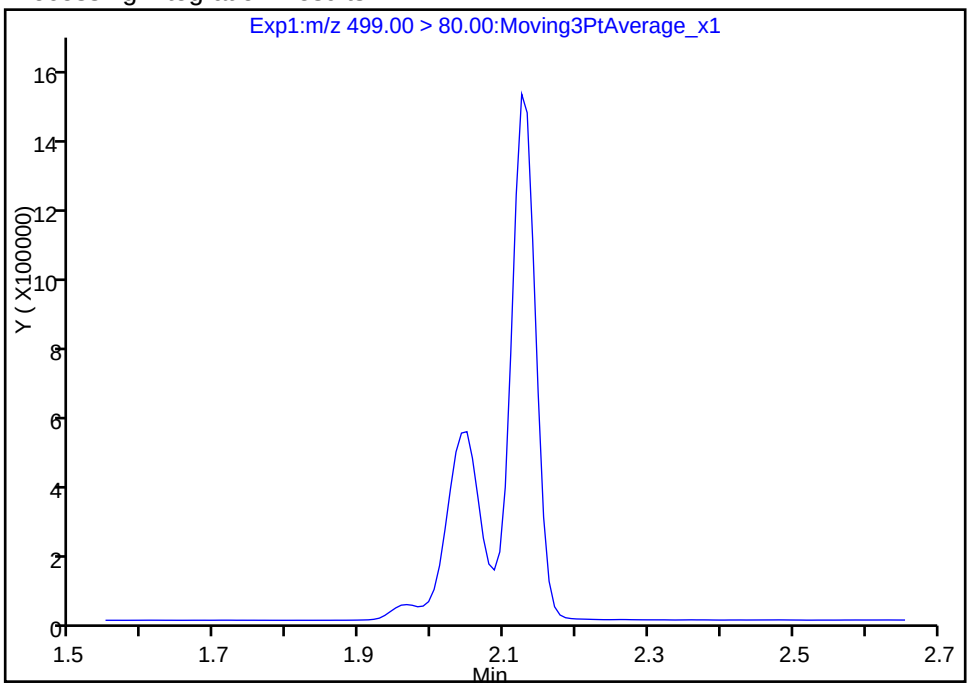
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_009.d
Injection Date: 13-Nov-2017 03:00:36 Instrument ID: A8_N
Lims ID: LCSD 320-193512/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

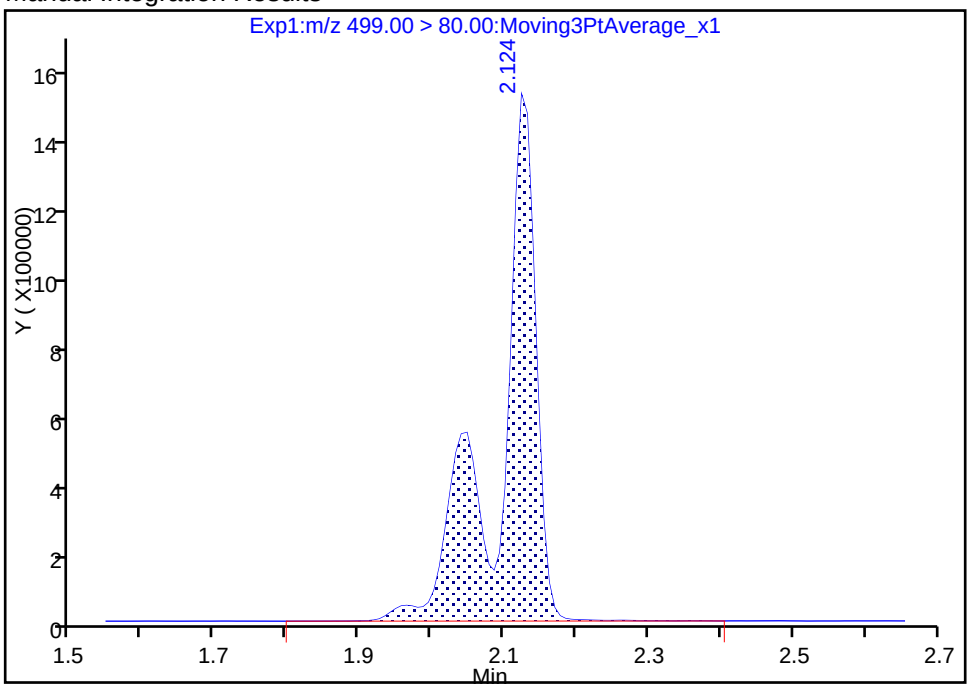
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 5484877
Amount: 53.648026
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:56:47
Audit Action: Manually Integrated Audit Reason: Missed Peak

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Instrument ID: A8_N Start Date: 11/03/2017 13:37

Analysis Batch Number: 192908 End Date: 11/03/2017 14:24

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-192908/4		11/03/2017 13:37	1	2017.11.03_537X ICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-192908/5		11/03/2017 13:42	1	2017.11.03_537X ICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-192908/6		11/03/2017 13:47	1	2017.11.03_537X ICAL 006.d	GeminiC18 3x100 3(mm)
IC 320-192908/7 ICISAV		11/03/2017 13:52	1	2017.11.03_537X ICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-192908/8		11/03/2017 13:56	1	2017.11.03_537X ICAL 008.d	GeminiC18 3x100 3(mm)
IC 320-192908/9		11/03/2017 14:01	1	2017.11.03_537X ICAL 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/03/2017 14:06	1		GeminiC18 3x100 3(mm)
CCVL 320-192908/11		11/03/2017 14:10	1	2017.11.03_537X ICAL 011.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/03/2017 14:15	1		GeminiC18 3x100 3(mm)
ICV 320-192908/13		11/03/2017 14:20	1	2017.11.03_537X ICAL 013.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/03/2017 14:24	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Instrument ID: A8_N Start Date: 11/13/2017 02:37

Analysis Batch Number: 194241 End Date: 11/13/2017 03:38

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-194241/1		11/13/2017 02:37	1	2017.11.13_537A_004.d	GeminiC18 3x100 3(mm)
CCV 320-194241/2 CCVIS		11/13/2017 02:41	1	2017.11.13_537A_005.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/13/2017 02:46	1		GeminiC18 3x100 3(mm)
MB 320-193512/1-A		11/13/2017 02:51	1	2017.11.13_537A_007.d	GeminiC18 3x100 3(mm)
LCS 320-193512/2-A		11/13/2017 02:55	1	2017.11.13_537A_008.d	GeminiC18 3x100 3(mm)
LCSD 320-193512/3-A		11/13/2017 03:00	1	2017.11.13_537A_009.d	GeminiC18 3x100 3(mm)
320-33018-1		11/13/2017 03:05	1	2017.11.13_537A_010.d	GeminiC18 3x100 3(mm)
320-33018-2		11/13/2017 03:09	1	2017.11.13_537A_011.d	GeminiC18 3x100 3(mm)
320-33018-3		11/13/2017 03:14	1	2017.11.13_537A_012.d	GeminiC18 3x100 3(mm)
320-33018-4		11/13/2017 03:19	1	2017.11.13_537A_013.d	GeminiC18 3x100 3(mm)
320-33018-5		11/13/2017 03:24	1	2017.11.13_537A_014.d	GeminiC18 3x100 3(mm)
320-33018-6		11/13/2017 03:28	1	2017.11.13_537A_015.d	GeminiC18 3x100 3(mm)
320-33018-7		11/13/2017 03:33	1	2017.11.13_537A_016.d	GeminiC18 3x100 3(mm)
CCV 320-194241/14 CCVIS		11/13/2017 03:38	1	2017.11.13_537A_017.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Instrument ID: A8_N Start Date: 11/13/2017 03:38

Analysis Batch Number: 194251 End Date: 11/13/2017 04:29

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-194251/14 CCVIS		11/13/2017 03:38	1	2017.11.13_537A_017.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/13/2017 03:42	1		GeminiC18 3x100 3(mm)
320-33018-8		11/13/2017 03:47	1	2017.11.13_537A_019.d	GeminiC18 3x100 3(mm)
320-33018-9		11/13/2017 03:52	1	2017.11.13_537A_020.d	GeminiC18 3x100 3(mm)
320-33018-10		11/13/2017 03:56	1	2017.11.13_537A_021.d	GeminiC18 3x100 3(mm)
320-33018-11		11/13/2017 04:01	1	2017.11.13_537A_022.d	GeminiC18 3x100 3(mm)
320-33018-12		11/13/2017 04:06	1	2017.11.13_537A_023.d	GeminiC18 3x100 3(mm)
320-33018-13		11/13/2017 04:10	1	2017.11.13_537A_024.d	GeminiC18 3x100 3(mm)
320-33018-14		11/13/2017 04:15	1	2017.11.13_537A_025.d	GeminiC18 3x100 3(mm)
320-33018-15		11/13/2017 04:20	1	2017.11.13_537A_026.d	GeminiC18 3x100 3(mm)
320-33018-16		11/13/2017 04:24	1	2017.11.13_537A_027.d	GeminiC18 3x100 3(mm)
CCV 320-194251/25 CCVIS		11/13/2017 04:29	1	2017.11.13_537A_028.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Batch Number: 193512 Batch Start Date: 11/08/17 11:47 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 11/10/17 21:40

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00023
MB 320-193512/1		537, 537				250.00 mL	1.00 mL	7 SU	
LCS 320-193512/2		537, 537				250.00 mL	1.00 mL	7 SU	100 uL
LCSD 320-193512/3		537, 537				250.00 mL	1.00 mL	7 SU	100 uL
320-33018-A-1	NAWC-110217-RW-286	537, 537	T	270.43 g	28.11 g	242.3 mL	1.00 mL	7 SU	
320-33018-A-2	NAWC-110217-FRB-286	537, 537	T	271.04 g	27.17 g	243.9 mL	1.00 mL	7 SU	
320-33018-A-3	WGNA-110217-RW-3978	537, 537	T	273.22 g	27.56 g	245.7 mL	1.00 mL	7 SU	
320-33018-A-4	WGNA-110217-FRB-3978	537, 537	T	274.53 g	27.09 g	247.4 mL	1.00 mL	7 SU	
320-33018-A-5	NAWC-110217-RW-177-IRR	537, 537	T	270.84 g	27.71 g	243.1 mL	1.00 mL	7 SU	
320-33018-A-6	NAWC-110217-FRB-177-IRR	537, 537	T	273.38 g	27.11 g	246.3 mL	1.00 mL	7 SU	
320-33018-A-7	NAWC-110217-RW-177-SHOP	537, 537	T	271.42 g	27.64 g	243.8 mL	1.00 mL	7 SU	
320-33018-A-8	NAWC-110217-FRB-177-SHOP	537, 537	T	278.25 g	27.13 g	251.1 mL	1.00 mL	7 SU	
320-33018-A-9	NAWC-110217-RW-185	537, 537	T	276.72 g	27.58 g	249.1 mL	1.00 mL	7 SU	
320-33018-A-10	NAWC-110217-FRB-185	537, 537	T	278.08 g	27.51 g	250.6 mL	1.00 mL	7 SU	
320-33018-A-11	NAWC-110217-RW-355	537, 537	T	277.12 g	27.81 g	249.3 mL	1.00 mL	7 SU	
320-33018-A-12	NAWC-110217-FRB-355	537, 537	T	272.81 g	27.63 g	245.2 mL	1.00 mL	7 SU	
320-33018-A-13	NAWC-110217-RW-348	537, 537	T	278.13 g	27.83 g	250.3 mL	1.00 mL	7 SU	
320-33018-A-14	NAWC-110217-FRB-348	537, 537	T	279.53 g	27.08 g	252.5 mL	1.00 mL	7 SU	
320-33018-A-15	WGNA-110217-RW-3882	537, 537	T	278.85 g	27.95 g	250.9 mL	1.00 mL	7 SU	
320-33018-A-16	WGNA-110217-FRB-3882	537, 537	T	275.73 g	27.85 g	247.9 mL	1.00 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00050	LC537-SU 00051	AnalysisComment			
MB 320-193512/1		537, 537		100 uL	100 uL	Cl 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.: 320-33018-1

SDG No.:

Batch Number: 193512 Batch Start Date: 11/08/17 11:47 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 11/10/17 21:40

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00050	LC537-SU 00051	AnalysisComment			
LCS 320-193512/2		537, 537		100 uL	100 uL	Cl ND			
LCSD 320-193512/3		537, 537		100 uL	100 uL	Cl ND			
320-33018-A-1	NAWC-110217-RW-286	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-2	NAWC-110217-FRB-286	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-3	WGNA-110217-RW-3978	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-4	WGNA-110217-FRB-3978	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-5	NAWC-110217-RW-177-IRR	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-6	NAWC-110217-FRB-177-IRR	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-7	NAWC-110217-RW-177-SHOP	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-8	NAWC-110217-FRB-177-SHOP	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-9	NAWC-110217-RW-185	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-10	NAWC-110217-FRB-185	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-11	NAWC-110217-RW-355	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-12	NAWC-110217-FRB-355	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-13	NAWC-110217-RW-348	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-14	NAWC-110217-FRB-348	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-15	WGNA-110217-RW-3882	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-16	WGNA-110217-FRB-3882	537, 537	T	100 uL	100 uL	Cl 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.: 320-33018-1

SDG No.:

Batch Number: 193512 Batch Start Date: 11/08/17 11:47 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 11/10/17 21:40

Batch Notes	
Analyst ID - Aliquot Step	TWL
Analyst ID - Concentration	NIGHTS/CCB
Analyst ID - Final Volume Step	CCB
Internal Standard ID#	1041858
Manifold ID	3, 4
Methanol ID	1076416
Pipette ID	M16387D
Analyst ID - IS Reagent Drop	CCB
Analyst ID - IS Reagent Drop Witness	JNS
Analyst ID - SU Reagent Drop	VPM
Analyst ID - SU Reagent Drop Witness	KMK
Analyst ID - TA Reagent Drop	VPM
Analyst ID - TA Reagent Drop Witness	KMK
SPE Cartridge ID	6357081-09
Trizma ID	SLBR4303V
Reagent Water ID	11-2-17

Basis	Basis Description
T	Total/NA

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento

Method 537 CCV/Data Review Checklist

A8

Job No: 33018 Instrument ID & Date: 11-13-17 ICAL Batch: 192908

Extraction Batch: 193512 Worklist #: 50325, 50549 TALS Batch: 194241, 194251, 195210

Review Items	--- Level 1 --- Yes	No	N/A	Level 2
Initial Calibration				
1. Is ICAL verified and locked in Chrom & TALS?	✓			✓
2. Is ICV properly linked in TALS?	✓			✓
Continuing Calibration				
1. **Low-range CCV injected at start of analytical run?** CCV injected after every 10 samples and at the end of the analytical run and alternated between Low-range, Mid-range and High-range?	✓			✓
2. If sequence was not after an ICAL was a low and mid range CCV injected at the start of the analytical run?	✓			✓
3. Native compounds and surrogates in control? Low-range within ±50% of true value Mid and High-range within ±30% of true value	✓			✓
4. Internal Standard areas in control? Areas ≥ 50% of average area of the ICal and 70-140% of the most recent CCV.	✓			✓
Client Samples & QC Sample Results				
1. Were preparation and analysis done within holding times?	✓			✓
2. Are Chromatograms reviewed and spectra verified?	✓			✓
3. Are positive results within calibration range?	✓			✓
4. Dilutions due to target cpds? ____ 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 11-16-17 2nd Level Reviewer / Date: [signature] 11/17/2017

NCM # and Comments: 107642

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento

Method 537 ICAL Checklist

A8

Instrument ID & Date: 11-3-17 Worklist#: 49975

ICAL Batch: 192908, 192909 Calibration ID number: 36012, 36013

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

1st Level Reviewer / Date: JRB 11-6-17 2nd Level Reviewer / Date: [signature] 11/6/2017

NCM # and Comments: _____

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 13NOV2017_537A Worklist Number: 50325
Instrument Name: A8_N Chrom Method: 537_A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b
QC Batching: Enabled Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 194241	LC 537 CS ICAL Raw Batch: 194242
# 1 CCVL	# 1 CCVL	# 1 CCVL
# 2 CCV L3	# 2 CCV L3	# 2 CCV L3
# 3 RB	# 3 RB	# 3 RB
# 4 MB 320-193512/1-A	# 4 MB 320-193512/1-A	
# 5 LCS 320-193512/2-A	# 5 LCS 320-193512/2-A	
# 6 LCSD 320-193512/3-A	# 6 LCSD 320-193512/3-A	
# 7 320-33018-A-1-A	# 7 320-33018-A-1-A	
# 8 320-33018-A-2-A	# 8 320-33018-A-2-A	
# 9 320-33018-A-3-A	# 9 320-33018-A-3-A	
#10 320-33018-A-4-A	#10 320-33018-A-4-A	
#11 320-33018-A-5-A	#11 320-33018-A-5-A	
#12 320-33018-A-6-A	#12 320-33018-A-6-A	
#13 320-33018-A-7-A	#13 320-33018-A-7-A	
#14 CCV L5	#14 CCV L5	

