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 320-35090-1

Naval Air Warfare Center Warminster
Warminster, Pennsylvania

August 2019

N62269_001131
WARMINSTER_NAWC
SSIC 5000-33c

LABORATORY DATA PACKAGE, 320-35090-1, NAS WILLOW GROVE NAWC WARMINSTER PA

02/06/2018

TESTAMERICA LABORATORIES INC

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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 320-35090-1

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
2/6/2018 3:28 PM

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02/06/2018

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Qualifiers

LCMS

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

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
320-35090-1

Receipt
The samples were received on 1/16/2018 10:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.0º C.

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.

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

Organic Prep
Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-205981.

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

Detection Summary

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

TestAmerica Job ID: 320-35090-1

Client Sample ID: NAWC-011518-RW-21 — Lab Sample ID: 320-35090-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	7.3	J M	40	6.8	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	11	J	20	2.8	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-011518-FRB-21 — Lab Sample ID: 320-35090-2

No Detections.

Client Sample ID: NAWC-011518-RW-233 — Lab Sample ID: 320-35090-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	8.1	J M	39	6.7	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	11	J	20	2.8	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.0	J	9.9	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-011518-FRB-233 — Lab Sample ID: 320-35090-4

No Detections.

Client Sample ID: NAWC-011518-RW-241 — Lab Sample ID: 320-35090-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	16	J M	40	6.8	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	13	J	20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	7.1	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-011518-FRB-241 — Lab Sample ID: 320-35090-6

No Detections.

Client Sample ID: WGNA-011518-RW-3385 — Lab Sample ID: 320-35090-7

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	15	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
Perfluoroheptanoic acid (PFHpA)	4.5	J	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: WGNA-011518-FRB-3385 — Lab Sample ID: 320-35090-8

No Detections.

Client Sample ID: WGNA-011518-DUP19 — Lab Sample ID: 320-35090-9

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	16	J M	40	6.9	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	14	J	20	2.8	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.5	J	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-011518-RW-213 — Lab Sample ID: 320-35090-10

This Detection Summary does not include radiochemical test results.

Client Sample ID: NAWC-011518-RW-213 (Continued) Lab Sample ID: 320-35090-10

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	40	M	40	6.8	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	24		20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	7.6	J	30	5.5	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	7.0	J	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-011518-FRB-213 Lab Sample ID: 320-35090-11

No Detections.

Client Sample ID: NAWC-011518-RW-215 Lab Sample ID: 320-35090-12

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	14	J M	40	6.9	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	10	J	20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.7	J	30	5.6	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.2	J	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-011518-FRB-215 Lab Sample ID: 320-35090-13

No Detections.

Client Sample ID: NAWC-011518-RW-48 Lab Sample ID: 320-35090-14

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	6.1	J	20	2.8	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.9	J	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-011518-FRB-48 Lab Sample ID: 320-35090-15

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: NAWC-011518-RW-21 — Lab Sample ID: 320-35090-1

Date Collected: 01/15/18 08:10 — **Matrix: Water**
Date Received: 01/16/18 10:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**7.3**	**J M**	40	6.8	ng/L		01/29/18 12:24	02/02/18 14:47	1
Perfluorooctanoic acid (PFOA)	**11**	**J**	20	2.8	ng/L		01/29/18 12:24	02/02/18 14:47	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		01/29/18 12:24	02/02/18 14:47	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		01/29/18 12:24	02/02/18 14:47	1
Perfluoroheptanoic acid (PFHpA)	**4.7**	**J**	10	1.9	ng/L		01/29/18 12:24	02/02/18 14:47	1
Perfluorobutanesulfonic acid (PFBS)	36	U M	91	16	ng/L		01/29/18 12:24	02/02/18 14:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*103*		*70 - 130*	*01/29/18 12:24*	*02/02/18 14:47*	*1*
13C2 PFDA	*105*		*70 - 130*	*01/29/18 12:24*	*02/02/18 14:47*	*1*

Client Sample ID: NAWC-011518-FRB-21 — Lab Sample ID: 320-35090-2

Date Collected: 01/15/18 08:05 — **Matrix: Water**
Date Received: 01/16/18 10:15

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		01/29/18 12:24	02/02/18 14:52	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		01/29/18 12:24	02/02/18 14:52	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		01/29/18 12:24	02/02/18 14:52	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		01/29/18 12:24	02/02/18 14:52	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		01/29/18 12:24	02/02/18 14:52	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		01/29/18 12:24	02/02/18 14:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*105*		*70 - 130*	*01/29/18 12:24*	*02/02/18 14:52*	*1*
13C2 PFDA	*110*		*70 - 130*	*01/29/18 12:24*	*02/02/18 14:52*	*1*

Client Sample ID: NAWC-011518-RW-233 — Lab Sample ID: 320-35090-3

Date Collected: 01/15/18 08:40 — **Matrix: Water**
Date Received: 01/16/18 10:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**8.1**	**J M**	39	6.7	ng/L		01/29/18 12:24	02/02/18 14:56	1
Perfluorooctanoic acid (PFOA)	**11**	**J**	20	2.8	ng/L		01/29/18 12:24	02/02/18 14:56	1
Perfluorononanoic acid (PFNA)	20	U M	24	7.9	ng/L		01/29/18 12:24	02/02/18 14:56	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.4	ng/L		01/29/18 12:24	02/02/18 14:56	1
Perfluoroheptanoic acid (PFHpA)	**6.0**	**J**	9.9	1.9	ng/L		01/29/18 12:24	02/02/18 14:56	1
Perfluorobutanesulfonic acid (PFBS)	35	U M	89	16	ng/L		01/29/18 12:24	02/02/18 14:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*97*		*70 - 130*	*01/29/18 12:24*	*02/02/18 14:56*	*1*
13C2 PFDA	*99*		*70 - 130*	*01/29/18 12:24*	*02/02/18 14:56*	*1*

Client Sample ID: NAWC-011518-FRB-233 — Lab Sample ID: 320-35090-4

Date Collected: 01/15/18 08:35 **Matrix: Water**
Date Received: 01/16/18 10:15

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		01/29/18 12:24	02/02/18 15:01	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		01/29/18 12:24	02/02/18 15:01	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		01/29/18 12:24	02/02/18 15:01	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		01/29/18 12:24	02/02/18 15:01	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		01/29/18 12:24	02/02/18 15:01	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		01/29/18 12:24	02/02/18 15:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*106*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:01*	*1*
13C2 PFDA	*106*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:01*	*1*

Client Sample ID: NAWC-011518-RW-241 — Lab Sample ID: 320-35090-5

Date Collected: 01/15/18 09:10 **Matrix: Water**
Date Received: 01/16/18 10:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**16**	**J M**	40	6.8	ng/L		01/29/18 12:24	02/02/18 15:06	1
Perfluorooctanoic acid (PFOA)	**13**	**J**	20	2.8	ng/L		01/29/18 12:24	02/02/18 15:06	1
Perfluorononanoic acid (PFNA)	20	U M	24	8.0	ng/L		01/29/18 12:24	02/02/18 15:06	1
Perfluorohexanesulfonic acid (PFHxS)	**7.1**	**J**	30	5.5	ng/L		01/29/18 12:24	02/02/18 15:06	1
Perfluoroheptanoic acid (PFHpA)	**4.7**	**J**	10	1.9	ng/L		01/29/18 12:24	02/02/18 15:06	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		01/29/18 12:24	02/02/18 15:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*103*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:06*	*1*
13C2 PFDA	*107*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:06*	*1*

Client Sample ID: NAWC-011518-FRB-241 — Lab Sample ID: 320-35090-6

Date Collected: 01/15/18 09:05 **Matrix: Water**
Date Received: 01/16/18 10:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	39	6.7	ng/L		01/29/18 12:24	02/02/18 15:20	1
Perfluorooctanoic acid (PFOA)	7.9	U	20	2.8	ng/L		01/29/18 12:24	02/02/18 15:20	1
Perfluorononanoic acid (PFNA)	20	U	24	7.9	ng/L		01/29/18 12:24	02/02/18 15:20	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.4	ng/L		01/29/18 12:24	02/02/18 15:20	1
Perfluoroheptanoic acid (PFHpA)	3.9	U	9.9	1.9	ng/L		01/29/18 12:24	02/02/18 15:20	1
Perfluorobutanesulfonic acid (PFBS)	36	U	89	16	ng/L		01/29/18 12:24	02/02/18 15:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*103*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:20*	*1*
13C2 PFDA	*117*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:20*	*1*

Client Sample ID: WGNA-011518-RW-3385 — Lab Sample ID: 320-35090-7

Date Collected: 01/15/18 09:40 **Matrix: Water**
Date Received: 01/16/18 10:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**15**	**J M**	41	6.9	ng/L		01/29/18 12:24	02/02/18 15:24	1
Perfluorooctanoic acid (PFOA)	**14**	**J**	20	2.8	ng/L		01/29/18 12:24	02/02/18 15:24	1
Perfluorononanoic acid (PFNA)	20	U M	24	8.1	ng/L		01/29/18 12:24	02/02/18 15:24	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	31	5.6	ng/L		01/29/18 12:24	02/02/18 15:24	1
Perfluoroheptanoic acid (PFHpA)	**4.5**	**J**	10	1.9	ng/L		01/29/18 12:24	02/02/18 15:24	1
Perfluorobutanesulfonic acid (PFBS)	37	U M	92	16	ng/L		01/29/18 12:24	02/02/18 15:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*106*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:24*	*1*
13C2 PFDA	*105*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:24*	*1*

Client Sample ID: WGNA-011518-FRB-3385 — Lab Sample ID: 320-35090-8

Date Collected: 01/15/18 09:35 **Matrix: Water**
Date Received: 01/16/18 10:15

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		01/29/18 12:24	02/02/18 15:29	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		01/29/18 12:24	02/02/18 15:29	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		01/29/18 12:24	02/02/18 15:29	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		01/29/18 12:24	02/02/18 15:29	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		01/29/18 12:24	02/02/18 15:29	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		01/29/18 12:24	02/02/18 15:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*102*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:29*	*1*
13C2 PFDA	*98*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:29*	*1*

Client Sample ID: WGNA-011518-DUP19 — Lab Sample ID: 320-35090-9

Date Collected: 01/15/18 07:00 **Matrix: Water**
Date Received: 01/16/18 10:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**16**	**J M**	40	6.9	ng/L		01/29/18 12:24	02/02/18 15:34	1
Perfluorooctanoic acid (PFOA)	**14**	**J**	20	2.8	ng/L		01/29/18 12:24	02/02/18 15:34	1
Perfluorononanoic acid (PFNA)	20	U M	24	8.1	ng/L		01/29/18 12:24	02/02/18 15:34	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.6	ng/L		01/29/18 12:24	02/02/18 15:34	1
Perfluoroheptanoic acid (PFHpA)	**4.5**	**J**	10	1.9	ng/L		01/29/18 12:24	02/02/18 15:34	1
Perfluorobutanesulfonic acid (PFBS)	36	U	91	16	ng/L		01/29/18 12:24	02/02/18 15:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*103*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:34*	*1*
13C2 PFDA	*110*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:34*	*1*