QC Batch: 2	LC 537 ICAL Raw Batch: 194251	LC 537 CS ICAL Raw Batch: 194252
#14 CCV L5	#14 CCV L5	
#15 RB	#15 RB	
#16 320-33018-A-8-A	#16 320-33018-A-8-A	
#17 320-33018-A-9-A	#17 320-33018-A-9-A	
#18 320-33018-A-10-A	#18 320-33018-A-10-A	
#19 320-33018-A-11-A	#19 320-33018-A-11-A	
#20 320-33018-A-12-A	#20 320-33018-A-12-A	
#21 320-33018-A-13-A	#21 320-33018-A-13-A	
#22 320-33018-A-14-A	#22 320-33018-A-14-A	
#23 320-33018-A-15-A	#23 320-33018-A-15-A	
#24 320-33018-A-16-A	#24 320-33018-A-16-A	
#25 CCV L3	#25 CCV L3	#25 CCV L3

QC Batch: 3	LC 537 ICAL Raw Batch: 194253	LC 537 CS ICAL Raw Batch: 194254
#25 CCV L3	#25 CCV L3	#25 CCV L3
#26 RB	#26 RB	#26 RB
#27 MB 320-193312/1-A		#27 MB 320-193312/1-A
#28 LCS 320-193312/2-A		#28 LCS 320-193312/2-A
#29 LCSD 320-193312/3-A		#29 LCSD 320-193312/3-A
#30 320-33007-A-1-B		#30 320-33007-A-1-B
#31 320-33007-A-2-B		#31 320-33007-A-2-B
#32 320-33007-A-3-D		#32 320-33007-A-3-D
#33 320-33007-A-3-E MS		#33 320-33007-A-3-E MS
#34 320-33007-A-3-F MSD		#34 320-33007-A-3-F MSD
#35 320-33007-A-4-B		#35 320-33007-A-4-B
#36 320-33007-A-5-B		#36 320-33007-A-5-B
#37 CCV L5		#37 CCV L5

QC Batch: 4	LC 537 CS ICAL Raw Batch: 194255
#37 CCV L5	#37 CCV L5
#38 RB	#38 RB

QC Batch: 4	LC 537 CS ICAL Raw Batch: 194255
#39 MB 320-193285/1-A	#39 MB 320-193285/1-A
#40 LCS 320-193285/2-A	#40 LCS 320-193285/2-A
#41 LCSD 320-193285/3-A	#41 LCSD 320-193285/3-A
#42 320-33003-A-1-A	#42 320-33003-A-1-A
#43 320-33003-A-2-A	#43 320-33003-A-2-A
#44 320-33003-A-3-A	#44 320-33003-A-3-A
#45 320-33003-A-4-A	#45 320-33003-A-4-A
#46 320-33003-A-5-A	#46 320-33003-A-5-A
#47 320-33003-A-6-A	#47 320-33003-A-6-A
#48 320-33003-A-7-A	#48 320-33003-A-7-A
#49 CCV L3	#49 CCV L3

QC Batch: 5	LC 537 CS ICAL Raw Batch: 194256
#49 CCV L3	#49 CCV L3
#50 RB	#50 RB
#51 320-33003-A-8-A	#51 320-33003-A-8-A
#52 320-33003-A-8-B MS	#52 320-33003-A-8-B MS
#53 320-33003-A-8-C MSD	#53 320-33003-A-8-C MSD
#54 320-33003-A-9-A	#54 320-33003-A-9-A
#55 320-33003-A-10-A	#55 320-33003-A-10-A
#56 320-33006-A-1-A	#56 320-33006-A-1-A
#57 320-33006-A-2-A	#57 320-33006-A-2-A
#58 320-33006-A-3-A	#58 320-33006-A-3-A
#59 320-33006-A-4-A	#59 320-33006-A-4-A
#60 320-33006-A-5-A	#60 320-33006-A-5-A
#61 CCV L5	#61 CCV L5

QC Batch: 6	LC 537 CS ICAL Raw Batch: 194257	LC 537 ICAL Raw Batch: 194258
#61 CCV L5	#61 CCV L5	
#62 RB	#62 RB	
#63 320-33006-A-6-A	#63 320-33006-A-6-A	
#64 CCV L3	#64 CCV L3	
#65 RB	#65 RB	#65 RB

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

79 AB 11/12/17 AB 11/15/17

Batch Number: 320-193512 Analyst: Kolstad, Kate M Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537_Prep-320 Batch End: 11/10/2017 9:40:00PM

Extraction of Perfluorinated Alkyl Acids

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-193512/1 N/A	N/A		250.00 mL 1.00 mL	7			N/A	N/A	N/A	Cl ND	
2	LCS~320-193512/2 N/A	N/A		250.00 mL 1.00 mL	7			N/A	N/A	N/A	Cl ND	
3	LCSD~320-193512/3 N/A	N/A		250.00 mL 1.00 mL	7			N/A	N/A	N/A	Cl ND	
4	320-33018-A-1 (537_DOD5)	N/A (320-33018-1)	270.43 g 28.11 g	242.3 mL 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
5	320-33018-A-2 (537_DOD5)	N/A (320-33018-1)	271.04 g 27.17 g	243.9 mL 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
6	320-33018-A-3 (537_DOD5)	N/A (320-33018-1)	273.22 g 27.56 g	245.7 mL 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
7	320-33018-A-4 (537_DOD5)	N/A (320-33018-1)	274.53 g 27.09 g	247.4 mL 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
8	320-33018-A-5 (537_DOD5)	N/A (320-33018-1)	270.84 g 27.71 g	243.1 mL 1.00 mL	7			11/7/17	16_Days	4	Cl ND RI	
9	320-33018-A-6 (537_DOD5)	N/A (320-33018-1)	273.38 g 27.11 g	246.3 mL 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
10	320-33018-A-7 (537_DOD5)	N/A (320-33018-1)	271.42 g 27.64 g	243.8 mL 1.00 mL	7			11/7/17	16_Days	4	Cl ND RI	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512 Analyst: Kolstad, Kate M Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537_Prep-320 Batch End: 11/10/2017 9:40:00PM

11	320-33018-A-8 (537_DOD5)	N/A (320-33018-1)	278.25 g 27.13 g	251.1 mL 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
12	320-33018-A-9 (537_DOD5)	N/A (320-33018-1)	276.72 g 27.58 g	249.1 mL 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
13	320-33018-A-10 (537_DOD5)	N/A (320-33018-1)	278.08 g 27.51 g	250.6 mL 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
14	320-33018-A-11 (537_DOD5)	N/A (320-33018-1)	277.12 g 27.81 g	249.3 mL 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
15	320-33018-A-12 (537_DOD5)	N/A (320-33018-1)	272.81 g 27.63 g	245.2 mL 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
16	320-33018-A-13 (537_DOD5)	N/A (320-33018-1)	278.13 g 27.83 g	250.3 mL 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
17	320-33018-A-14 (537_DOD5)	N/A (320-33018-1)	279.53 g 27.08 g	252.5 mL 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
18	320-33018-A-15 (537_DOD5)	N/A (320-33018-1)	278.85 g 27.95 g	250.9 mL 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
19	320-33018-A-16 (537_DOD5)	N/A (320-33018-1)	275.73 g 27.85 g	247.9 mL 1.00 mL	7			11/7/17	16_Days	4	Cl ND	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512 Analyst: Kolstad, Kate M Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537_Prep-320 Batch End: 11/10/2017 9:40:00PM

Batch Notes

Manifold ID	3, 4
Trizma ID	SLBR4303V
SPE Cartridge ID	6357081-09
Methanol ID	1076416
Reagent Water ID	11-2-17
Internal Standard ID#	1041858
Pipette ID	M16387D
Analyst ID - TA Reagent Drop	VPM
Analyst ID - TA Reagent Drop Witness	KMK
Analyst ID - SU Reagent Drop	VPM
Analyst ID - SU Reagent Drop Witness	KMK
Analyst ID - IS Reagent Drop	CCB
Analyst ID - IS Reagent Drop Witness	JNS
Analyst ID - Concentration	NIGHTS/CCB
Analyst ID - Aliquot Step	TWL
Analyst ID - Final Volume Step	CCB
Batch Comment	NA

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512 Analyst: Kolstad, Kate M Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537_Prep-320 Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-193512/1	LC537-SU_00051	100 uL	1.00 mL	VPM 11/8/17	KMK 11-8-17
LCS 320-193512/2	LC537-HSP_00023	100 uL	1.00 mL		
LCS 320-193512/2	LC537-SU_00051	100 uL	1.00 mL		
LCSD 320-193512/3	LC537-HSP_00023	100 uL	1.00 mL		
LCSD 320-193512/3	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-1	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-2	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-3	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-4	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-5	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-6	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-7	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-8	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-9	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-10	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-11	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-12	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-13	LC537-SU_00051	100 uL	1.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512 Analyst: Kolstad, Kate M Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537_Prep-320 Batch End:

320-33018-A-14	LC537-SU_00051	100 uL	1.00 mL	VPM 11/8/17	kmk 11-8-17
320-33018-A-15	LC537-SU_00051	100 uL	1.00 mL	↓	↓
320-33018-A-16	LC537-SU_00051	100 uL	1.00 mL	↓	↓

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s) 193512 Test 537_Prep

Earliest Holding Time 11-16-17

Batch Information	1st Level Reviewer	2nd Level Reviewer
Date and time accurate and entered into TALS correctly	✓	✓
All necessary batch information complete and entered into TALS correctly	✓	✓
BD, FV, and AL initials are transcribed into the batch comment	✓	✓
Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
Holding time violation NCM filed	NA	NA
MS/MSD or MS/DU NCM filed	NA	NA
NCM for any anomalies filed	NA	NA
All NCMs include method code, matrix, and prep batch	NA	NA
Method/sample/login/QAS checked and correct	✓	✓
Batch contains no more than 20 live samples	✓	✓
Worksheet Tab	1st Level Reviewer	2nd Level Reviewer
All samples properly preserved	✓	✓
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check)	✓	✓
The pH is transcribed properly in TALS	✓	✓
All additional information is transcribed into TALS and is correct and raw data is attached	✓	✓
Comments/Observations are transcribed correctly in TALS	✓	✓
Reagents Tab	1st Level Reviewer	2nd Level Reviewer
All necessary reagents not expired and checked into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Internal Standard is added to the reagents	✓	✓
All units are correctly transcribed into TALS	✓	✓

1st Level Reviewer: TWL Date: 11/10/17

2nd Level Reviewer: VPM Date: 11/11/17

Comments: _____

Shipping and Receiving Documents

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605-1500
phone 916.373.5600 fax 303.467.7248

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

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

Client Contact	Project Manager: Andy Frebowitz	Site Contact: Mary Kay Bond	Date: 11/2/2017	COC No:
TetraTech	Tel/Fax: 610.382.1170	Lab Contact: Dave Alltucker	Carrier: FedEx	1 of 1 COCs
234 Mall Boulevard Suite 260	Analysis Turnaround Time			Sampler: Mary Kay Bond
King of Prussia, PA 19406	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
610-382-1174	TAT if different from Below 21			Walk-in Client:
610-491-9688	☐ 2 weeks			Lab Sampling:
Project Name: WE04	☐ 1 week			
Site: WE04	☐ 2 days			Job / SDG No.:
P O # 1132358 (through EarthToxics)	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y / N)	EPA 537 UCMR3	Sample Specific Notes:
NAWC-110217-RW-286	11/2/2017	08:10	G	DW	2	N	N	Y	
NAWC-110217-FRB-286	11/2/2017	08:05	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-110217-RW-3978	11/2/2017	08:40	G	DW	2	N	N	Y	
WGNA-110217-FRB-3978	11/2/2017	08:35	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-110217-RW-177-IRR	11/2/2017	09:10	G	DW	2	N	N	Y	
NAWC-110217-FRB-177-IRR	11/2/2017	09:05	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-110217-RW-177-SHOP	11/2/2017	9:20	G	DW	2	N	N	Y	
NAWC-110217-FRB-177-SHOP	11/2/2017	9:15	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-110217-RW-185	11/2/2017	10:10	G	DW	2	N	N	Y	
NAWC-110217-FRB-185	11/2/2017	10:05	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-110217-RW-355	11/2/2017	10:40	G	DW	2	N	N	Y	
NAWC-110217-FRB-355	11/2/2017	10:35	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-110217-RW-348	11/2/2017	11:40	G	DW	2	N	N	Y	
NAWC-110217-FRB-348	11/2/2017	11:35	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-110217-RW-3882	11/2/2017	15:40	G	DW	2	N	N	Y	
WGNA-110217-FRB-3882	11/2/2017	15:35	G	DW	2	N	N	Y	Field Reagent Blank
*label NAWC-110217-FRB-IRR AA 11/04/17									

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

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the

☑ 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

Fed Ex Tracking: 770649711525 (2 Coolers)

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 3.2 1.4 Corr'd: ✓ | Therm ID No.: AK-2

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Tetra Tech	11/2/2017 18:00		TAMS	11/03/17 900
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:		Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.11, dated 1/24/2017

320-33018 Chain of Custody

S:\WillowGrove PFOs Private Well\COCs TT\COC 20171102

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-33018-1

Login Number: 33018
List Number: 1
Creator: Turpen, Troy

List Source: TestAmerica Sacramento

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

"NAWC-110217-RW-286","537","RES","320-33018-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","21","ng/L","J M","7.0","DL","","TRG","","","41","LOQ","YES","-99","","242.3","1.00","17",""
"NAWC-110217-RW-286","537","RES","320-33018-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","16","ng/L","J","2.9","DL","","TRG","","","21","LOQ","YES","-99","","242.3","1.00","8.3",""
"NAWC-110217-RW-286","537","RES","320-33018-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","6.5","ng/L","J","5.7","DL","","TRG","","","31","LOQ","YES","-99","","242.3","1.00","12",""
"NAWC-110217-RW-286","537","RES","320-33018-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","37","ng/L","U","17","DL","","TRG","","","93","LOQ","YES","-99","","242.3","1.00","37",""
"NAWC-110217-RW-286","537","RES","320-33018-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.9","ng/L","J","2.0","DL","","TRG","","","10","LOQ","YES","-99","","242.3","1.00","4.1",""
"NAWC-110217-RW-286","537","RES","320-33018-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","21","ng/L","U M","8.3","DL","","TRG","","","25","LOQ","YES","-99","","242.3","1.00","21",""
"NAWC-110217-RW-286","537","RES","320-33018-1","TALSAC","STL00993","13C2 PFHxA","35","ng/L","","-99","DL","","SURR","84","","-99","LOQ","YES","41.3","","242.3","1.00","0",""
"NAWC-110217-RW-286","537","RES","320-33018-1","TALSAC","STL00996","13C2 PFDA","33","ng/L","","-99","DL","","SURR","79","","-99","LOQ","YES","41.3","","242.3","1.00","0",""
"NAWC-110217-FRB-185","537","RES","320-33018-10","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250.6","1.00","16",""
"NAWC-110217-FRB-185","537","RES","320-33018-10","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250.6","1.00","8.0",""
"NAWC-110217-FRB-185","537","RES","320-33018-10","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250.6","1.00","12",""
"NAWC-110217-FRB-185","537","RES","320-33018-10","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250.6","1.00","36",""
"NAWC-110217-FRB-185","537","RES","320-33018-10","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250.6","1.00","4.0",""
"NAWC-110217-FRB-185","537","RES","320-33018-10","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250.6","1.00","20",""
"NAWC-110217-FRB-185","537","RES","320-33018-10","TALSAC","STL00993","13C2 PFHxA","35","ng/L","","-99","DL","","SURR","87","","-99","LOQ","YES","39.9","","250.6","1.00","0",""
"NAWC-110217-FRB-185","537","RES","320-33018-10","TALSAC","STL00996","13C2 PFDA","35","ng/L","","-99","DL","","SURR","88","","-99","LOQ","YES","39.9","","250.6","1.00","0",""
"NAWC-110217-RW-355","537","RES","320-33018-11","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","9.2","ng/L","J","6.8","DL","","TRG","","","40","LOQ","YES","-99","","249.3","1.00","16",""
"NAWC-110217-RW-355","537","RES","320-33018-11","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.8","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","249.3","1.00","8.0",""
"NAWC-110217-RW-355","537","RES","320-33018-11","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","6.1","ng/L","J","5.5","DL","","TRG","","","30","LOQ","YES","-99","","249.3","1.00","12",""
"NAWC-110217-RW-355","537","RES","320-33018-11","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","249.3","1.00","36",""
"NAWC-110217-RW-355","537","RES","320-33018-11","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","2.3","ng/L","J M","1.9","DL","","TRG","","","10","LOQ","YES","-99","","249.3","1.00","4.0",""
"NAWC-110217-RW-355","537","RES","320-33018-11","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U M","8.0","DL","","TRG","","","24","LOQ","YES","-99","","249.3","1.00","20",""
"NAWC-110217-RW-355","537","RES","320-33018-11","TALSAC","STL00993","13C2 PFHxA","31","ng/L","","-99","DL","","SURR","77","","-99","LOQ","YES","40.1","","249.3","1.00","0",""
"NAWC-110217-RW-355","537","RES","320-33018-11","TALSAC","STL00996","13C2 PFDA","33","ng/L","","-99","DL","","SURR","82","","-99","LOQ","YES","40.1","","249.3","1.00","0",""
"NAWC-110217-FRB-355","537","RES","320-33018-12","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.9","DL","","TRG","","","41","LOQ","YES","-99","","245.2","1.00","16",""
"NAWC-110217-FRB-355","537","RES","320-33018-12","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.2","ng/L","U","2.9","DL","","TRG","","","20","LOQ","YES","-99","","245.2","1.00","8.2",""
"NAWC-110217-FRB-355","537","RES","320-33018-12","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS)","12","ng/L","U","5.6","DL","","TRG","","","31","LOQ","YES","-99","","245.2","1.00","12",""
"NAWC-110217-FRB-355","537","RES","320-33018-12","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","37","ng/L","U","16","DL","","TRG","","","92","LOQ","YES","-99","","245.2","1.00","37",""
"NAWC-110217-FRB-355","537","RES","320-33018-12","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.1","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","245.2","1.00","4.1",""
"NAWC-110217-FRB-355","537","RES","320-33018-12","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.2","DL","","TRG","","","24","LOQ","YES","-99","","245.2","1.00","20",""
"NAWC-110217-FRB-355","537","RES","320-33018-12","TALSAC","STL00993","13C2
PFHxA","36","ng/L","","-99","DL","","SURR","89","","-99","LOQ","YES","40.8","","245.2","1.00","0",""
"NAWC-110217-FRB-355","537","RES","320-33018-12","TALSAC","STL00996","13C2
PFDA","34","ng/L","","-99","DL","","SURR","82","","-99","LOQ","YES","40.8","","245.2","1.00","0",""
"NAWC-110217-RW-348","537","RES","320-33018-13","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","33","ng/L","J","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250.3","1.00","16",""
"NAWC-110217-RW-348","537","RES","320-33018-13","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","19","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250.3","1.00","8.0",""
"NAWC-110217-RW-348","537","RES","320-33018-13","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","10","ng/L","J","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250.3","1.00","12",""
"NAWC-110217-RW-348","537","RES","320-33018-13","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250.3","1.00","36",""
"NAWC-110217-RW-348","537","RES","320-33018-13","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.7","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250.3","1.00","4.0",""
"NAWC-110217-RW-348","537","RES","320-33018-13","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U M","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250.3","1.00","20",""
"NAWC-110217-RW-348","537","RES","320-33018-13","TALSAC","STL00993","13C2
PFHxA","33","ng/L","","-99","DL","","SURR","82","","-99","LOQ","YES","40.0","","250.3","1.00","0",""
"NAWC-110217-RW-348","537","RES","320-33018-13","TALSAC","STL00996","13C2
PFDA","33","ng/L","","-99","DL","","SURR","83","","-99","LOQ","YES","40.0","","250.3","1.00","0",""
"NAWC-110217-FRB-348","537","RES","320-33018-14","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.7","DL","","TRG","","","40","LOQ","YES","-99","","252.5","1.00","16",""
"NAWC-110217-FRB-348","537","RES","320-33018-14","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","7.9","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","252.5","1.00","7.9",""
"NAWC-110217-FRB-348","537","RES","320-33018-14","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.4","DL","","TRG","","","30","LOQ","YES","-99","","252.5","1.00","12",""
"NAWC-110217-FRB-348","537","RES","320-33018-14","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","89","LOQ","YES","-99","","252.5","1.00","36",""
"NAWC-110217-FRB-348","537","RES","320-33018-14","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","9.9","LOQ","YES","-99","","252.5","1.00","4.0",""
"NAWC-110217-FRB-348","537","RES","320-33018-14","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","7.9","DL","","TRG","","","24","LOQ","YES","-99","","252.5","1.00","20",""
"NAWC-110217-FRB-348","537","RES","320-33018-14","TALSAC","STL00993","13C2
PFHxA","36","ng/L","","-99","DL","","SURR","90","","-99","LOQ","YES","39.6","","252.5","1.00","0",""
"NAWC-110217-FRB-348","537","RES","320-33018-14","TALSAC","STL00996","13C2
PFDA","35","ng/L","","-99","DL","","SURR","88","","-99","LOQ","YES","39.6","","252.5","1.00","0",""
"WGNA-110217-RW-3882","537","RES","320-33018-15","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","9.0","ng/L","J","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250.9","1.00","16",""
"WGNA-110217-RW-3882","537","RES","320-33018-15","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","7.1","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250.9","1.00","8.0",""
"WGNA-110217-RW-3882","537","RES","320-33018-15","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","8.2","ng/L","J","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250.9","1.00","12",""
"WGNA-110217-RW-3882","537","RES","320-33018-15","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250.9","1.00","36",""
"WGNA-110217-RW-3882","537","RES","320-33018-15","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.7","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250.9","1.00","4.0",""
"WGNA-110217-RW-3882","537","RES","320-33018-15","TALSAC","375-95-1","Perfluorononanoic acid

(PFNA)","20","ng/L","U M","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250.9","1.00","20",""
"WGNA-110217-RW-3882","537","RES","320-33018-15","TALSAC","STL00993","13C2
PFHxA","33","ng/L","","-99","DL","","SURR","83","","-99","LOQ","YES","39.9","","250.9","1.00","0",""
"WGNA-110217-RW-3882","537","RES","320-33018-15","TALSAC","STL00996","13C2
PFDA","34","ng/L","","-99","DL","","SURR","84","","-99","LOQ","YES","39.9","","250.9","1.00","0",""
"WGNA-110217-FRB-3882","537","RES","320-33018-16","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.9","DL","","TRG","","","40","LOQ","YES","-99","","247.9","1.00","16",""
"WGNA-110217-FRB-3882","537","RES","320-33018-16","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","8.1","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","247.9","1.00","8.1",""
"WGNA-110217-FRB-3882","537","RES","320-33018-16","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","247.9","1.00","12",""
"WGNA-110217-FRB-3882","537","RES","320-33018-16","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","91","LOQ","YES","-99","","247.9","1.00","36",""
"WGNA-110217-FRB-3882","537","RES","320-33018-16","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","247.9","1.00","4.0",""
"WGNA-110217-FRB-3882","537","RES","320-33018-16","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.1","DL","","TRG","","","24","LOQ","YES","-99","","247.9","1.00","20",""
"WGNA-110217-FRB-3882","537","RES","320-33018-16","TALSAC","STL00993","13C2
PFHxA","34","ng/L","","-99","DL","","SURR","85","","-99","LOQ","YES","40.3","","247.9","1.00","0",""
"WGNA-110217-FRB-3882","537","RES","320-33018-16","TALSAC","STL00996","13C2
PFDA","35","ng/L","","-99","DL","","SURR","86","","-99","LOQ","YES","40.3","","247.9","1.00","0",""
"NAWC-110217-FRB-286","537","RES","320-33018-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","7.0","DL","","TRG","","","41","LOQ","YES","-99","","243.9","1.00","16",""
"NAWC-110217-FRB-286","537","RES","320-33018-2","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","8.2","ng/L","U","2.9","DL","","TRG","","","21","LOQ","YES","-99","","243.9","1.00","8.2",""
"NAWC-110217-FRB-286","537","RES","320-33018-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.6","DL","","TRG","","","31","LOQ","YES","-99","","243.9","1.00","12",""
"NAWC-110217-FRB-286","537","RES","320-33018-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","37","ng/L","U","17","DL","","TRG","","","92","LOQ","YES","-99","","243.9","1.00","37",""
"NAWC-110217-FRB-286","537","RES","320-33018-2","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.1","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","243.9","1.00","4.1",""
"NAWC-110217-FRB-286","537","RES","320-33018-2","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","21","ng/L","U","8.2","DL","","TRG","","","25","LOQ","YES","-99","","243.9","1.00","21",""
"NAWC-110217-FRB-286","537","RES","320-33018-2","TALSAC","STL00993","13C2
PFHxA","34","ng/L","","-99","DL","","SURR","84","","-99","LOQ","YES","41.0","","243.9","1.00","0",""
"NAWC-110217-FRB-286","537","RES","320-33018-2","TALSAC","STL00996","13C2
PFDA","35","ng/L","","-99","DL","","SURR","85","","-99","LOQ","YES","41.0","","243.9","1.00","0",""
"WGNA-110217-RW-3978","537","RES","320-33018-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","22","ng/L","J M","6.9","DL","","TRG","","","41","LOQ","YES","-99","","245.7","1.00","16",""
"WGNA-110217-RW-3978","537","RES","320-33018-3","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","14","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","245.7","1.00","8.1",""
"WGNA-110217-RW-3978","537","RES","320-33018-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","8.3","ng/L","J","5.6","DL","","TRG","","","31","LOQ","YES","-99","","245.7","1.00","12",""
"WGNA-110217-RW-3978","537","RES","320-33018-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","37","ng/L","U","16","DL","","TRG","","","92","LOQ","YES","-99","","245.7","1.00","37",""
"WGNA-110217-RW-3978","537","RES","320-33018-3","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","6.5","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","245.7","1.00","4.1",""
"WGNA-110217-RW-3978","537","RES","320-33018-3","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U M","8.1","DL","","TRG","","","24","LOQ","YES","-99","","245.7","1.00","20",""
"WGNA-110217-RW-3978","537","RES","320-33018-3","TALSAC","STL00993","13C2
PFHxA","32","ng/L","","-99","DL","","SURR","78","","-99","LOQ","YES","40.7","","245.7","1.00","0",""
"WGNA-110217-RW-3978","537","RES","320-33018-3","TALSAC","STL00996","13C2
PFDA","35","ng/L","","-99","DL","","SURR","85","","-99","LOQ","YES","40.7","","245.7","1.00","0",""
"WGNA-110217-FRB-3978","537","RES","320-33018-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid

(PFOS)","16","ng/L","U","6.9","DL","","TRG","","","40","LOQ","YES","-99","","247.4","1.00","16",""
"WGNA-110217-FRB-3978","537","RES","320-33018-4","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","8.1","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","247.4","1.00","8.1",""
"WGNA-110217-FRB-3978","537","RES","320-33018-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.6","DL","","TRG","","","30","LOQ","YES","-99","","247.4","1.00","12",""
"WGNA-110217-FRB-3978","537","RES","320-33018-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","91","LOQ","YES","-99","","247.4","1.00","36",""
"WGNA-110217-FRB-3978","537","RES","320-33018-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","247.4","1.00","4.0",""
"WGNA-110217-FRB-3978","537","RES","320-33018-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.1","DL","","TRG","","","24","LOQ","YES","-99","","247.4","1.00","20",""
"WGNA-110217-FRB-3978","537","RES","320-33018-4","TALSAC","STL00993","13C2
PFHxA","33","ng/L","","-99","DL","","SURR","82","","-99","LOQ","YES","40.4","","247.4","1.00","0",""
"WGNA-110217-FRB-3978","537","RES","320-33018-4","TALSAC","STL00996","13C2
PFDA","36","ng/L","","-99","DL","","SURR","88","","-99","LOQ","YES","40.4","","247.4","1.00","0",""
"NAWC-110217-RW-177-IRR","537","RES","320-33018-5","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","41","ng/L","M","7.0","DL","","TRG","","","41","LOQ","YES","-99","","243.1","1.00","16",""
"NAWC-110217-RW-177-IRR","537","RES","320-33018-5","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","16","ng/L","J","2.9","DL","","TRG","","","21","LOQ","YES","-99","","243.1","1.00","8.2",""
"NAWC-110217-RW-177-IRR","537","RES","320-33018-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","29","ng/L","J","5.7","DL","","TRG","","","31","LOQ","YES","-99","","243.1","1.00","12",""
"NAWC-110217-RW-177-IRR","537","RES","320-33018-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","37","ng/L","U","17","DL","","TRG","","","93","LOQ","YES","-99","","243.1","1.00","37",""
"NAWC-110217-RW-177-IRR","537","RES","320-33018-5","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","6.0","ng/L","J M","2.0","DL","","TRG","","","10","LOQ","YES","-99","","243.1","1.00","4.1",""
"NAWC-110217-RW-177-IRR","537","RES","320-33018-5","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","21","ng/L","U M","8.2","DL","","TRG","","","25","LOQ","YES","-99","","243.1","1.00","21",""
"NAWC-110217-RW-177-IRR","537","RES","320-33018-5","TALSAC","STL00993","13C2
PFHxA","25","ng/L","Q","-99","DL","","SURR","60","","-99","LOQ","YES","41.1","","243.1","1.00","0",""
"NAWC-110217-RW-177-IRR","537","RES","320-33018-5","TALSAC","STL00996","13C2
PFDA","36","ng/L","","-99","DL","","SURR","88","","-99","LOQ","YES","41.1","","243.1","1.00","0",""
"NAWC-110217-FRB-177-IRR","537","RES","320-33018-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.9","DL","","TRG","","","41","LOQ","YES","-99","","246.3","1.00","16",""
"NAWC-110217-FRB-177-IRR","537","RES","320-33018-6","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","8.1","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","246.3","1.00","8.1",""
"NAWC-110217-FRB-177-IRR","537","RES","320-33018-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.6","DL","","TRG","","","30","LOQ","YES","-99","","246.3","1.00","12",""
"NAWC-110217-FRB-177-IRR","537","RES","320-33018-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","37","ng/L","U","16","DL","","TRG","","","91","LOQ","YES","-99","","246.3","1.00","37",""
"NAWC-110217-FRB-177-IRR","537","RES","320-33018-6","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.1","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","246.3","1.00","4.1",""
"NAWC-110217-FRB-177-IRR","537","RES","320-33018-6","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.1","DL","","TRG","","","24","LOQ","YES","-99","","246.3","1.00","20",""
"NAWC-110217-FRB-177-IRR","537","RES","320-33018-6","TALSAC","STL00993","13C2
PFHxA","35","ng/L","","-99","DL","","SURR","87","","-99","LOQ","YES","40.6","","246.3","1.00","0",""
"NAWC-110217-FRB-177-IRR","537","RES","320-33018-6","TALSAC","STL00996","13C2
PFDA","36","ng/L","","-99","DL","","SURR","89","","-99","LOQ","YES","40.6","","246.3","1.00","0",""
"NAWC-110217-RW-177-SHOP","537","RES","320-33018-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","21","ng/L","J","7.0","DL","","TRG","","","41","LOQ","YES","-99","","243.8","1.00","16",""
"NAWC-110217-RW-177-SHOP","537","RES","320-33018-7","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","12","ng/L","J","2.9","DL","","TRG","","","21","LOQ","YES","-99","","243.8","1.00","8.2",""
"NAWC-110217-RW-177-SHOP","537","RES","320-33018-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","14","ng/L","J","5.6","DL","","TRG","","","31","LOQ","YES","-99","","243.8","1.00","12",""
"NAWC-110217-RW-177-SHOP","537","RES","320-33018-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid

(PFBS)","37","ng/L","U","17","DL","","TRG","","","92","LOQ","YES","-99","","243.8","1.00","37",""
"NAWC-110217-RW-177-SHOP","537","RES","320-33018-7","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.1","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","243.8","1.00","4.1",""
"NAWC-110217-RW-177-SHOP","537","RES","320-33018-7","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","21","ng/L","U M","8.2","DL","","TRG","","","25","LOQ","YES","-99","","243.8","1.00","21",""
"NAWC-110217-RW-177-SHOP","537","RES","320-33018-7","TALSAC","STL00993","13C2
PFHxA","20","ng/L","Q","-99","DL","","SURR","48","","-99","LOQ","YES","41.0","","243.8","1.00","0",""
"NAWC-110217-RW-177-SHOP","537","RES","320-33018-7","TALSAC","STL00996","13C2
PFDA","34","ng/L","","-99","DL","","SURR","84","","-99","LOQ","YES","41.0","","243.8","1.00","0",""
"NAWC-110217-FRB-177-SHOP","537","RES","320-33018-8","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","251.1","1.00","16",""
"NAWC-110217-FRB-177-SHOP","537","RES","320-33018-8","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","251.1","1.00","8.0",""
"NAWC-110217-FRB-177-SHOP","537","RES","320-33018-8","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","251.1","1.00","12",""
"NAWC-110217-FRB-177-SHOP","537","RES","320-33018-8","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","251.1","1.00","36",""
"NAWC-110217-FRB-177-SHOP","537","RES","320-33018-8","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","251.1","1.00","4.0",""
"NAWC-110217-FRB-177-SHOP","537","RES","320-33018-8","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","251.1","1.00","20",""
"NAWC-110217-FRB-177-SHOP","537","RES","320-33018-8","TALSAC","STL00993","13C2
PFHxA","33","ng/L","","-99","DL","","SURR","84","","-99","LOQ","YES","39.8","","251.1","1.00","0",""
"NAWC-110217-FRB-177-SHOP","537","RES","320-33018-8","TALSAC","STL00996","13C2
PFDA","35","ng/L","","-99","DL","","SURR","87","","-99","LOQ","YES","39.8","","251.1","1.00","0",""
"NAWC-110217-RW-185","537","RES","320-33018-9","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","19","ng/L","J","6.8","DL","","TRG","","","40","LOQ","YES","-99","","249.1","1.00","16",""
"NAWC-110217-RW-185","537","RES","320-33018-9","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","14","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","249.1","1.00","8.0",""
"NAWC-110217-RW-185","537","RES","320-33018-9","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","10","ng/L","J","5.5","DL","","TRG","","","30","LOQ","YES","-99","","249.1","1.00","12",""
"NAWC-110217-RW-185","537","RES","320-33018-9","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","249.1","1.00","36",""
"NAWC-110217-RW-185","537","RES","320-33018-9","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","9.8","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","249.1","1.00","4.0",""
"NAWC-110217-RW-185","537","RES","320-33018-9","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U M","8.0","DL","","TRG","","","24","LOQ","YES","-99","","249.1","1.00","20",""
"NAWC-110217-RW-185","537","RES","320-33018-9","TALSAC","STL00993","13C2
PFHxA","31","ng/L","","-99","DL","","SURR","77","","-99","LOQ","YES","40.1","","249.1","1.00","0",""
"NAWC-110217-RW-185","537","RES","320-33018-9","TALSAC","STL00996","13C2
PFDA","33","ng/L","","-99","DL","","SURR","82","","-99","LOQ","YES","40.1","","249.1","1.00","0",""
"LCS 320-193512/2-A","537","RES","LCS 320-193512/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","210","ng/L","M","6.8","DL","","SPK","95","","40","LOQ","YES","222","","250.00","1.00","16",""
"LCS 320-193512/2-A","537","RES","LCS 320-193512/2-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","105","ng/L","","2.8","DL","","SPK","94","","20","LOQ","YES","111","","250.00","1.00","8.0",""
"LCS 320-193512/2-A","537","RES","LCS 320-193512/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","165","ng/L","","5.5","DL","","SPK","99","","30","LOQ","YES","167","","250.00","1.00","12",""
"LCS 320-193512/2-A","537","RES","LCS 320-193512/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","473","ng/L","","16","DL","","SPK","95","","90","LOQ","YES","500","","250.00","1.00","36",""
"LCS 320-193512/2-A","537","RES","LCS 320-193512/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","51.7","ng/L","","1.9","DL","","SPK","93","","10","LOQ","YES","55.6","","250.00","1.00","4.0",""
"LCS 320-193512/2-A","537","RES","LCS 320-193512/2-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","103","ng/L","","8.0","DL","","SPK","93","","24","LOQ","YES","111","","250.00","1.00","20",""
"LCS 320-193512/2-A","537","RES","LCS 320-193512/2-A","TALSAC","STL00993","13C2

PFHxA","35.5","ng/L","","-99","DL","","SURR","89","","-99","LOQ","YES","40.0","","250.00","1.00","0",""
"LCS 320-193512/2-A","537","RES","LCS 320-193512/2-A","TALSAC","STL00996","13C2
PFDA","34.8","ng/L","","-99","DL","","SURR","87","","-99","LOQ","YES","40.0","","250.00","1.00","0",""
"LCSD 320-193512/3-A","537","RES","LCSD 320-193512/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic
acid (PFOS)","215","ng/L","M","6.8","DL","","SPK","97","2","40","LOQ","YES","222","LCS 320-193512/2-
A","250.00","1.00","16",""
"LCSD 320-193512/3-A","537","RES","LCSD 320-193512/3-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","103","ng/L","","2.8","DL","","SPK","93","2","20","LOQ","YES","111","LCS 320-193512/2-
A","250.00","1.00","8.0",""
"LCSD 320-193512/3-A","537","RES","LCSD 320-193512/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic
acid (PFHxS)","169","ng/L","","5.5","DL","","SPK","102","3","30","LOQ","YES","167","LCS 320-193512/2-
A","250.00","1.00","12",""
"LCSD 320-193512/3-A","537","RES","LCSD 320-193512/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","480","ng/L","","16","DL","","SPK","96","1","90","LOQ","YES","500","LCS 320-193512/2-
A","250.00","1.00","36",""
"LCSD 320-193512/3-A","537","RES","LCSD 320-193512/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","52.2","ng/L","","1.9","DL","","SPK","94","1","10","LOQ","YES","55.6","LCS 320-193512/2-
A","250.00","1.00","4.0",""
"LCSD 320-193512/3-A","537","RES","LCSD 320-193512/3-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","106","ng/L","","8.0","DL","","SPK","95","2","24","LOQ","YES","111","LCS 320-193512/2-
A","250.00","1.00","20",""
"LCSD 320-193512/3-A","537","RES","LCSD 320-193512/3-A","TALSAC","STL00993","13C2
PFHxA","34.6","ng/L","","-99","DL","","SURR","87","","-99","LOQ","YES","40.0","LCS 320-193512/2-
A","250.00","1.00","0",""
"LCSD 320-193512/3-A","537","RES","LCSD 320-193512/3-A","TALSAC","STL00996","13C2
PFDA","34.6","ng/L","","-99","DL","","SURR","87","","-99","LOQ","YES","40.0","LCS 320-193512/2-
A","250.00","1.00","0",""
"MB 320-193512/1-A","537","RES","MB 320-193512/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250.00","1.00","16",""
"MB 320-193512/1-A","537","RES","MB 320-193512/1-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250.00","1.00","8.0",""
"MB 320-193512/1-A","537","RES","MB 320-193512/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250.00","1.00","12",""
"MB 320-193512/1-A","537","RES","MB 320-193512/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250.00","1.00","36",""
"MB 320-193512/1-A","537","RES","MB 320-193512/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250.00","1.00","4.0",""
"MB 320-193512/1-A","537","RES","MB 320-193512/1-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250.00","1.00","20",""
"MB 320-193512/1-A","537","RES","MB 320-193512/1-A","TALSAC","STL00993","13C2
PFHxA","34.2","ng/L","","-99","DL","","SURR","85","","-99","LOQ","YES","40.0","","250.00","1.00","0",""
"MB 320-193512/1-A","537","RES","MB 320-193512/1-A","TALSAC","STL00996","13C2
PFDA","36.4","ng/L","","-99","DL","","SURR","91","","-99","LOQ","YES","40.0","","250.00","1.00","0",""
"Unknown","Unknown","NAWC-110217-RW-286","11/02/2017 08:10","AQ","320-33018-
1","NM","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017
03:05","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194241","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""
"Unknown","Unknown","NAWC-110217-FRB-185","11/02/2017 10:05","AQ","320-33018-
10","FB","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017
03:56","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194251","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""
"Unknown","Unknown","NAWC-110217-RW-355","11/02/2017 10:40","AQ","320-33018-
11","NM","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017
04:01","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-

194251","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""
"Unknown","Unknown","NAWC-110217-FRB-355","11/02/2017 10:35","AQ","320-33018-
12","FB","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017
04:06","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194251","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""
"Unknown","Unknown","NAWC-110217-RW-348","11/02/2017 11:40","AQ","320-33018-
13","NM","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017
04:10","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194251","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""
"Unknown","Unknown","NAWC-110217-FRB-348","11/02/2017 11:35","AQ","320-33018-
14","FB","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017
04:15","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194251","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""
"Unknown","Unknown","WGNA-110217-RW-3882","11/02/2017 15:40","AQ","320-33018-
15","NM","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017
04:20","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194251","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""
"Unknown","Unknown","WGNA-110217-FRB-3882","11/02/2017 15:35","AQ","320-33018-
16","FB","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017
04:24","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194251","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""
"Unknown","Unknown","NAWC-110217-FRB-286","11/02/2017 08:05","AQ","320-33018-
2","FB","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017
03:09","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194241","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""
"Unknown","Unknown","WGNA-110217-RW-3978","11/02/2017 08:40","AQ","320-33018-
3","NM","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017
03:14","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194241","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""
"Unknown","Unknown","WGNA-110217-FRB-3978","11/02/2017 08:35","AQ","320-33018-
4","FB","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017
03:19","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194241","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""
"Unknown","Unknown","NAWC-110217-RW-177-IRR","11/02/2017 09:10","AQ","320-33018-
5","NM","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017
03:24","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194241","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""
"Unknown","Unknown","NAWC-110217-FRB-177-IRR","11/02/2017 09:05","AQ","320-33018-
6","FB","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017
03:28","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194241","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""
"Unknown","Unknown","NAWC-110217-RW-177-SHOP","11/02/2017 09:20","AQ","320-33018-
7","NM","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017
03:33","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194241","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""
"Unknown","Unknown","NAWC-110217-FRB-177-SHOP","11/02/2017 09:15","AQ","320-33018-
8","FB","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017
03:47","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194251","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""
"Unknown","Unknown","NAWC-110217-RW-185","11/02/2017 10:10","AQ","320-33018-
9","NM","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017
03:52","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194251","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""
"Unknown","Unknown","LCS 320-193512/2-A","","AQ","LCS 320-193512/2-

A","LCS","","-99","537","METHOD","RES","11/08/2017 11:47","11/13/2017
02:55","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194241","320-33018-1","11/08/2017 11:47","11/20/2017 13:54",""
"Unknown","Unknown","LCSD 320-193512/3-A","","AQ","LCSD 320-193512/3-
A","LCSD","","-99","537","METHOD","RES","11/08/2017 11:47","11/13/2017
03:00","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194241","320-33018-1","11/08/2017 11:47","11/20/2017 13:54",""
"Unknown","Unknown","MB 320-193512/1-A","","AQ","MB 320-193512/1-
A","MB","","-99","537","METHOD","RES","11/08/2017 11:47","11/13/2017
02:51","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-
194241","320-33018-1","11/08/2017 11:47","11/20/2017 13:54",""

TETRA TECH

INTERNAL CORRESPONDENCE

TO: **A. FREBOWITZ** **DATE:** **NOVEMBER 30, 2017**

FROM: **TERRI L. SOLOMON** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)**
NAS JRB WILLOW GROVE
SAMPLE DELIVERY GROUP (SDG) 320-33018-1

SAMPLES: 8/Field Reagent Blank (FRB)

NAWC-110217-FRB-177-IRR	NAWC-110217-FRB-177-SHOP
NAWC-110217-FRB-185	NAWC-110217-FRB-286
NAWC-110217-FRB-348	NAWC-110217-FRB-355
WGNA-110217-FRB-3882	WGNA-110217-FRB-3978

8/Drinking Water

NAWC-110217-RW-177-IRR	NAWC-110217-RW-177-SHOP
NAWC-110217-RW-185	NAWC-110217-RW-286
NAWC-110217-RW-348	NAWC-110217-RW-355
WGNA-110217-RW-3882	WGNA-110217-RW-3978

Overview

The sample set for NAS JRB Willow Grove, SDG 320-33018-1, consisted of eight (8) drinking water samples and eight (8) FRB samples. All samples were analyzed for select perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA) and perfluorooctane sulfonic acid (PFOS). No field duplicate sample pairs were included in this SDG.

The samples were collected by Tetra Tech on November 2, 2017 and analyzed by Test America-Sacramento. All sample analyses were conducted in accordance with EPA Method 537 version 1.1 analytical and reporting protocols.

The data contained in this SDG was validated with regard to the following parameters: data completeness, holding times, initial/continuing calibrations, laboratory method/FRBs, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate results, internal standard areas and recoveries, chromatographic resolution, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

Major

None.

Minor

The following surrogate recoveries were below the 70% quality control limit. The samples were reanalyzed by the laboratory with similar recoveries and the original analyses were reported. The detected and nondetected results reported in the affected samples were qualified as estimated (J) and (UJ), respectively.

Sample	Surrogate
NAWC-110217-RW-177-IRR	13C2 Perfluorohexanoic acid
NAWC-110217-RW-177-SHOP	13C2 Perfluorohexanoic acid

Detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated, (J).

Notes

It was noted by the laboratory that sample container label (NAWC-110217-FRB-IRR) did not match the chain of custody sample ID (NAWC-110217-FRB-177-IRR). The chain of custody sample ID was used by the laboratory.

Samples with detections and their associated FRBs are summarized below. No detected results were present in the FRBs.

Sample	**Associated FRB**
NAWC-110217-RW-177-IRR	NAWC-110217-FRB-177-IRR
NAWC-110217-RW-177-SHOP	NAWC-110217-FRB-177-SHOP
NAWC-110217-RW-185	NAWC-110217-FRB-185
NAWC-110217-RW-286	NAWC-110217-FRB-286
NAWC-110217-RW-348	NAWC-110217-FRB-348
NAWC-110217-RW-355	NAWC-110217-FRB-355
WGNA-110217-RW-3882	WGNA-110217-FRB-3882
WGNA-110217-RW-3978	WGNA-110217-FRB-3978

Non-detected results were reported to the Limit of Detection (LOD).

The buffering agent Trizma was added to all drinking water samples.

Executive Summary

Laboratory Performance: Two surrogate recoveries were below the quality control limit.

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

The data for these analyses were reviewed with reference to the Environmental Protection Agency document EPA/600/R-08/092, Method 537, “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”, (September 2009) and the US EPA National Functional Guidelines for Organic Data Review (January 2017) as applicable. The text of this report has been formulated to address only those areas affecting data quality.

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

Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04	NSAMPLE	NAWC-110217-FRB-177-IRR			NAWC-110217-FRB-177-SHOP			NAWC-110217-FRB-185			NAWC-110217-FRB-286		
SDG: 320-33018-1	LAB_ID	320-33018-6			320-33018-8			320-33018-10			320-33018-2		
FRACTION: PFAS	SAMP_DATE	11/2/2017			11/2/2017			11/2/2017			11/2/2017		
MEDIA: WATER	QC_TYPE	FB			FB			FB			FB		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		8.1	U		8	U		8	U		8.2	U	
PERFLUOROBUTANESULFONIC ACID		37	U		36	U		36	U		37	U	
PERFLUOROHEPTANOIC ACID		4.1	U		4	U		4	U		4.1	U	
PERFLUOROHEXANESULFONIC ACID		12	U		12	U		12	U		12	U	
PERFLUORONONANOIC ACID		20	U		20	U		20	U		21	U	
PERFLUOROOCTANE SULFONIC ACID		16	U		16	U		16	U		16	U	

PROJ_NO: 08005-WE04	NSAMPLE	NAWC-110217-FRB-348			NAWC-110217-FRB-355			NAWC-110217-RW-177-IRR			NAWC-110217-RW-177-SHOP		
SDG: 320-33018-1	LAB_ID	320-33018-14			320-33018-12			320-33018-5			320-33018-7		
FRACTION: PFAS	SAMP_DATE	11/2/2017			11/2/2017			11/2/2017			11/2/2017		
MEDIA: WATER	QC_TYPE	FB			FB			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		7.9	U		8.2	U		16	J	PR	12	J	PR
PERFLUOROBUTANESULFONIC ACID		36	U		37	U		37	UJ	R	37	UJ	R
PERFLUOROHEPTANOIC ACID		4	U		4.1	U		6	J	PR	4.1	J	PR
PERFLUOROHEXANESULFONIC ACID		12	U		12	U		29	J	PR	14	J	PR
PERFLUORONONANOIC ACID		20	U		20	U		21	UJ	R	21	UJ	R
PERFLUOROOCTANE SULFONIC ACID		16	U		16	U		41	J	R	21	J	PR

PROJ_NO: 08005-WE04	NSAMPLE	NAWC-110217-RW-185			NAWC-110217-RW-286			NAWC-110217-RW-348			NAWC-110217-RW-355		
SDG: 320-33018-1	LAB_ID	320-33018-9			320-33018-1			320-33018-13			320-33018-11		
FRACTION: PFAS	SAMP_DATE	11/2/2017			11/2/2017			11/2/2017			11/2/2017		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		14	J	P	16	J	P	19	J	P	7.8	J	P
PERFLUOROBUTANESULFONIC ACID		36	U		37	U		36	U		36	U	
PERFLUOROHEPTANOIC ACID		9.8	J	P	3.9	J	P	4.7	J	P	2.3	J	P
PERFLUOROHEXANESULFONIC ACID		10	J	P	6.5	J	P	10	J	P	6.1	J	P
PERFLUORONONANOIC ACID		20	U		21	U		20	U		20	U	
PERFLUOROOCTANE SULFONIC ACID		19	J	P	21	J	P	33	J	P	9.2	J	P