Client Sample ID: NAWC-011518-RW-213 — Lab Sample ID: 320-35090-10

Date Collected: 01/15/18 10:10 **Matrix: Water**
Date Received: 01/16/18 10:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**40**	**M**	40	6.8	ng/L		01/29/18 12:24	02/02/18 15:38	1
Perfluorooctanoic acid (PFOA)	**24**		20	2.8	ng/L		01/29/18 12:24	02/02/18 15:38	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		01/29/18 12:24	02/02/18 15:38	1
Perfluorohexanesulfonic acid (PFHxS)	**7.6**	**J**	30	5.5	ng/L		01/29/18 12:24	02/02/18 15:38	1
Perfluoroheptanoic acid (PFHpA)	**7.0**	**J**	10	1.9	ng/L		01/29/18 12:24	02/02/18 15:38	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		01/29/18 12:24	02/02/18 15:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*102*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:38*	*1*
13C2 PFDA	*110*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:38*	*1*

Client Sample ID: NAWC-011518-FRB-213 — Lab Sample ID: 320-35090-11

Date Collected: 01/15/18 10:05 **Matrix: Water**
Date Received: 01/16/18 10:15

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		01/29/18 12:24	02/02/18 15:43	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		01/29/18 12:24	02/02/18 15:43	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		01/29/18 12:24	02/02/18 15:43	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		01/29/18 12:24	02/02/18 15:43	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		01/29/18 12:24	02/02/18 15:43	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		01/29/18 12:24	02/02/18 15:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*100*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:43*	*1*
13C2 PFDA	*110*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:43*	*1*

Client Sample ID: NAWC-011518-RW-215 — Lab Sample ID: 320-35090-12

Date Collected: 01/15/18 12:10 **Matrix: Water**
Date Received: 01/16/18 10:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**14**	**J M**	40	6.9	ng/L		01/29/18 12:24	02/02/18 15:48	1
Perfluorooctanoic acid (PFOA)	**10**	**J**	20	2.8	ng/L		01/29/18 12:24	02/02/18 15:48	1
Perfluorononanoic acid (PFNA)	20	U M	24	8.1	ng/L		01/29/18 12:24	02/02/18 15:48	1
Perfluorohexanesulfonic acid (PFHxS)	**6.7**	**J**	30	5.6	ng/L		01/29/18 12:24	02/02/18 15:48	1
Perfluoroheptanoic acid (PFHpA)	**3.2**	**J**	10	1.9	ng/L		01/29/18 12:24	02/02/18 15:48	1
Perfluorobutanesulfonic acid (PFBS)	36	U	91	16	ng/L		01/29/18 12:24	02/02/18 15:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*101*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:48*	*1*
13C2 PFDA	*109*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:48*	*1*

Client Sample ID: NAWC-011518-FRB-215 — Lab Sample ID: 320-35090-13

Date Collected: 01/15/18 12:05 **Matrix: Water**
Date Received: 01/16/18 10:15

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		01/29/18 12:24	02/02/18 15:53	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		01/29/18 12:24	02/02/18 15:53	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		01/29/18 12:24	02/02/18 15:53	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		01/29/18 12:24	02/02/18 15:53	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	9.9	1.9	ng/L		01/29/18 12:24	02/02/18 15:53	1
Perfluorobutanesulfonic acid (PFBS)	36	U	89	16	ng/L		01/29/18 12:24	02/02/18 15:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*100*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:53*	*1*
13C2 PFDA	*118*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:53*	*1*

Client Sample ID: NAWC-011518-RW-48 — Lab Sample ID: 320-35090-14

Date Collected: 01/15/18 13:10 **Matrix: Water**
Date Received: 01/16/18 10:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U M	41	6.9	ng/L		01/29/18 12:24	02/02/18 15:57	1
Perfluorooctanoic acid (PFOA)	**6.1**	**J**	20	2.8	ng/L		01/29/18 12:24	02/02/18 15:57	1
Perfluorononanoic acid (PFNA)	20	U	24	8.1	ng/L		01/29/18 12:24	02/02/18 15:57	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.6	ng/L		01/29/18 12:24	02/02/18 15:57	1
Perfluoroheptanoic acid (PFHpA)	**1.9**	**J**	10	1.9	ng/L		01/29/18 12:24	02/02/18 15:57	1
Perfluorobutanesulfonic acid (PFBS)	37	U M	91	16	ng/L		01/29/18 12:24	02/02/18 15:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*96*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:57*	*1*
13C2 PFDA	*107*		*70 - 130*	*01/29/18 12:24*	*02/02/18 15:57*	*1*

Client Sample ID: NAWC-011518-FRB-48 — Lab Sample ID: 320-35090-15

Date Collected: 01/15/18 13:05 **Matrix: Water**
Date Received: 01/16/18 10:15

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		01/29/18 12:24	02/02/18 16:02	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		01/29/18 12:24	02/02/18 16:02	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		01/29/18 12:24	02/02/18 16:02	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		01/29/18 12:24	02/02/18 16:02	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		01/29/18 12:24	02/02/18 16:02	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		01/29/18 12:24	02/02/18 16:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*107*		*70 - 130*	*01/29/18 12:24*	*02/02/18 16:02*	*1*
13C2 PFDA	*111*		*70 - 130*	*01/29/18 12:24*	*02/02/18 16:02*	*1*