PROJ_NO: 08005-WE04	NSAMPLE	WGNA-110217-FRB-3882			WGNA-110217-FRB-3978			WGNA-110217-RW-3882			WGNA-110217-RW-3978		
SDG: 320-33018-1	LAB_ID	320-33018-16			320-33018-4			320-33018-15			320-33018-3		
FRACTION: PFAS	SAMP_DATE	11/2/2017			11/2/2017			11/2/2017			11/2/2017		
MEDIA: WATER	QC_TYPE	FB			FB			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		8.1	U		8.1	U		7.1	J	P	14	J	P
PERFLUOROBUTANESULFONIC ACID		36	U		36	U		36	U		37	U	
PERFLUOROHEPTANOIC ACID		4	U		4	U		3.7	J	P	6.5	J	P
PERFLUOROHEXANESULFONIC ACID		12	U		12	U		8.2	J	P	8.3	J	P
PERFLUORONONANOIC ACID		20	U		20	U		20	U		20	U	
PERFLUOROOCTANE SULFONIC ACID		16	U		16	U		9	J	P	22	J	P

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-286 | Lab Sample ID: 320-33018-1

Matrix: Water | Lab File ID: 2017.11.13_537A_010.d

Analysis Method: 537 | Date Collected: 11/02/2017 08:10

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 242.3(mL) | Date Analyzed: 11/13/2017 03:05

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J ~~M~~	41	17	7.0
335-67-1	Perfluorooctanoic acid (PFOA)	16	J	21	8.3	2.9
375-95-1	Perfluorononanoic acid (PFNA)	21	U ~~M~~	25	21	8.3
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.5	J	31	12	5.7
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	J	10	4.1	2.0
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	93	37	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	84		70-130
STL00996	13C2 PFDA	79		70-130

11/30/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-286 | Lab Sample ID: 320-33018-2

Matrix: Water | Lab File ID: 2017.11.13_537A_011.d

Analysis Method: 537 | Date Collected: 11/02/2017 08:05

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 243.9(mL) | Date Analyzed: 11/13/2017 03:09

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	7.0
335-67-1	Perfluorooctanoic acid (PFOA)	8.2	U	21	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	21	U	25	21	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	84		70-130
STL00996	13C2 PFDA	85		70-130

11/30/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: WGNA-110217-RW-3978 | Lab Sample ID: 320-33018-3

Matrix: Water | Lab File ID: 2017.11.13_537A_012.d

Analysis Method: 537 | Date Collected: 11/02/2017 08:40

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 245.7(mL) | Date Analyzed: 11/13/2017 03:14

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	22	J ~~M~~	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	14	J	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U ~~M~~	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.3	J	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.5	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	78		70-130
STL00996	13C2 PFDA	85		70-130

11/30/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: WGNA-110217-FRB-3978 | Lab Sample ID: 320-33018-4

Matrix: Water | Lab File ID: 2017.11.13_537A_013.d

Analysis Method: 537 | Date Collected: 11/02/2017 08:35

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 247.4(mL) | Date Analyzed: 11/13/2017 03:19

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	82		70-130
STL00996	13C2 PFDA	88		70-130

11/30/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-177-IRR | Lab Sample ID: 320-33018-5

Matrix: Water | Lab File ID: 2017.11.13_537A_014.d

Analysis Method: 537 | Date Collected: 11/02/2017 09:10

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 243.1(mL) | Date Analyzed: 11/13/2017 03:24

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	41	~~M~~ J	41	16	7.0
335-67-1	Perfluorooctanoic acid (PFOA)	16	J	21	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	21	~~U M~~ UJ	25	21	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	29	J	31	12	5.7
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.0	J ~~M~~	10	4.1	2.0
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	~~U~~ UJ	93	37	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	60	Q	70-130
STL00996	13C2 PFDA	88		70-130

Toni L Salerno
11/30/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-177-IRR | Lab Sample ID: 320-33018-6

Matrix: Water | Lab File ID: 2017.11.13_537A_015.d

Analysis Method: 537 | Date Collected: 11/02/2017 09:05

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 246.3(mL) | Date Analyzed: 11/13/2017 03:28

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	91	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	89		70-130

11/30/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-177-SHOP | Lab Sample ID: 320-33018-7

Matrix: Water | Lab File ID: 2017.11.13_537A_016.d

Analysis Method: 537 | Date Collected: 11/02/2017 09:20

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 243.8(mL) | Date Analyzed: 11/13/2017 03:33

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J	41	16	7.0
335-67-1	Perfluorooctanoic acid (PFOA)	12	J	21	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	21	~~U M~~ UJ	25	21	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	14	J	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	~~U~~ UJ	92	37	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	48	Q	70-130
STL00996	13C2 PFDA	84		70-130

Toni L Salomon
11/30/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-177-SHOP | Lab Sample ID: 320-33018-8

Matrix: Water | Lab File ID: 2017.11.13_537A_019.d

Analysis Method: 537 | Date Collected: 11/02/2017 09:15

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 251.1(mL) | Date Analyzed: 11/13/2017 03:47

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	84		70-130
STL00996	13C2 PFDA	87		70-130

11/30/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-185 | Lab Sample ID: 320-33018-9

Matrix: Water | Lab File ID: 2017.11.13_537A_020.d

Analysis Method: 537 | Date Collected: 11/02/2017 10:10

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 249.1(mL) | Date Analyzed: 11/13/2017 03:52

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	14	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U ~~M~~	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	9.8	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	77		70-130
STL00996	13C2 PFDA	82		70-130

Dawn L Salerno
11/30/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-185 | Lab Sample ID: 320-33018-10

Matrix: Water | Lab File ID: 2017.11.13_537A_021.d

Analysis Method: 537 | Date Collected: 11/02/2017 10:05

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 250.6(mL) | Date Analyzed: 11/13/2017 03:56

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	88		70-130

11/30/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-355 | Lab Sample ID: 320-33018-11

Matrix: Water | Lab File ID: 2017.11.13_537A_022.d

Analysis Method: 537 | Date Collected: 11/02/2017 10:40

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 249.3(mL) | Date Analyzed: 11/13/2017 04:01

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.2	J	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	7.8	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U ~~M~~	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.1	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.3	J ~~M~~	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	77		70-130
STL00996	13C2 PFDA	82		70-130

Toni L Salomon
11/30/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-355 | Lab Sample ID: 320-33018-12

Matrix: Water | Lab File ID: 2017.11.13_537A_023.d

Analysis Method: 537 | Date Collected: 11/02/2017 10:35

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 245.2(mL) | Date Analyzed: 11/13/2017 04:06

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.2	U	20	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	89		70-130
STL00996	13C2 PFDA	82		70-130

11/30/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-348 | Lab Sample ID: 320-33018-13

Matrix: Water | Lab File ID: 2017.11.13_537A_024.d

Analysis Method: 537 | Date Collected: 11/02/2017 11:40

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 250.3(mL) | Date Analyzed: 11/13/2017 04:10

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	33	J	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	19	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U ~~M~~	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.7	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	82		70-130
STL00996	13C2 PFDA	83		70-130

Toni L Salomon
11/30/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-348 | Lab Sample ID: 320-33018-14

Matrix: Water | Lab File ID: 2017.11.13_537A_025.d

Analysis Method: 537 | Date Collected: 11/02/2017 11:35

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 252.5(mL) | Date Analyzed: 11/13/2017 04:15

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	88		70-130

11/30/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: WGNA-110217-RW-3882 | Lab Sample ID: 320-33018-15

Matrix: Water | Lab File ID: 2017.11.13_537A_026.d

Analysis Method: 537 | Date Collected: 11/02/2017 15:40

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 250.9(mL) | Date Analyzed: 11/13/2017 04:20

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.0	J	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	7.1	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U ~~M~~	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.2	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.7	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	83		70-130
STL00996	13C2 PFDA	84		70-130

Terri L Salomon
11/30/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: WGNA-110217-FRB-3882 | Lab Sample ID: 320-33018-16

Matrix: Water | Lab File ID: 2017.11.13_537A_027.d

Analysis Method: 537 | Date Collected: 11/02/2017 15:35

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 247.9(mL) | Date Analyzed: 11/13/2017 04:24

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	85		70-130
STL00996	13C2 PFDA	86		70-130

11/30/2017

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-286 | Lab Sample ID: 320-33018-1

Matrix: Water | Lab File ID: 2017.11.13_537A_010.d

Analysis Method: 537 | Date Collected: 11/02/2017 08:10

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 242.3(mL) | Date Analyzed: 11/13/2017 03:05

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J M	41	17	7.0
335-67-1	Perfluorooctanoic acid (PFOA)	16	J	21	8.3	2.9
375-95-1	Perfluorononanoic acid (PFNA)	21	U M	25	21	8.3
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.5	J	31	12	5.7
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	J	10	4.1	2.0
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	93	37	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	84		70-130
STL00996	13C2 PFDA	79		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-286 | Lab Sample ID: 320-33018-2

Matrix: Water | Lab File ID: 2017.11.13_537A_011.d

Analysis Method: 537 | Date Collected: 11/02/2017 08:05

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 243.9(mL) | Date Analyzed: 11/13/2017 03:09

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	7.0
335-67-1	Perfluorooctanoic acid (PFOA)	8.2	U	21	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	21	U	25	21	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	84		70-130
STL00996	13C2 PFDA	85		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: WGNA-110217-RW-3978 | Lab Sample ID: 320-33018-3

Matrix: Water | Lab File ID: 2017.11.13_537A_012.d

Analysis Method: 537 | Date Collected: 11/02/2017 08:40

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 245.7(mL) | Date Analyzed: 11/13/2017 03:14

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	22	J M	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	14	J	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.3	J	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.5	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	78		70-130
STL00996	13C2 PFDA	85		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: WGNA-110217-FRB-3978 | Lab Sample ID: 320-33018-4

Matrix: Water | Lab File ID: 2017.11.13_537A_013.d

Analysis Method: 537 | Date Collected: 11/02/2017 08:35

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 247.4(mL) | Date Analyzed: 11/13/2017 03:19

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	82		70-130
STL00996	13C2 PFDA	88		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-177-IRR Lab Sample ID: 320-33018-5

Matrix: Water Lab File ID: 2017.11.13_537A_014.d

Analysis Method: 537 Date Collected: 11/02/2017 09:10

Extraction Method: 537 Date Extracted: 11/08/2017 11:47

Sample wt/vol: 243.1(mL) Date Analyzed: 11/13/2017 03:24

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	41	M	41	16	7.0
335-67-1	Perfluorooctanoic acid (PFOA)	16	J	21	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	21	U M	25	21	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	29	J	31	12	5.7
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.0	J M	10	4.1	2.0
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	93	37	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	60	Q	70-130
STL00996	13C2 PFDA	88		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-177-IRR Lab Sample ID: 320-33018-6

Matrix: Water Lab File ID: 2017.11.13_537A_015.d

Analysis Method: 537 Date Collected: 11/02/2017 09:05

Extraction Method: 537 Date Extracted: 11/08/2017 11:47

Sample wt/vol: 246.3(mL) Date Analyzed: 11/13/2017 03:28

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	91	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	89		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-177-SHOP Lab Sample ID: 320-33018-7

Matrix: Water Lab File ID: 2017.11.13_537A_016.d

Analysis Method: 537 Date Collected: 11/02/2017 09:20

Extraction Method: 537 Date Extracted: 11/08/2017 11:47

Sample wt/vol: 243.8(mL) Date Analyzed: 11/13/2017 03:33

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J	41	16	7.0
335-67-1	Perfluorooctanoic acid (PFOA)	12	J	21	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	21	U M	25	21	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	14	J	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	48	Q	70-130
STL00996	13C2 PFDA	84		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-177-SHOP | Lab Sample ID: 320-33018-8

Matrix: Water | Lab File ID: 2017.11.13_537A_019.d

Analysis Method: 537 | Date Collected: 11/02/2017 09:15

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 251.1(mL) | Date Analyzed: 11/13/2017 03:47

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	84		70-130
STL00996	13C2 PFDA	87		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-185 | Lab Sample ID: 320-33018-9

Matrix: Water | Lab File ID: 2017.11.13_537A_020.d

Analysis Method: 537 | Date Collected: 11/02/2017 10:10

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 249.1(mL) | Date Analyzed: 11/13/2017 03:52

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	14	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	9.8	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	77		70-130
STL00996	13C2 PFDA	82		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-185 | Lab Sample ID: 320-33018-10

Matrix: Water | Lab File ID: 2017.11.13_537A_021.d

Analysis Method: 537 | Date Collected: 11/02/2017 10:05

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 250.6(mL) | Date Analyzed: 11/13/2017 03:56

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	88		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-355 | Lab Sample ID: 320-33018-11

Matrix: Water | Lab File ID: 2017.11.13_537A_022.d

Analysis Method: 537 | Date Collected: 11/02/2017 10:40

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 249.3(mL) | Date Analyzed: 11/13/2017 04:01

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.2	J	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	7.8	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.1	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.3	J M	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	77		70-130
STL00996	13C2 PFDA	82		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-355 | Lab Sample ID: 320-33018-12

Matrix: Water | Lab File ID: 2017.11.13_537A_023.d

Analysis Method: 537 | Date Collected: 11/02/2017 10:35

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 245.2(mL) | Date Analyzed: 11/13/2017 04:06

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.2	U	20	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	89		70-130
STL00996	13C2 PFDA	82		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-RW-348 | Lab Sample ID: 320-33018-13

Matrix: Water | Lab File ID: 2017.11.13_537A_024.d

Analysis Method: 537 | Date Collected: 11/02/2017 11:40

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 250.3(mL) | Date Analyzed: 11/13/2017 04:10

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	33	J	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	19	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.7	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	82		70-130
STL00996	13C2 PFDA	83		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: NAWC-110217-FRB-348 | Lab Sample ID: 320-33018-14

Matrix: Water | Lab File ID: 2017.11.13_537A_025.d

Analysis Method: 537 | Date Collected: 11/02/2017 11:35

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 252.5(mL) | Date Analyzed: 11/13/2017 04:15

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	88		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: WGNA-110217-RW-3882 | Lab Sample ID: 320-33018-15

Matrix: Water | Lab File ID: 2017.11.13_537A_026.d

Analysis Method: 537 | Date Collected: 11/02/2017 15:40

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 250.9(mL) | Date Analyzed: 11/13/2017 04:20

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.0	J	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	7.1	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.2	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.7	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	83		70-130
STL00996	13C2 PFDA	84		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: WGNA-110217-FRB-3882 | Lab Sample ID: 320-33018-16

Matrix: Water | Lab File ID: 2017.11.13_537A_027.d

Analysis Method: 537 | Date Collected: 11/02/2017 15:35

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 247.9(mL) | Date Analyzed: 11/13/2017 04:24

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194251 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	85		70-130
STL00996	13C2 PFDA	86		70-130

Appendix C

Support Documentation

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605-1500
phone 916.373.5600 fax 303.467.7248

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

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

Client Contact	Project Manager: Andy Frebowitz	Site Contact: Mary Kay Bond	Date: 11/2/2017	COC No:
TetraTech	Tel/Fax: 610.382.1170	Lab Contact: Dave Alltucker	Carrier: FedEx	1 of 1 COCs
234 Mall Boulevard Suite 260	Analysis Turnaround Time			Sampler: Mary Kay Bond
King of Prussia, PA 19406	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
610-382-1174	TAT if different from Below 21			Walk-in Client:
610-491-9688	☐ 2 weeks			Lab Sampling:
Project Name: WE04	☐ 1 week			
Site: WE04	☐ 2 days			Job / SDG No.:
P O # 1132358 (through EarthToxics)	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	EPA 537 UCMR3	Sample Specific Notes:
NAWC-110217-RW-286	11/2/2017	08:10	G	DW	2	N	N	Y	
NAWC-110217-FRB-286	11/2/2017	08:05	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-110217-RW-3978	11/2/2017	08:40	G	DW	2	N	N	Y	
WGNA-110217-FRB-3978	11/2/2017	08:35	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-110217-RW-177-IRR	11/2/2017	09:10	G	DW	2	N	N	Y	
NAWC-110217-FRB-177-IRR	11/2/2017	09:05	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-110217-RW-177-SHOP	11/2/2017	9:20	G	DW	2	N	N	Y	
NAWC-110217-FRB-177-SHOP	11/2/2017	9:15	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-110217-RW-185	11/2/2017	10:10	G	DW	2	N	N	Y	
NAWC-110217-FRB-185	11/2/2017	10:05	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-110217-RW-355	11/2/2017	10:40	G	DW	2	N	N	Y	
NAWC-110217-FRB-355	11/2/2017	10:35	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-110217-RW-348	11/2/2017	11:40	G	DW	2	N	N	Y	
NAWC-110217-FRB-348	11/2/2017	11:35	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-110217-RW-3882	11/2/2017	15:40	G	DW	2	N	N	Y	
WGNA-110217-FRB-3882	11/2/2017	15:35	G	DW	2	N	N	Y	Field Reagent Blank

* label NAWC-110217-FRB-IRR AA 11/04/17

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

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the

☑ 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

Fed Ex Tracking: 770649711525 (2 Coolers)

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 3.2 / 1.2 Corr'd: ✓ | Therm ID No.: AK-2

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Tetra Tech	11/2/2017 18:00	[signature]	TAws	11/03/17 900
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:		Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.11, dated 1/24/2017

320-33018 Chain of Custody

S:\WillowGrove PFOs Private Well\COCs TT\COC 20171102

Job Narrative
320-33018-1

Receipt
The samples were received on 11/3/2017 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.4º C and 3.2º C.