Default Detection Limits

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-35090-1
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: 320-35090-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	PFHxA (70-130)	PFDA (70-130)								
320-35090-1	NAWC-011518-RW-21	103	105								
320-35090-2	NAWC-011518-FRB-21	105	110								
320-35090-3	NAWC-011518-RW-233	97	99								
320-35090-4	NAWC-011518-FRB-233	106	106								
320-35090-5	NAWC-011518-RW-241	103	107								
320-35090-6	NAWC-011518-FRB-241	103	117								
320-35090-7	WGNA-011518-RW-3385	106	105								
320-35090-8	WGNA-011518-FRB-3385	102	98								
320-35090-9	WGNA-011518-DUP19	103	110								
320-35090-10	NAWC-011518-RW-213	102	110								
320-35090-11	NAWC-011518-FRB-213	100	110								
320-35090-12	NAWC-011518-RW-215	101	109								
320-35090-13	NAWC-011518-FRB-215	100	118								
320-35090-14	NAWC-011518-RW-48	96	107								
320-35090-15	NAWC-011518-FRB-48	107	111								
LLCS 320-205981/2-A	Lab Control Sample	107	113								
LLCSD 320-205981/3-A	Lab Control Sample Dup	110	115								
MB 320-205981/1-A	Method Blank	105	113								

Surrogate Legend

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA

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

Lab Sample ID: MB 320-205981/1-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 206761 **Prep Batch: 205981**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		01/29/18 12:24	02/02/18 14:33	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		01/29/18 12:24	02/02/18 14:33	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		01/29/18 12:24	02/02/18 14:33	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		01/29/18 12:24	02/02/18 14:33	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		01/29/18 12:24	02/02/18 14:33	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		01/29/18 12:24	02/02/18 14:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*105*		*70 - 130*	*01/29/18 12:24*	*02/02/18 14:33*	*1*
13C2 PFDA	*113*		*70 - 130*	*01/29/18 12:24*	*02/02/18 14:33*	*1*

Lab Sample ID: LLCS 320-205981/2-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 206761 **Prep Batch: 205981**

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	40.0	41.0	M	ng/L		102	50 - 150
Perfluorooctanoic acid (PFOA)	20.0	21.1		ng/L		105	50 - 150
Perfluorononanoic acid (PFNA)	20.0	20.9	J	ng/L		105	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	30.0	33.4		ng/L		111	50 - 150
Perfluoroheptanoic acid (PFHpA)	10.0	11.3		ng/L		113	50 - 150
Perfluorobutanesulfonic acid (PFBS)	90.0	99.0		ng/L		110	50 - 150

Surrogate	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C2 PFHxA	*107*		*70 - 130*
13C2 PFDA	*113*		*70 - 130*

Lab Sample ID: LLCSD 320-205981/3-A **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 206761 **Prep Batch: 205981**

Analyte	Spike Added	LLCSD Result	LLCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	40.0	39.4	J M	ng/L		98	50 - 150	4	50
Perfluorooctanoic acid (PFOA)	20.0	20.8		ng/L		104	50 - 150	2	50
Perfluorononanoic acid (PFNA)	20.0	20.6	J	ng/L		103	50 - 150	2	50
Perfluorohexanesulfonic acid (PFHxS)	30.0	31.9		ng/L		106	50 - 150	5	50
Perfluoroheptanoic acid (PFHpA)	10.0	11.2		ng/L		112	50 - 150	1	50
Perfluorobutanesulfonic acid (PFBS)	90.0	91.9		ng/L		102	50 - 150	7	50

Surrogate	*LLCSD %Recovery*	*LLCSD Qualifier*	*Limits*
13C2 PFHxA	*110*		*70 - 130*
13C2 PFDA	*115*		*70 - 130*

LCMS

Prep Batch: 205981

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35090-1	NAWC-011518-RW-21	Total/NA	Water	537	
320-35090-2	NAWC-011518-FRB-21	Total/NA	Water	537	
320-35090-3	NAWC-011518-RW-233	Total/NA	Water	537	
320-35090-4	NAWC-011518-FRB-233	Total/NA	Water	537	
320-35090-5	NAWC-011518-RW-241	Total/NA	Water	537	
320-35090-6	NAWC-011518-FRB-241	Total/NA	Water	537	
320-35090-7	WGNA-011518-RW-3385	Total/NA	Water	537	
320-35090-8	WGNA-011518-FRB-3385	Total/NA	Water	537	
320-35090-9	WGNA-011518-DUP19	Total/NA	Water	537	
320-35090-10	NAWC-011518-RW-213	Total/NA	Water	537	
320-35090-11	NAWC-011518-FRB-213	Total/NA	Water	537	
320-35090-12	NAWC-011518-RW-215	Total/NA	Water	537	
320-35090-13	NAWC-011518-FRB-215	Total/NA	Water	537	
320-35090-14	NAWC-011518-RW-48	Total/NA	Water	537	
320-35090-15	NAWC-011518-FRB-48	Total/NA	Water	537	
MB 320-205981/1-A	Method Blank	Total/NA	Water	537	
LLCS 320-205981/2-A	Lab Control Sample	Total/NA	Water	537	
LLCSD 320-205981/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 206761

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35090-1	NAWC-011518-RW-21	Total/NA	Water	537	205981
320-35090-2	NAWC-011518-FRB-21	Total/NA	Water	537	205981
320-35090-3	NAWC-011518-RW-233	Total/NA	Water	537	205981
320-35090-4	NAWC-011518-FRB-233	Total/NA	Water	537	205981
320-35090-5	NAWC-011518-RW-241	Total/NA	Water	537	205981
MB 320-205981/1-A	Method Blank	Total/NA	Water	537	205981
LLCS 320-205981/2-A	Lab Control Sample	Total/NA	Water	537	205981
LLCSD 320-205981/3-A	Lab Control Sample Dup	Total/NA	Water	537	205981

Analysis Batch: 206762

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35090-6	NAWC-011518-FRB-241	Total/NA	Water	537	205981
320-35090-7	WGNA-011518-RW-3385	Total/NA	Water	537	205981
320-35090-8	WGNA-011518-FRB-3385	Total/NA	Water	537	205981
320-35090-9	WGNA-011518-DUP19	Total/NA	Water	537	205981
320-35090-10	NAWC-011518-RW-213	Total/NA	Water	537	205981
320-35090-11	NAWC-011518-FRB-213	Total/NA	Water	537	205981
320-35090-12	NAWC-011518-RW-215	Total/NA	Water	537	205981
320-35090-13	NAWC-011518-FRB-215	Total/NA	Water	537	205981
320-35090-14	NAWC-011518-RW-48	Total/NA	Water	537	205981
320-35090-15	NAWC-011518-FRB-48	Total/NA	Water	537	205981

Lab Chronicle

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

TestAmerica Job ID: 320-35090-1

Client Sample ID: NAWC-011518-RW-21
Lab Sample ID: 320-35090-1
Date Collected: 01/15/18 08:10
Matrix: Water
Date Received: 01/16/18 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			205981	01/29/18 12:24	KMK	TAL SAC
Total/NA	Analysis	537		1	206761	02/02/18 14:47	JRB	TAL SAC

Client Sample ID: NAWC-011518-FRB-21
Lab Sample ID: 320-35090-2
Date Collected: 01/15/18 08:05
Matrix: Water
Date Received: 01/16/18 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			205981	01/29/18 12:24	KMK	TAL SAC
Total/NA	Analysis	537		1	206761	02/02/18 14:52	JRB	TAL SAC

Client Sample ID: NAWC-011518-RW-233
Lab Sample ID: 320-35090-3
Date Collected: 01/15/18 08:40
Matrix: Water
Date Received: 01/16/18 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			205981	01/29/18 12:24	KMK	TAL SAC
Total/NA	Analysis	537		1	206761	02/02/18 14:56	JRB	TAL SAC

Client Sample ID: NAWC-011518-FRB-233
Lab Sample ID: 320-35090-4
Date Collected: 01/15/18 08:35
Matrix: Water
Date Received: 01/16/18 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			205981	01/29/18 12:24	KMK	TAL SAC
Total/NA	Analysis	537		1	206761	02/02/18 15:01	JRB	TAL SAC

Client Sample ID: NAWC-011518-RW-241
Lab Sample ID: 320-35090-5
Date Collected: 01/15/18 09:10
Matrix: Water
Date Received: 01/16/18 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			205981	01/29/18 12:24	KMK	TAL SAC
Total/NA	Analysis	537		1	206761	02/02/18 15:06	JRB	TAL SAC

Client Sample ID: NAWC-011518-FRB-241
Lab Sample ID: 320-35090-6
Date Collected: 01/15/18 09:05
Matrix: Water
Date Received: 01/16/18 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			205981	01/29/18 12:24	KMK	TAL SAC
Total/NA	Analysis	537		1	206762	02/02/18 15:20	ABH	TAL SAC

Client Sample ID: WGNA-011518-RW-3385 — Lab Sample ID: 320-35090-7

Date Collected: 01/15/18 09:40 — **Matrix: Water**
Date Received: 01/16/18 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			205981	01/29/18 12:24	KMK	TAL SAC
Total/NA	Analysis	537		1	206762	02/02/18 15:24	ABH	TAL SAC

Client Sample ID: WGNA-011518-FRB-3385 — Lab Sample ID: 320-35090-8

Date Collected: 01/15/18 09:35 — **Matrix: Water**
Date Received: 01/16/18 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			205981	01/29/18 12:24	KMK	TAL SAC
Total/NA	Analysis	537		1	206762	02/02/18 15:29	ABH	TAL SAC

Client Sample ID: WGNA-011518-DUP19 — Lab Sample ID: 320-35090-9

Date Collected: 01/15/18 07:00 — **Matrix: Water**
Date Received: 01/16/18 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			205981	01/29/18 12:24	KMK	TAL SAC
Total/NA	Analysis	537		1	206762	02/02/18 15:34	ABH	TAL SAC

Client Sample ID: NAWC-011518-RW-213 — Lab Sample ID: 320-35090-10

Date Collected: 01/15/18 10:10 — **Matrix: Water**
Date Received: 01/16/18 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			205981	01/29/18 12:24	KMK	TAL SAC
Total/NA	Analysis	537		1	206762	02/02/18 15:38	ABH	TAL SAC

Client Sample ID: NAWC-011518-FRB-213 — Lab Sample ID: 320-35090-11

Date Collected: 01/15/18 10:05 — **Matrix: Water**
Date Received: 01/16/18 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			205981	01/29/18 12:24	KMK	TAL SAC
Total/NA	Analysis	537		1	206762	02/02/18 15:43	ABH	TAL SAC

Client Sample ID: NAWC-011518-RW-215 — Lab Sample ID: 320-35090-12

Date Collected: 01/15/18 12:10 — **Matrix: Water**
Date Received: 01/16/18 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			205981	01/29/18 12:24	KMK	TAL SAC
Total/NA	Analysis	537		1	206762	02/02/18 15:48	ABH	TAL SAC