Receipt Exceptions
The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): NAWC-110217-FRB-177-IRR (320-33018-6). The container labels list NAWC-110217-FRB-IRR, while the COC listS NAWC-110217-FRB-177-IRR.

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

Method(s) 537: Surrogate recovery for the following samples was outside control limits: NAWC-110217-RW-177-IRR (320-33018-5) and NAWC-110217-RW-177-SHOP (320-33018-7). Re-analysis was performed with concurring results. The original analysis has been reported.

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

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

Method Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-33018-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

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: Tetra Tech, Inc. TestAmerica Job ID: 320-33018-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-33018-1	NAWC-110217-RW-286	Water	11/02/17 08:10	11/03/17 09:40
320-33018-2	NAWC-110217-FRB-286	Water	11/02/17 08:05	11/03/17 09:40
320-33018-3	WGNA-110217-RW-3978	Water	11/02/17 08:40	11/03/17 09:40
320-33018-4	WGNA-110217-FRB-3978	Water	11/02/17 08:35	11/03/17 09:40
320-33018-5	NAWC-110217-RW-177-IRR	Water	11/02/17 09:10	11/03/17 09:40
320-33018-6	NAWC-110217-FRB-177-IRR	Water	11/02/17 09:05	11/03/17 09:40
320-33018-7	NAWC-110217-RW-177-SHOP	Water	11/02/17 09:20	11/03/17 09:40
320-33018-8	NAWC-110217-FRB-177-SHOP	Water	11/02/17 09:15	11/03/17 09:40
320-33018-9	NAWC-110217-RW-185	Water	11/02/17 10:10	11/03/17 09:40
320-33018-10	NAWC-110217-FRB-185	Water	11/02/17 10:05	11/03/17 09:40
320-33018-11	NAWC-110217-RW-355	Water	11/02/17 10:40	11/03/17 09:40
320-33018-12	NAWC-110217-FRB-355	Water	11/02/17 10:35	11/03/17 09:40
320-33018-13	NAWC-110217-RW-348	Water	11/02/17 11:40	11/03/17 09:40
320-33018-14	NAWC-110217-FRB-348	Water	11/02/17 11:35	11/03/17 09:40
320-33018-15	WGNA-110217-RW-3882	Water	11/02/17 15:40	11/03/17 09:40
320-33018-16	WGNA-110217-FRB-3882	Water	11/02/17 15:35	11/03/17 09:40

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-110217-RW-286	320-33018-1	84	79
NAWC-110217-FRB-286	320-33018-2	84	85
WGNA-110217-RW-3978	320-33018-3	78	85
WGNA-110217-FRB-3978	320-33018-4	82	88
NAWC-110217-RW-177-IRR	320-33018-5	60 Q	88
NAWC-110217-FRB-177-IRR	320-33018-6	87	89
NAWC-110217-RW-177-SHOP	320-33018-7	48 Q	84
NAWC-110217-FRB-177-SHOP	320-33018-8	84	87
NAWC-110217-RW-185	320-33018-9	77	82
NAWC-110217-FRB-185	320-33018-10	87	88
NAWC-110217-RW-355	320-33018-11	77	82
NAWC-110217-FRB-355	320-33018-12	89	82
NAWC-110217-RW-348	320-33018-13	82	83
NAWC-110217-FRB-348	320-33018-14	90	88
WGNA-110217-RW-3882	320-33018-15	83	84
WGNA-110217-FRB-3882	320-33018-16	85	86
	MB 320-193512/1-A	85	91
	LCS 320-193512/2-A	89	87
	LCSD 320-193512/3-A	87	87

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

Column to be used to flag recovery values

FORM II 537

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.11.13_537A_008.d

Lab ID: LCS 320-193512/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	222	210	95	70-130	M
Perfluorooctanoic acid (PFOA)	111	105	94	70-130	
Perfluorononanoic acid (PFNA)	111	103	93	70-130	
Perfluorohexanesulfonic acid (PFHxS)	167	165	99	70-130	
Perfluoroheptanoic acid (PFHpA)	55.6	51.7	93	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	473	95	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.11.13_537A_009.d

Lab ID: LCSD 320-193512/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	222	215	97	2	30	70-130	M
Perfluorooctanoic acid (PFOA)	111	103	93	2	30	70-130	
Perfluorononanoic acid (PFNA)	111	106	95	2	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	167	169	102	3	30	70-130	
Perfluoroheptanoic acid (PFHpA)	55.6	52.2	94	1	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	480	96	1	30	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Lab File ID: 2017.11.13_537A_007.d Lab Sample ID: MB 320-193512/1-A

Matrix: Water Date Extracted: 11/08/2017 11:47

Instrument ID: A8_N Date Analyzed: 11/13/2017 02:51

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-193512/2-A	2017.11.13_537A_008.d	11/13/2017 02:55
	LCSD 320-193512/3-A	2017.11.13_537A_009.d	11/13/2017 03:00
NAWC-110217-RW-286	320-33018-1	2017.11.13_537A_010.d	11/13/2017 03:05
NAWC-110217-FRB-286	320-33018-2	2017.11.13_537A_011.d	11/13/2017 03:09
WGNA-110217-RW-3978	320-33018-3	2017.11.13_537A_012.d	11/13/2017 03:14
WGNA-110217-FRB-3978	320-33018-4	2017.11.13_537A_013.d	11/13/2017 03:19
NAWC-110217-RW-177-IRR	320-33018-5	2017.11.13_537A_014.d	11/13/2017 03:24
NAWC-110217-FRB-177-IRR	320-33018-6	2017.11.13_537A_015.d	11/13/2017 03:28
NAWC-110217-RW-177-SHOP	320-33018-7	2017.11.13_537A_016.d	11/13/2017 03:33
NAWC-110217-FRB-177-SHOP	320-33018-8	2017.11.13_537A_019.d	11/13/2017 03:47
NAWC-110217-RW-185	320-33018-9	2017.11.13_537A_020.d	11/13/2017 03:52
NAWC-110217-FRB-185	320-33018-10	2017.11.13_537A_021.d	11/13/2017 03:56
NAWC-110217-RW-355	320-33018-11	2017.11.13_537A_022.d	11/13/2017 04:01
NAWC-110217-FRB-355	320-33018-12	2017.11.13_537A_023.d	11/13/2017 04:06
NAWC-110217-RW-348	320-33018-13	2017.11.13_537A_024.d	11/13/2017 04:10
NAWC-110217-FRB-348	320-33018-14	2017.11.13_537A_025.d	11/13/2017 04:15
WGNA-110217-RW-3882	320-33018-15	2017.11.13_537A_026.d	11/13/2017 04:20
WGNA-110217-FRB-3882	320-33018-16	2017.11.13_537A_027.d	11/13/2017 04:24

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33018-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-193512/1-A

Matrix: Water | Lab File ID: 2017.11.13_537A_007.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 11/08/2017 11:47

Sample wt/vol: 250.00(mL) | Date Analyzed: 11/13/2017 02:51

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 194241 | Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	85		70-130
STL00996	13C2 PFDA	91		70-130

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Instrument ID: A8_N Calibration Start Date: 11/03/2017 13:37

GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 11/03/2017 14:01

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		1535518	1.91	3276559	2.15		
UPPER LIMIT		2303277	2.41	4914839	2.65		
LOWER LIMIT		767759	1.41	1638280	1.65		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-192908/11		1586829	1.91	3305852	2.15		
ICV 320-192908/13		1512045	1.90	3433628	2.14		
CCVL 320-194241/1		1563386	1.89	3212610	2.13		
CCV 320-194241/2 CCVIS		1499119	1.89	3081036	2.13		
MB 320-193512/1-A		1594024	1.90	3183489	2.13		
LCS 320-193512/2-A		1604626	1.89	3166909	2.12		
LCSD 320-193512/3-A		1626963	1.89	3122845	2.12		
320-33018-1	NAWC-110217-RW-286	1610416	1.89	3118882	2.12		
320-33018-2	NAWC-110217-FRB-286	1634964	1.90	3244030	2.13		
320-33018-3	WGNA-110217-RW-3978	1726982	1.89	3118921	2.12		
320-33018-4	WGNA-110217-FRB-3978	1720859	1.89	3245665	2.12		
320-33018-5	NAWC-110217-RW-177-IRR	1959199	1.88	4022877	2.12		
320-33018-6	NAWC-110217-FRB-177-IRR	1618805	1.88	3182899	2.12		
320-33018-7	NAWC-110217-RW-177-SHOP	1661894	1.88	3172392	2.12		
CCV 320-194241/14 CCVIS		1520572	1.89	3195765	2.12		
CCV 320-194251/14 CCVIS		1520572	1.89	3195765	2.12		
320-33018-8	NAWC-110217-FRB-177-SHOP	1645574	1.89	3338627	2.12		
320-33018-9	NAWC-110217-RW-185	1750127	1.88	3418133	2.12		
320-33018-10	NAWC-110217-FRB-185	1656481	1.88	3242885	2.12		
320-33018-11	NAWC-110217-RW-355	1745240	1.89	3289792	2.12		
320-33018-12	NAWC-110217-FRB-355	1590556	1.89	3142325	2.12		
320-33018-13	NAWC-110217-RW-348	1771725	1.88	3280139	2.12		
320-33018-14	NAWC-110217-FRB-348	1622165	1.89	3163206	2.12		
320-33018-15	WGNA-110217-RW-3882	1670566	1.88	3261923	2.12		
320-33018-16	WGNA-110217-FRB-3882	1680590	1.88	3129778	2.12		
CCV 320-194251/25 CCVIS		1546685	1.88	3175276	2.12		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Sample No.: CCV 320-194241/2 Date Analyzed: 11/13/2017 02:41

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2017.11.13_537A_005 Heated Purge: (Y/N) N

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1499119	1.89	3081036	2.13		
UPPER LIMIT		2098767	2.39	4313450	2.63		
LOWER LIMIT		1049383	1.39	2156725	1.63		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-193512/1-A		1594024	1.90	3183489	2.13		
LCS 320-193512/2-A		1604626	1.89	3166909	2.12		
LCSD 320-193512/3-A		1626963	1.89	3122845	2.12		
320-33018-1	NAWC-110217-RW-286	1610416	1.89	3118882	2.12		
320-33018-2	NAWC-110217-FRB-286	1634964	1.90	3244030	2.13		
320-33018-3	WGNA-110217-RW-3978	1726982	1.89	3118921	2.12		
320-33018-4	WGNA-110217-FRB-3978	1720859	1.89	3245665	2.12		
320-33018-5	NAWC-110217-RW-177-IRR	1959199	1.88	4022877	2.12		
320-33018-6	NAWC-110217-FRB-177-IRR	1618805	1.88	3182899	2.12		
320-33018-7	NAWC-110217-RW-177-SHOP	1661894	1.88	3172392	2.12		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Sample No.: CCV 320-194241/14 Date Analyzed: 11/13/2017 03:38

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2017.11.13_537A_017 Heated Purge: (Y/N) N

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1520572	1.89	3195765	2.12		
UPPER LIMIT		2128801	2.39	4474071	2.62		
LOWER LIMIT		1064400	1.39	2237036	1.62		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-193512/1-A		1594024	1.90	3183489	2.13		
LCS 320-193512/2-A		1604626	1.89	3166909	2.12		
LCSD 320-193512/3-A		1626963	1.89	3122845	2.12		
320-33018-1	NAWC-110217-RW-286	1610416	1.89	3118882	2.12		
320-33018-2	NAWC-110217-FRB-286	1634964	1.90	3244030	2.13		
320-33018-3	WGNA-110217-RW-3978	1726982	1.89	3118921	2.12		
320-33018-4	WGNA-110217-FRB-3978	1720859	1.89	3245665	2.12		
320-33018-5	NAWC-110217-RW-177-IRR	1959199	1.88	4022877	2.12		
320-33018-6	NAWC-110217-FRB-177-IRR	1618805	1.88	3182899	2.12		
320-33018-7	NAWC-110217-RW-177-SHOP	1661894	1.88	3172392	2.12		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Sample No.: CCV 320-194251/14 Date Analyzed: 11/13/2017 03:38

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2017.11.13_537A_017 Heated Purge: (Y/N) N

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1520572	1.89	3195765	2.12		
UPPER LIMIT		2128801	2.39	4474071	2.62		
LOWER LIMIT		1064400	1.39	2237036	1.62		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-33018-8	NAWC-110217-FRB-177-SHOP	1645574	1.89	3338627	2.12		
320-33018-9	NAWC-110217-RW-185	1750127	1.88	3418133	2.12		
320-33018-10	NAWC-110217-FRB-185	1656481	1.88	3242885	2.12		
320-33018-11	NAWC-110217-RW-355	1745240	1.89	3289792	2.12		
320-33018-12	NAWC-110217-FRB-355	1590556	1.89	3142325	2.12		
320-33018-13	NAWC-110217-RW-348	1771725	1.88	3280139	2.12		
320-33018-14	NAWC-110217-FRB-348	1622165	1.89	3163206	2.12		
320-33018-15	WGNA-110217-RW-3882	1670566	1.88	3261923	2.12		
320-33018-16	WGNA-110217-FRB-3882	1680590	1.88	3129778	2.12		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Sample No.: CCV 320-194251/25 Date Analyzed: 11/13/2017 04:29

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2017.11.13_537A_028 Heated Purge: (Y/N) N

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1546685	1.88	3175276	2.12		
UPPER LIMIT		2165359	2.38	4445386	2.62		
LOWER LIMIT		1082680	1.38	2222693	1.62		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-33018-8	NAWC-110217-FRB-177-SHOP	1645574	1.89	3338627	2.12		
320-33018-9	NAWC-110217-RW-185	1750127	1.88	3418133	2.12		
320-33018-10	NAWC-110217-FRB-185	1656481	1.88	3242885	2.12		
320-33018-11	NAWC-110217-RW-355	1745240	1.89	3289792	2.12		
320-33018-12	NAWC-110217-FRB-355	1590556	1.89	3142325	2.12		
320-33018-13	NAWC-110217-RW-348	1771725	1.88	3280139	2.12		
320-33018-14	NAWC-110217-FRB-348	1622165	1.89	3163206	2.12		
320-33018-15	WGNA-110217-RW-3882	1670566	1.88	3261923	2.12		
320-33018-16	WGNA-110217-FRB-3882	1680590	1.88	3129778	2.12		

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

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

Column used to flag values outside QC limits

FORM VIII 537

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

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1 Analy Batch No.: 192908

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192908/4	2017.11.03_537XICAL_004.d
Level 2	IC 320-192908/5	2017.11.03_537XICAL_005.d
Level 3	IC 320-192908/6	2017.11.03_537XICAL_006.d
Level 4	IC 320-192908/7	2017.11.03_537XICAL_007.d
Level 5	IC 320-192908/8	2017.11.03_537XICAL_008.d
Level 6	IC 320-192908/9	2017.11.03_537XICAL_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)	1.0397 0.8468	1.0767	1.0898	0.9577	0.9303	QuaF		1.1193	-0.001498						0.9990		0.9600
Perfluoroheptanoic acid (PFHpA)	0.9433 0.9848	0.9187	0.9551	0.9185	0.9011	Ave		0.9369				3.2		30.0			
Perfluorohexanesulfonic acid (PFHxS)	1.6459 1.6841	1.6355	1.7405	1.6631	1.6755	Ave		1.6741				2.2		30.0			
Perfluorooctanoic acid (PFOA)	0.9757 0.9799	0.8919	0.9000	0.8953	0.9117	Ave		0.9258				4.4		30.0			
Perfluorooctanesulfonic acid (PFOS)	0.8958 0.9902	0.9213	0.9281	0.9268	0.9715	Ave		0.9389				3.7		30.0			
Perfluorononanoic acid (PFNA)	0.6610 0.7042	0.6285	0.6624	0.6810	0.6478	Ave		0.6642				3.9		30.0			
13C2 PFHxA	1.0891 1.1664	1.0526	1.1042	1.1123	1.0772	Ave		1.1003				3.5		30.0			
13C2 PFDA	0.7748 0.8159	0.7295	0.7569	0.7811	0.7330	Ave		0.7652				4.3		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.: 320-33018-1 Analy Batch No.: 192908