Lab Chronicle

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-35090-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Client Sample ID: NAWC-011518-FRB-215 Lab Sample ID: 320-35090-13

Date Collected: 01/15/18 12:05 **Matrix: Water**
Date Received: 01/16/18 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			205981	01/29/18 12:24	KMK	TAL SAC
Total/NA	Analysis	537		1	206762	02/02/18 15:53	ABH	TAL SAC

Client Sample ID: NAWC-011518-RW-48 Lab Sample ID: 320-35090-14

Date Collected: 01/15/18 13:10 **Matrix: Water**
Date Received: 01/16/18 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			205981	01/29/18 12:24	KMK	TAL SAC
Total/NA	Analysis	537		1	206762	02/02/18 15:57	ABH	TAL SAC

Client Sample ID: NAWC-011518-FRB-48 Lab Sample ID: 320-35090-15

Date Collected: 01/15/18 13:05 **Matrix: Water**
Date Received: 01/16/18 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			205981	01/29/18 12:24	KMK	TAL SAC
Total/NA	Analysis	537		1	206762	02/02/18 16:02	ABH	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: 320-35090-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	UST-055	01-20-21
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-18
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-18
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-18
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-18
Kansas	NELAP	7	E-10375	10-31-18
L-A-B	DoD ELAP		L2468	01-20-21
Louisiana	NELAP	6	30612	06-30-18
Maine	State Program	1	CA0004	04-14-18
Michigan	State Program	5	9947	01-31-18 *
Nevada	State Program	9	CA00044	07-31-18
New Hampshire	NELAP	1	2997	04-18-18
New Jersey	NELAP	2	CA005	06-30-18
New York	NELAP	2	11666	04-01-18
Oregon	NELAP	10	4040	01-29-20
Pennsylvania	NELAP	3	68-01272	03-31-18
Texas	NELAP	6	T104704399	05-31-18
US Fish & Wildlife	Federal		LE148388-0	07-31-18
USDA	Federal		P330-11-00436	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-18
Virginia	NELAP	3	460278	03-14-18
Washington	State Program	10	C581	05-05-18
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-35090-1
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: 320-35090-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-35090-1	NAWC-011518-RW-21	Water	01/15/18 08:10	01/16/18 10:15
320-35090-2	NAWC-011518-FRB-21	Water	01/15/18 08:05	01/16/18 10:15
320-35090-3	NAWC-011518-RW-233	Water	01/15/18 08:40	01/16/18 10:15
320-35090-4	NAWC-011518-FRB-233	Water	01/15/18 08:35	01/16/18 10:15
320-35090-5	NAWC-011518-RW-241	Water	01/15/18 09:10	01/16/18 10:15
320-35090-6	NAWC-011518-FRB-241	Water	01/15/18 09:05	01/16/18 10:15
320-35090-7	WGNA-011518-RW-3385	Water	01/15/18 09:40	01/16/18 10:15
320-35090-8	WGNA-011518-FRB-3385	Water	01/15/18 09:35	01/16/18 10:15
320-35090-9	WGNA-011518-DUP19	Water	01/15/18 07:00	01/16/18 10:15
320-35090-10	NAWC-011518-RW-213	Water	01/15/18 10:10	01/16/18 10:15
320-35090-11	NAWC-011518-FRB-213	Water	01/15/18 10:05	01/16/18 10:15
320-35090-12	NAWC-011518-RW-215	Water	01/15/18 12:10	01/16/18 10:15
320-35090-13	NAWC-011518-FRB-215	Water	01/15/18 12:05	01/16/18 10:15
320-35090-14	NAWC-011518-RW-48	Water	01/15/18 13:10	01/16/18 10:15
320-35090-15	NAWC-011518-FRB-48	Water	01/15/18 13:05	01/16/18 10:15

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

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.: 320-35090-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 206761

Lab Sample ID: CCVL 320-206761/1 Client Sample ID:

Date Analyzed: 02/02/18 14:10 Lab File ID: 2018.02.02_537A_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.12	User Assigned	phomsopha t	02/02/18 14:52

Lab Sample ID: CCV 320-206761/2 CCVIS Client Sample ID:

Date Analyzed: 02/02/18 14:14 Lab File ID: 2018.02.02_537A_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.12	Assign Peak	hannigana	02/06/18 13:25

Lab Sample ID: LLCS 320-205981/2-A Client Sample ID:

Date Analyzed: 02/02/18 14:38 Lab File ID: 2018.02.02_537A_010.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Assign Peak	hannigana	02/06/18 13:32

Lab Sample ID: LLCSD 320-205981/3-A Client Sample ID:

Date Analyzed: 02/02/18 14:42 Lab File ID: 2018.02.02_537A_011.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Assign Peak	hannigana	02/06/18 13:33

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 206761

Lab Sample ID: 320-35090-1 Client Sample ID: NAWC-011518-RW-21

Date Analyzed: 02/02/18 14:47 Lab File ID: 2018.02.02_537A_012.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.38	Assign Peak	hannigana	02/06/18 13:34
Perfluorooctanesulfonic acid (PFOS)	2.10	Assign Peak	hannigana	02/06/18 13:34

Lab Sample ID: 320-35090-3 Client Sample ID: NAWC-011518-RW-233

Date Analyzed: 02/02/18 14:56 Lab File ID: 2018.02.02_537A_014.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.37	Assign Peak	hannigana	02/06/18 13:35
Perfluorooctanesulfonic acid (PFOS)	2.09	Assign Peak	hannigana	02/06/18 13:36
Perfluorononanoic acid (PFNA)	2.10	Assign Peak	hannigana	02/06/18 13:36