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192908/4	2017.11.03_537XICAL_004.d
Level 2	IC 320-192908/5	2017.11.03_537XICAL_005.d
Level 3	IC 320-192908/6	2017.11.03_537XICAL_006.d
Level 4	IC 320-192908/7	2017.11.03_537XICAL_007.d
Level 5	IC 320-192908/8	2017.11.03_537XICAL_008.d
Level 6	IC 320-192908/9	2017.11.03_537XICAL_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	QuaF	1076553 16699152	2591121	5461974	10142530	14011858	9.00 180	20.0	45.0	90.0	135
Perfluoroheptanoic acid (PFHpA)	13PFOA	Ave	143455 2810797	331548	736034	1420703	2102676	1.00 20.0	2.22	5.00	10.0	15.0
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	568156 11071993	1312135	2908204	5871843	8413133	3.00 60.0	6.67	15.0	30.0	45.0
Perfluorooctanoic acid (PFOA)	13PFOA	Ave	296934 5597122	644149	1388033	2771271	4257225	2.00 40.0	4.45	10.0	20.0	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	412315 8679676	985487	2067792	4363079	6504279	4.00 80.0	8.89	20.0	40.0	60.0
Perfluorononanoic acid (PFNA)	13PFOA	Ave	201053 4019666	453612	1020851	2106479	3023088	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PFOA	Ave	1655691 1664260	1708988	1701491	1719911	1675220	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PFOA	Ave	1177922 1164156	1184358	1166275	1207887	1139992	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD
QuaF = Quadratic ISTD forced zero

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

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1 Analy Batch No.: 192908

SDG No.:

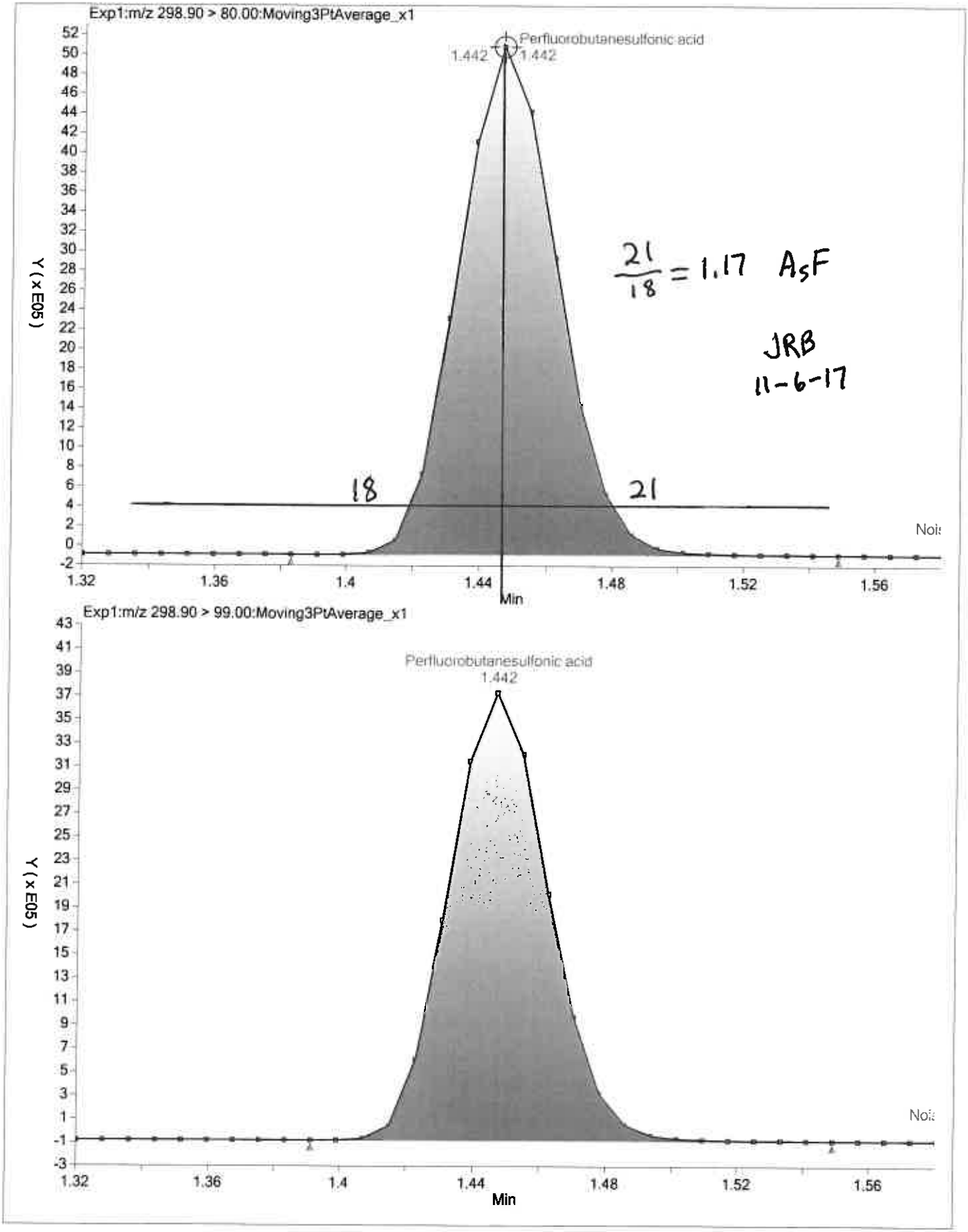
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192908/4	2017.11.03_537XICAL_004.d
Level 2	IC 320-192908/5	2017.11.03_537XICAL_005.d
Level 3	IC 320-192908/6	2017.11.03_537XICAL_006.d
Level 4	IC 320-192908/7	2017.11.03_537XICAL_007.d
Level 5	IC 320-192908/8	2017.11.03_537XICAL_008.d
Level 6	IC 320-192908/9	2017.11.03_537XICAL_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)	-6.0	-1.2	3.9	-3.1	1.9	-0.5	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	0.7	-1.9	1.9	-2.0	-3.8	5.1	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	-1.7	-2.3	4.0	-0.7	0.1	0.6	50	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	5.4	-3.7	-2.8	-3.3	-1.5	5.8	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-4.6	-1.9	-1.2	-1.3	3.5	5.5	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-0.5	-5.4	-0.3	2.5	-2.5	6.0	50	30	30	30	30	30
13C2 PFHxA	-1.0	-4.3	0.4	1.1	-2.1	6.0	30	30	30	30	30	30
13C2 PFDA	1.3	-4.7	-1.1	2.1	-4.2	6.6	30	30	30	30	30	30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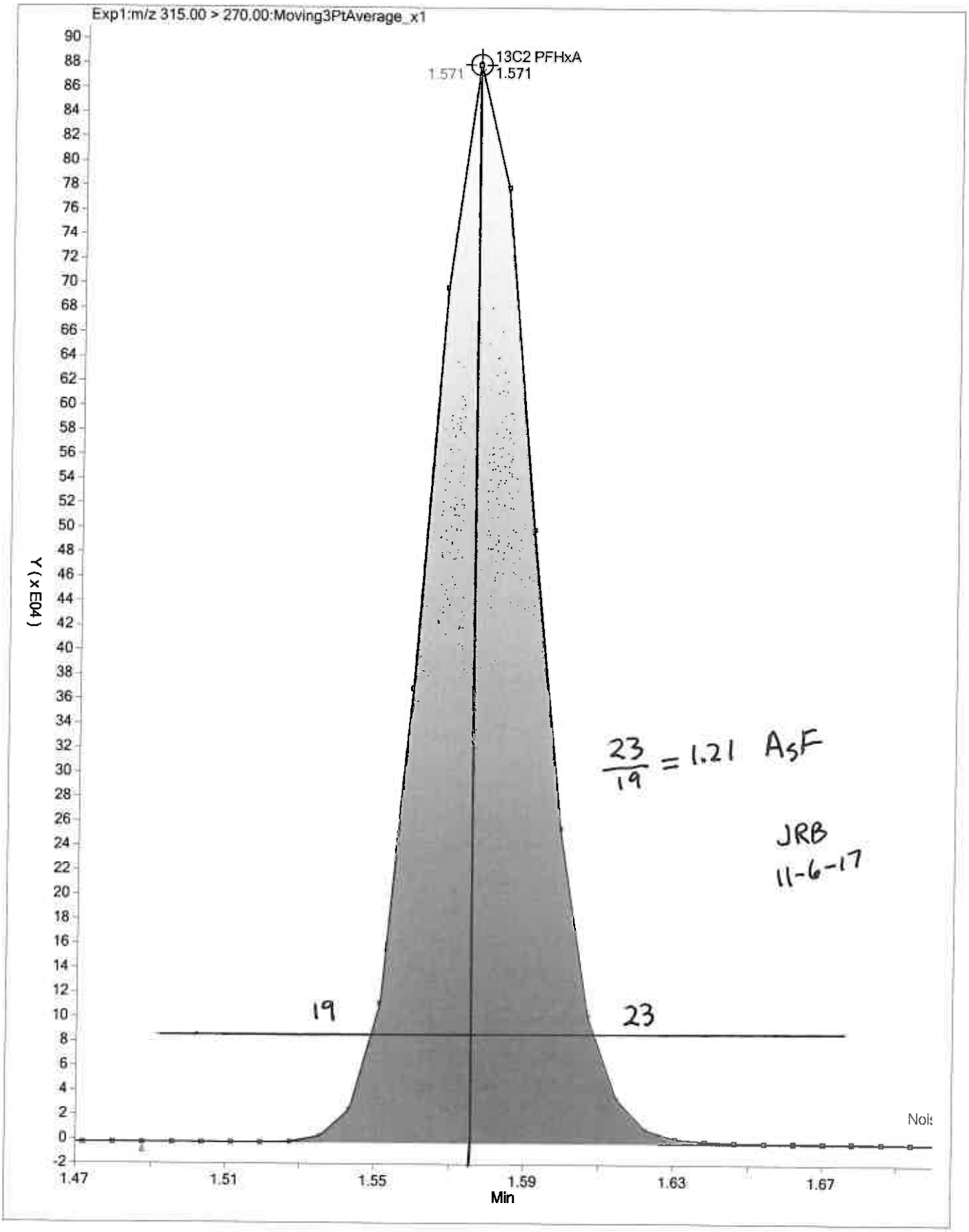
Perfluorobutanesulfonic acid
1.442
1.442
Y (x E05)
Min
18
21
21/18 = 1.17 AsF
JRB
11-6-17
Exp1:m/z 298.90 > 99.00:Moving3PtAverage_x1
Perfluorobutanesulfonic acid
1.442
Y (x E05)
Min


Exp1:m/z 315.00 > 270.00:Moving3PtAverage_x1
13C2 PFHxA
1.571
1.571
Y (x E04)
Min
1.47
1.51
1.55
1.59
1.63
1.67
19
23
23/19 = 1.21 ASF
JRB
11-6-17

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Lab Sample ID: CCVL 320-192908/11 Calibration Date: 11/03/2017 14:10

Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/03/2017 14:01

Lab File ID: 2017.11.03_537XICAL_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.109		20.4	20.0	1.9	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9382		2.23	2.22	0.1	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.688		6.72	6.67	0.8	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8825		4.24	4.45	-4.7	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9176		8.69	8.89	-2.3	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6625		4.43	4.45	-0.2	50.0
13C2 PFHxA	Ave	1.100	1.068		9.70	10.0	-3.0	30.0
13C2 PFDA	Ave	0.7652	0.7460		9.75	10.0	-2.5	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Lab Sample ID: ICV 320-192908/13 Calibration Date: 11/03/2017 14:20

Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/03/2017 14:01

Lab File ID: 2017.11.03_537XICAL_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.8310		83.7	100	-16.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.8136		8.68	10.0	-13.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.463		17.5	20.1	-12.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.7995		17.7	20.5	-13.6	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.8637		18.1	19.7	-8.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6428		19.5	20.1	-3.2	30.0
13C2 PFHxA	Ave	1.100	1.039		9.44	10.0	-5.6	30.0
13C2 PFDA	Ave	0.7652	0.7391		9.66	10.0	-3.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Lab Sample ID: CCVL 320-194241/1 Calibration Date: 11/13/2017 02:37

Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/03/2017 14:01

Lab File ID: 2017.11.13_537A_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.127		20.7	20.0	3.5	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9071		2.15	2.22	-3.2	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.664		6.63	6.67	-0.6	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9135		4.39	4.45	-1.3	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9202		8.71	8.89	-2.0	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6934		4.64	4.45	4.4	50.0
13C2 PFHxA	Ave	1.100	1.120		10.2	10.0	1.8	30.0
13C2 PFDA	Ave	0.7652	0.7392		9.66	10.0	-3.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Lab Sample ID: CCV 320-194241/2 Calibration Date: 11/13/2017 02:41

Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/03/2017 14:01

Lab File ID: 2017.11.13_537A_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.145		49.3	45.0	9.5	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9151		4.88	5.00	-2.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.751		15.7	15.0	4.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9280		10.0	10.0	0.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9620		20.5	20.0	2.5	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6857		10.3	10.0	3.2	30.0
13C2 PFHxA	Ave	1.100	1.080		9.82	10.0	-1.8	30.0
13C2 PFDA	Ave	0.7652	0.7611		9.95	10.0	-0.5	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Lab Sample ID: CCV 320-194241/14 Calibration Date: 11/13/2017 03:38

Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/03/2017 14:01

Lab File ID: 2017.11.13_537A_017.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.9190		135	135	0.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9320		14.9	15.0	-0.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.682		45.2	45.0	0.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9706		31.5	30.0	4.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9543		61.0	60.0	1.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6855		31.0	30.0	3.2	30.0
13C2 PFHxA	Ave	1.100	1.089		9.90	10.0	-1.0	30.0
13C2 PFDA	Ave	0.7652	0.7607		9.94	10.0	-0.6	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Lab Sample ID: CCV 320-194251/14 Calibration Date: 11/13/2017 03:38

Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/03/2017 14:01

Lab File ID: 2017.11.13_537A_017.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.9190		135	135	0.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9320		14.9	15.0	-0.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.682		45.2	45.0	0.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9706		31.5	30.0	4.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9543		61.0	60.0	1.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6855		31.0	30.0	3.2	30.0
13C2 PFHxA	Ave	1.100	1.089		9.90	10.0	-1.0	30.0
13C2 PFDA	Ave	0.7652	0.7607		9.94	10.0	-0.6	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Lab Sample ID: CCV 320-194251/25 Calibration Date: 11/13/2017 04:29

Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/03/2017 14:01

Lab File ID: 2017.11.13_537A_028.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.109		47.6	45.0	5.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.8978		4.79	5.00	-4.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.698		15.2	15.0	1.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9001		9.73	10.0	-2.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9068		19.3	20.0	-3.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6547		9.86	10.0	-1.4	30.0
13C2 PFHxA	Ave	1.100	1.061		9.65	10.0	-3.5	30.0
13C2 PFDA	Ave	0.7652	0.7009		9.16	10.0	-8.4	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Instrument ID: A8_N Start Date: 11/03/2017 13:37

Analysis Batch Number: 192908 End Date: 11/03/2017 14:24

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-192908/4		11/03/2017 13:37	1	2017.11.03_537X ICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-192908/5		11/03/2017 13:42	1	2017.11.03_537X ICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-192908/6		11/03/2017 13:47	1	2017.11.03_537X ICAL 006.d	GeminiC18 3x100 3(mm)
IC 320-192908/7 ICISAV		11/03/2017 13:52	1	2017.11.03_537X ICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-192908/8		11/03/2017 13:56	1	2017.11.03_537X ICAL 008.d	GeminiC18 3x100 3(mm)
IC 320-192908/9		11/03/2017 14:01	1	2017.11.03_537X ICAL 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/03/2017 14:06	1		GeminiC18 3x100 3(mm)
CCVL 320-192908/11		11/03/2017 14:10	1	2017.11.03_537X ICAL 011.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/03/2017 14:15	1		GeminiC18 3x100 3(mm)
ICV 320-192908/13		11/03/2017 14:20	1	2017.11.03_537X ICAL 013.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/03/2017 14:24	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Instrument ID: A8_N Start Date: 11/13/2017 02:37