Lab Sample ID: 320-35090-5 Client Sample ID: NAWC-011518-RW-241

Date Analyzed: 02/02/18 15:06 Lab File ID: 2018.02.02_537A_016.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.09	Assign Peak	hannigana	02/06/18 13:37
Perfluorononanoic acid (PFNA)	2.10	Assign Peak	hannigana	02/06/18 13:37

Lab Sample ID: CCV 320-206761/14 CCVIS Client Sample ID:

Date Analyzed: 02/02/18 15:10 Lab File ID: 2018.02.02_537A_017.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.09	Assign Peak	hannigana	02/06/18 13:38

537

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 206762

Lab Sample ID: CCV 320-206762/14 CCVIS Client Sample ID:

Date Analyzed: 02/02/18 15:10 Lab File ID: 2018.02.02_537A_017.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.09	Assign Peak	hannigana	02/06/18 13:38

Lab Sample ID: 320-35090-7 Client Sample ID: WGNA-011518-RW-3385

Date Analyzed: 02/02/18 15:24 Lab File ID: 2018.02.02_537A_020.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.37	Assign Peak	hannigana	02/06/18 13:38
Perfluorononanoic acid (PFNA)	2.09	Assign Peak	hannigana	02/06/18 13:39
Perfluorooctanesulfonic acid (PFOS)	2.09	Assign Peak	hannigana	02/06/18 13:39

Lab Sample ID: 320-35090-9 Client Sample ID: WGNA-011518-DUP19

Date Analyzed: 02/02/18 15:34 Lab File ID: 2018.02.02_537A_022.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.09	Assign Peak	hannigana	02/06/18 13:39
Perfluorononanoic acid (PFNA)	2.10	Assign Peak	hannigana	02/06/18 13:39

Lab Sample ID: 320-35090-10 Client Sample ID: NAWC-011518-RW-213

Date Analyzed: 02/02/18 15:38 Lab File ID: 2018.02.02_537A_023.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.09	Assign Peak	hannigana	02/06/18 13:41

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 206762

Lab Sample ID: 320-35090-12 Client Sample ID: NAWC-011518-RW-215

Date Analyzed: 02/02/18 15:48 Lab File ID: 2018.02.02_537A_025.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.09	Assign Peak	hannigana	02/06/18 13:42
Perfluorononanoic acid (PFNA)	2.10	Assign Peak	hannigana	02/06/18 13:43

Lab Sample ID: 320-35090-14 Client Sample ID: NAWC-011518-RW-48

Date Analyzed: 02/02/18 15:57 Lab File ID: 2018.02.02_537A_027.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.37	Assign Peak	hannigana	02/06/18 13:43
Perfluorooctanesulfonic acid (PFOS)	1.99	Assign Peak	hannigana	02/06/18 13:44

Lab Sample ID: CCV 320-206762/26 CCVIS Client Sample ID:

Date Analyzed: 02/02/18 16:07 Lab File ID: 2018.02.02_537A_029.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.08	Assign Peak	hannigana	02/06/18 13:49

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
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
..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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..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_00055	05/27/18	11/27/17	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-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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
....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-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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

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-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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2 PFHxA	10 ng/mL
.LC537-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
.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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
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
							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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC537-PFOS_00008	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-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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
....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-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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	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-LSP_00025	02/10/18	08/10/17	Methanol, Lot 090285	20000 uL	LC537SPIM_00023	50 uL	Perfluorobutane Sulfonate	225 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	225 ng/mL
							Perfluoroheptanoic acid (PFHpA)	25.0041 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	75.0109 ng/mL
							Perfluorononanoic acid (PFNA)	50.0049 ng/mL
							Perfluorooctanoic acid (PFOA)	50.0378 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	100.016 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-SU_00055	05/27/18	11/27/17	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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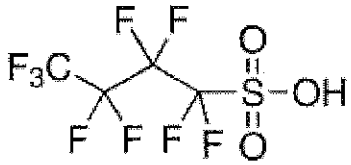
Website: www.sigmaaldrich.com
Email USA: techserv@sial.com
Outside USA: eurtechserv@sial.com

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

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

Purity = 90.94 / w/m.w correction

SKV 4/1/15

Reagent

LC537_PFHxS2_00002

n: 6.8.17 SKV

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 $\frac{PFHxS}{Cas\# 355\text{-}46\text{-}4}$

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

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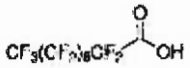
Outside USA: eurtechserv@sial.com

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

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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

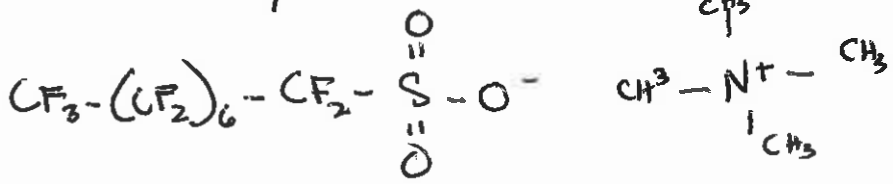
TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	WHITE TO OFF WHITE	OFF-WHITE
APPEARANCE (FORM)	POWDER OR POWDER WITH CHUNK(S)	POWDER
CARBON CONTENT	29.77 % - 31.29 %	29.97 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

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

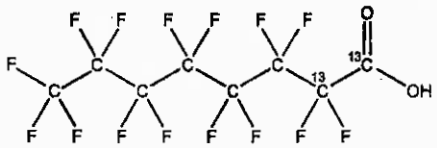
LCM2PFOA_00007

P: 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:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