Analysis Batch Number: 194241 End Date: 11/13/2017 03:38

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-194241/1		11/13/2017 02:37	1	2017.11.13_537A_004.d	GeminiC18 3x100 3(mm)
CCV 320-194241/2 CCVIS		11/13/2017 02:41	1	2017.11.13_537A_005.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/13/2017 02:46	1		GeminiC18 3x100 3(mm)
MB 320-193512/1-A		11/13/2017 02:51	1	2017.11.13_537A_007.d	GeminiC18 3x100 3(mm)
LCS 320-193512/2-A		11/13/2017 02:55	1	2017.11.13_537A_008.d	GeminiC18 3x100 3(mm)
LCSD 320-193512/3-A		11/13/2017 03:00	1	2017.11.13_537A_009.d	GeminiC18 3x100 3(mm)
320-33018-1		11/13/2017 03:05	1	2017.11.13_537A_010.d	GeminiC18 3x100 3(mm)
320-33018-2		11/13/2017 03:09	1	2017.11.13_537A_011.d	GeminiC18 3x100 3(mm)
320-33018-3		11/13/2017 03:14	1	2017.11.13_537A_012.d	GeminiC18 3x100 3(mm)
320-33018-4		11/13/2017 03:19	1	2017.11.13_537A_013.d	GeminiC18 3x100 3(mm)
320-33018-5		11/13/2017 03:24	1	2017.11.13_537A_014.d	GeminiC18 3x100 3(mm)
320-33018-6		11/13/2017 03:28	1	2017.11.13_537A_015.d	GeminiC18 3x100 3(mm)
320-33018-7		11/13/2017 03:33	1	2017.11.13_537A_016.d	GeminiC18 3x100 3(mm)
CCV 320-194241/14 CCVIS		11/13/2017 03:38	1	2017.11.13_537A_017.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Instrument ID: A8_N Start Date: 11/13/2017 03:38

Analysis Batch Number: 194251 End Date: 11/13/2017 04:29

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-194251/14 CCVIS		11/13/2017 03:38	1	2017.11.13_537A_017.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/13/2017 03:42	1		GeminiC18 3x100 3(mm)
320-33018-8		11/13/2017 03:47	1	2017.11.13_537A_019.d	GeminiC18 3x100 3(mm)
320-33018-9		11/13/2017 03:52	1	2017.11.13_537A_020.d	GeminiC18 3x100 3(mm)
320-33018-10		11/13/2017 03:56	1	2017.11.13_537A_021.d	GeminiC18 3x100 3(mm)
320-33018-11		11/13/2017 04:01	1	2017.11.13_537A_022.d	GeminiC18 3x100 3(mm)
320-33018-12		11/13/2017 04:06	1	2017.11.13_537A_023.d	GeminiC18 3x100 3(mm)
320-33018-13		11/13/2017 04:10	1	2017.11.13_537A_024.d	GeminiC18 3x100 3(mm)
320-33018-14		11/13/2017 04:15	1	2017.11.13_537A_025.d	GeminiC18 3x100 3(mm)
320-33018-15		11/13/2017 04:20	1	2017.11.13_537A_026.d	GeminiC18 3x100 3(mm)
320-33018-16		11/13/2017 04:24	1	2017.11.13_537A_027.d	GeminiC18 3x100 3(mm)
CCV 320-194251/25 CCVIS		11/13/2017 04:29	1	2017.11.13_537A_028.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1

SDG No.:

Batch Number: 193512 Batch Start Date: 11/08/17 11:47 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 11/10/17 21:40

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00023
MB 320-193512/1		537, 537				250.00 mL	1.00 mL	7 SU	
LCS 320-193512/2		537, 537				250.00 mL	1.00 mL	7 SU	100 uL
LCSD 320-193512/3		537, 537				250.00 mL	1.00 mL	7 SU	100 uL
320-33018-A-1	NAWC-110217-RW-286	537, 537	T	270.43 g	28.11 g	242.3 mL	1.00 mL	7 SU	
320-33018-A-2	NAWC-110217-FRB-286	537, 537	T	271.04 g	27.17 g	243.9 mL	1.00 mL	7 SU	
320-33018-A-3	WGNA-110217-RW-3978	537, 537	T	273.22 g	27.56 g	245.7 mL	1.00 mL	7 SU	
320-33018-A-4	WGNA-110217-FRB-3978	537, 537	T	274.53 g	27.09 g	247.4 mL	1.00 mL	7 SU	
320-33018-A-5	NAWC-110217-RW-177-IRR	537, 537	T	270.84 g	27.71 g	243.1 mL	1.00 mL	7 SU	
320-33018-A-6	NAWC-110217-FRB-177-IRR	537, 537	T	273.38 g	27.11 g	246.3 mL	1.00 mL	7 SU	
320-33018-A-7	NAWC-110217-RW-177-SHOP	537, 537	T	271.42 g	27.64 g	243.8 mL	1.00 mL	7 SU	
320-33018-A-8	NAWC-110217-FRB-177-SHOP	537, 537	T	278.25 g	27.13 g	251.1 mL	1.00 mL	7 SU	
320-33018-A-9	NAWC-110217-RW-185	537, 537	T	276.72 g	27.58 g	249.1 mL	1.00 mL	7 SU	
320-33018-A-10	NAWC-110217-FRB-185	537, 537	T	278.08 g	27.51 g	250.6 mL	1.00 mL	7 SU	
320-33018-A-11	NAWC-110217-RW-355	537, 537	T	277.12 g	27.81 g	249.3 mL	1.00 mL	7 SU	
320-33018-A-12	NAWC-110217-FRB-355	537, 537	T	272.81 g	27.63 g	245.2 mL	1.00 mL	7 SU	
320-33018-A-13	NAWC-110217-RW-348	537, 537	T	278.13 g	27.83 g	250.3 mL	1.00 mL	7 SU	
320-33018-A-14	NAWC-110217-FRB-348	537, 537	T	279.53 g	27.08 g	252.5 mL	1.00 mL	7 SU	
320-33018-A-15	WGNA-110217-RW-3882	537, 537	T	278.85 g	27.95 g	250.9 mL	1.00 mL	7 SU	
320-33018-A-16	WGNA-110217-FRB-3882	537, 537	T	275.73 g	27.85 g	247.9 mL	1.00 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00050	LC537-SU 00051	AnalysisComment			
MB 320-193512/1		537, 537		100 uL	100 uL	Cl 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.: 320-33018-1

SDG No.:

Batch Number: 193512 Batch Start Date: 11/08/17 11:47 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 11/10/17 21:40

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00050	LC537-SU 00051	AnalysisComment			
LCS 320-193512/2		537, 537		100 uL	100 uL	Cl ND			
LCSD 320-193512/3		537, 537		100 uL	100 uL	Cl ND			
320-33018-A-1	NAWC-110217-RW-286	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-2	NAWC-110217-FRB-286	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-3	WGNA-110217-RW-3978	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-4	WGNA-110217-FRB-3978	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-5	NAWC-110217-RW-177-IRR	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-6	NAWC-110217-FRB-177-IRR	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-7	NAWC-110217-RW-177-SHOP	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-8	NAWC-110217-FRB-177-SHOP	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-9	NAWC-110217-RW-185	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-10	NAWC-110217-FRB-185	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-11	NAWC-110217-RW-355	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-12	NAWC-110217-FRB-355	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-13	NAWC-110217-RW-348	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-14	NAWC-110217-FRB-348	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-15	WGNA-110217-RW-3882	537, 537	T	100 uL	100 uL	Cl ND			
320-33018-A-16	WGNA-110217-FRB-3882	537, 537	T	100 uL	100 uL	Cl 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.: 320-33018-1

SDG No.:

Batch Number: 193512 Batch Start Date: 11/08/17 11:47 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 11/10/17 21:40

Batch Notes	
Analyst ID - Aliquot Step	TWL
Analyst ID - Concentration	NIGHTS/CCB
Analyst ID - Final Volume Step	CCB
Internal Standard ID#	1041858
Manifold ID	3, 4
Methanol ID	1076416
Pipette ID	M16387D
Analyst ID - IS Reagent Drop	CCB
Analyst ID - IS Reagent Drop Witness	JNS
Analyst ID - SU Reagent Drop	VPM
Analyst ID - SU Reagent Drop Witness	KMK
Analyst ID - TA Reagent Drop	VPM
Analyst ID - TA Reagent Drop Witness	KMK
SPE Cartridge ID	6357081-09
Trizma ID	SLBR4303V
Reagent Water ID	11-2-17

Basis	Basis Description
T	Total/NA

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

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

79 AS 11/12/17 AS 11/15/17

Batch Number: 320-193512

Method Code: 320-537_Prep-320

Analyst: Kolstad, Kate M

Batch Open: 11/8/2017 11:47:00AM

Batch End: 11/10/2017 9:40:00PM

Extraction of Perfluorinated Alkyl Acids

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-193512/1 N/A	N/A		250.00 mL 1.00 mL	7			N/A	N/A	N/A	CI ND	MB 320-193512/1-A
2	LCS~320-193512/2 N/A	N/A		250.00 mL 1.00 mL	7			N/A	N/A	N/A	CI ND	LCS 320-193512/2-A
3	LCSD~320-193512/3 N/A	N/A		250.00 mL 1.00 mL	7			N/A	N/A	N/A	CI ND	LCSD 320-193512/3-A
4	320-33018-A-1 (537_DOD5)	N/A (320-33018-1)	270.43 g 28.11 g	242.3 mL 1.00 mL	7			11/7/17	16_Days	4	CI ND	320-33018-A-1-A
5	320-33018-A-2 (537_DOD5)	N/A (320-33018-1)	271.04 g 27.17 g	243.9 mL 1.00 mL	7			11/7/17	16_Days	4	CI ND	320-33018-A-2-A
6	320-33018-A-3 (537_DOD5)	N/A (320-33018-1)	273.22 g 27.56 g	245.7 mL 1.00 mL	7			11/7/17	16_Days	4	CI ND	320-33018-A-3-A
7	320-33018-A-4 (537_DOD5)	N/A (320-33018-1)	274.53 g 27.09 g	247.4 mL 1.00 mL	7			11/7/17	16_Days	4	CI ND	320-33018-A-4-A
8	320-33018-A-5 (537_DOD5)	N/A (320-33018-1)	270.84 g 27.71 g	243.1 mL 1.00 mL	7			11/7/17	16_Days	4	CI ND RI	320-33018-A-5-A
9	320-33018-A-6 (537_DOD5)	N/A (320-33018-1)	273.38 g 27.11 g	246.3 mL 1.00 mL	7			11/7/17	16_Days	4	CI ND	320-33018-A-6-A
10	320-33018-A-7 (537_DOD5)	N/A (320-33018-1)	271.42 g 27.64 g	243.8 mL 1.00 mL	7			11/7/17	16_Days	4	CI ND RI	320-33018-A-7-A

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512

Analyst: Kolstad, Kate M

Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537_Prep-320

Batch End: 11/10/2017 9:40:00PM

11	320-33018-A-8 (537_DOD5)	N/A (320-33018-1)	278.25 g / 27.13 g	251.1 mL / 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
12	320-33018-A-9 (537_DOD5)	N/A (320-33018-1)	276.72 g / 27.58 g	249.1 mL / 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
13	320-33018-A-10 (537_DOD5)	N/A (320-33018-1)	278.08 g / 27.51 g	250.6 mL / 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
14	320-33018-A-11 (537_DOD5)	N/A (320-33018-1)	277.12 g / 27.81 g	249.3 mL / 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
15	320-33018-A-12 (537_DOD5)	N/A (320-33018-1)	272.81 g / 27.63 g	245.2 mL / 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
16	320-33018-A-13 (537_DOD5)	N/A (320-33018-1)	278.13 g / 27.83 g	250.3 mL / 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
17	320-33018-A-14 (537_DOD5)	N/A (320-33018-1)	279.53 g / 27.08 g	252.5 mL / 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
18	320-33018-A-15 (537_DOD5)	N/A (320-33018-1)	278.85 g / 27.95 g	250.9 mL / 1.00 mL	7			11/7/17	16_Days	4	Cl ND	
19	320-33018-A-16 (537_DOD5)	N/A (320-33018-1)	275.73 g / 27.85 g	247.9 mL / 1.00 mL	7			11/7/17	16_Days	4	Cl ND	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512

Method Code: 320-537_Prep-320

Analyst: Kolstad, Kate M

Batch Open: 11/8/2017 11:47:00AM

Batch End: 11/10/2017 9:40:00PM

Batch Notes

Manifold ID	3, 4
Trizma ID	SLBR4303V
SPE Cartridge ID	6357081-09
Methanol ID	1076416
Reagent Water ID	11-2-17
Internal Standard ID#	1041858
Pipette ID	M16387D
Analyst ID - TA Reagent Drop	VPM
Analyst ID - TA Reagent Drop Witness	KMK
Analyst ID - SU Reagent Drop	VPM
Analyst ID - SU Reagent Drop Witness	KMK
Analyst ID - IS Reagent Drop	CCB
Analyst ID - IS Reagent Drop Witness	JNS
Analyst ID - Concentration	NIGHTS/CCB
Analyst ID - Aliquot Step	TWL
Analyst ID - Final Volume Step	CCB
Batch Comment	NA

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512

Method Code: 320-537_Prep-320

Analyst: Kolstad, Kate M

Batch Open: 11/8/2017 11:47:00AM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-193512/1	LC537-SU_00051	100 uL	1.00 mL	VPM 11/8/17	kmk 11-8-17
LCS 320-193512/2	LC537-HSP_00023	100 uL	1.00 mL		
LCS 320-193512/2	LC537-SU_00051	100 uL	1.00 mL		
LCSD 320-193512/3	LC537-HSP_00023	100 uL	1.00 mL		
LCSD 320-193512/3	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-1	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-2	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-3	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-4	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-5	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-6	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-7	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-8	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-9	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-10	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-11	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-12	LC537-SU_00051	100 uL	1.00 mL		
320-33018-A-13	LC537-SU_00051	100 uL	1.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512

Analyst: Kolstad, Kate M

Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537_Prep-320

Batch End:

320-33018-A-14	LC537-SU_00051	100 uL	1.00 mL	VPM 11/8/17	KMK 11-8-17
320-33018-A-15	LC537-SU_00051	100 uL	1.00 mL	↓	↓
320-33018-A-16	LC537-SU_00051	100 uL	1.00 mL	↓	↓

Other Reagents:

Reagent	Amount/Units	Lot#:

PFAS Calibration Calculations:

Initial Calibration 11/3/2017
Instrument A8_N

Perfluorohexanesulfonic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
3	568156	3298877	28.7	1.64764	1.6459
6.67	1312135	3450592	28.7	1.63622	1.6355
15	2908204	3194016	28.7	1.74212	1.7405
30	5871843	3374600	28.7	1.66461	1.6631
45	8413133	3199479	28.7	1.67706	1.6755
60	11071993	3141787	28.7	1.68570	1.6841
			Average	1.67556	1.6741
			Standard Deviation	0.0374	
			RSD	0.0223	
			%RSD	2.23033	2.2

Continuing Calibration 11/13/2017 @ 2:37
A8_N

Perfluorohexanesulfonic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
6.67	1242810	3212610	28.7	1.6646	-0.569094	1.664	-0.6

Willow Grove
SDG 320-33018-1

Sample Identification	NAWC-110217-RW-286	
Compound	Perfluorohexanesulfonic acid	
Compound Area	287773	
Internal Standard Amount (ng)	28.7	
Dilution Factor	1	
Internal Standard Area	3118882	
Average RRF	1.6741	
Sample Volume(ml)	242.3	
Volume Extract (ml)	1	
Injection Volume (µl)	1	
Conversion factor	1000	
Concentration	6.5283	ng/L

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N

WARRINGTON

WARWICK

NORTHAMPTON

IVYLAND

WARMINSTER

HAGS

NASJRB
Willow Grove

HORSHAM

HATBORO

UPPER SOUTHAMPTON

UPPER MORELAND

LEGEND

- PFOA & PFOS BELOW DETECTION LIMITS
- SUM OF PFOA & PFOS CONCENTRATIONS AT OR BELOW 40 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS BETWEEN 40 PPT AND 70 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS ABOVE 70 PPT
- PUBLIC WATER CONNECTION (SOME NOT BY NAVY)
- SAMPLING AREA
- FORMER NAWC WARMINSTER
- TOWNSHIP BOUNDARY

3,000 1,500 0 3,000 6,000
Feet

NAVFAC

PFC SAMPLE RESULTS MAP
FORMER NAWC WAMINSTER
MONTGOMERY COUNTY, PENNSYLVANIA

SCALE	AS NOTED
FILE	NAWC
REV	0
DATE	01/24/19
FIGURE NUMBER	FIGURE 1