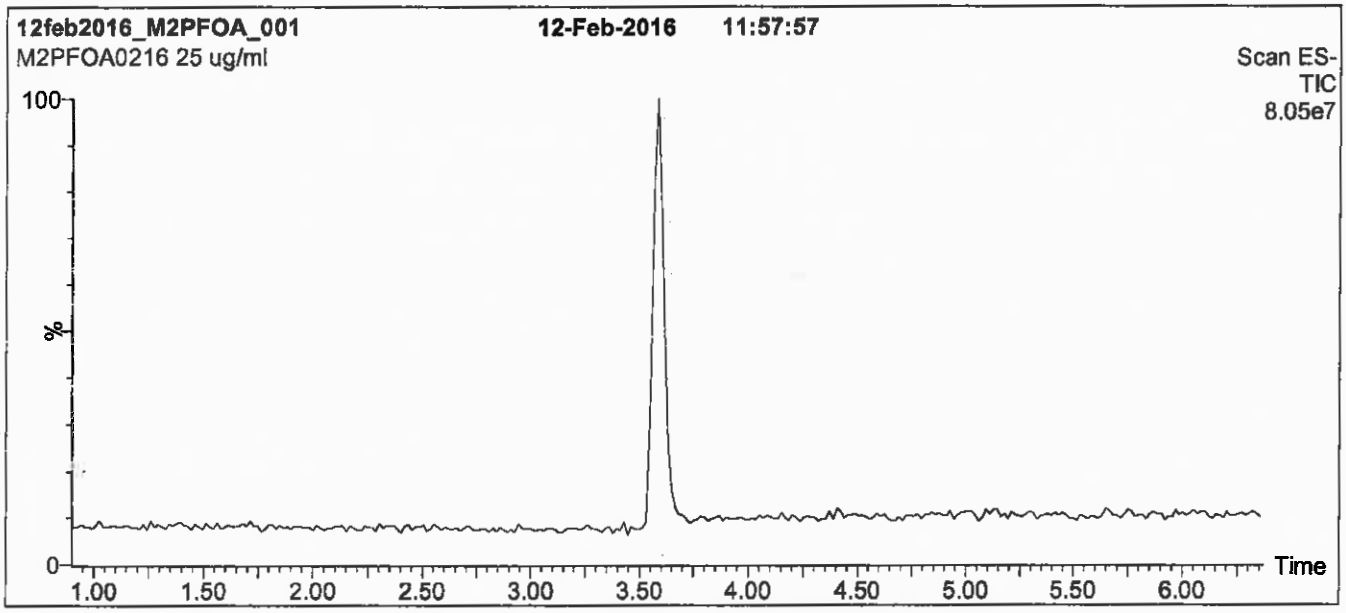
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

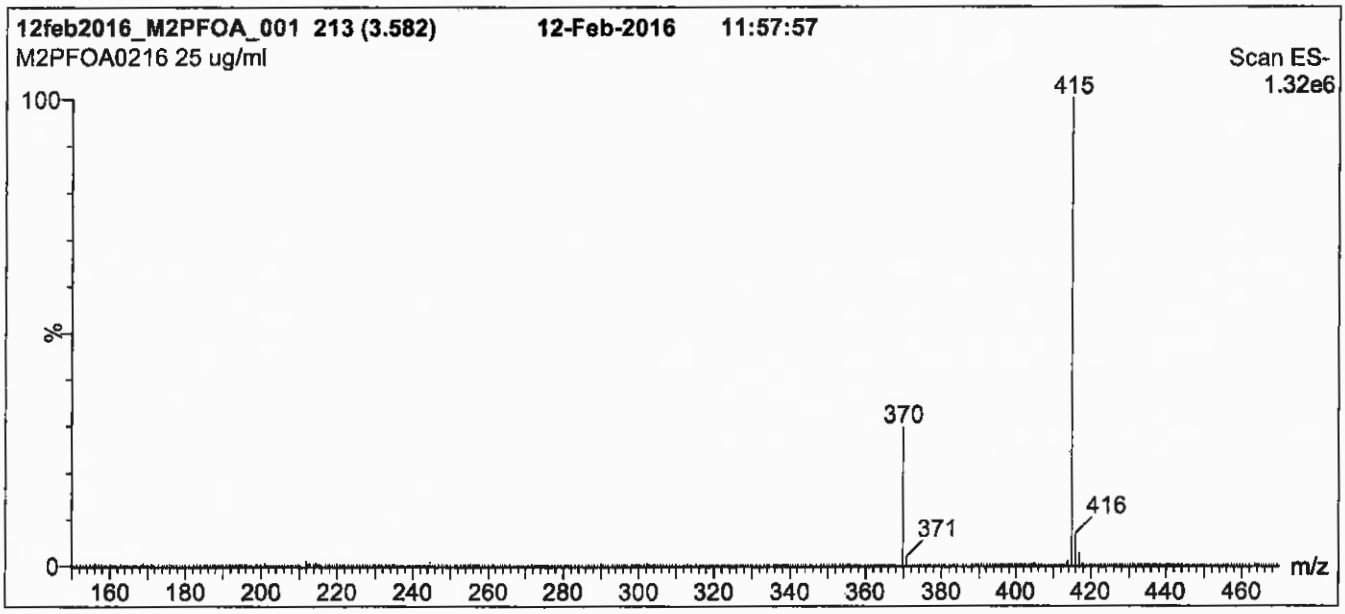
CALA

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

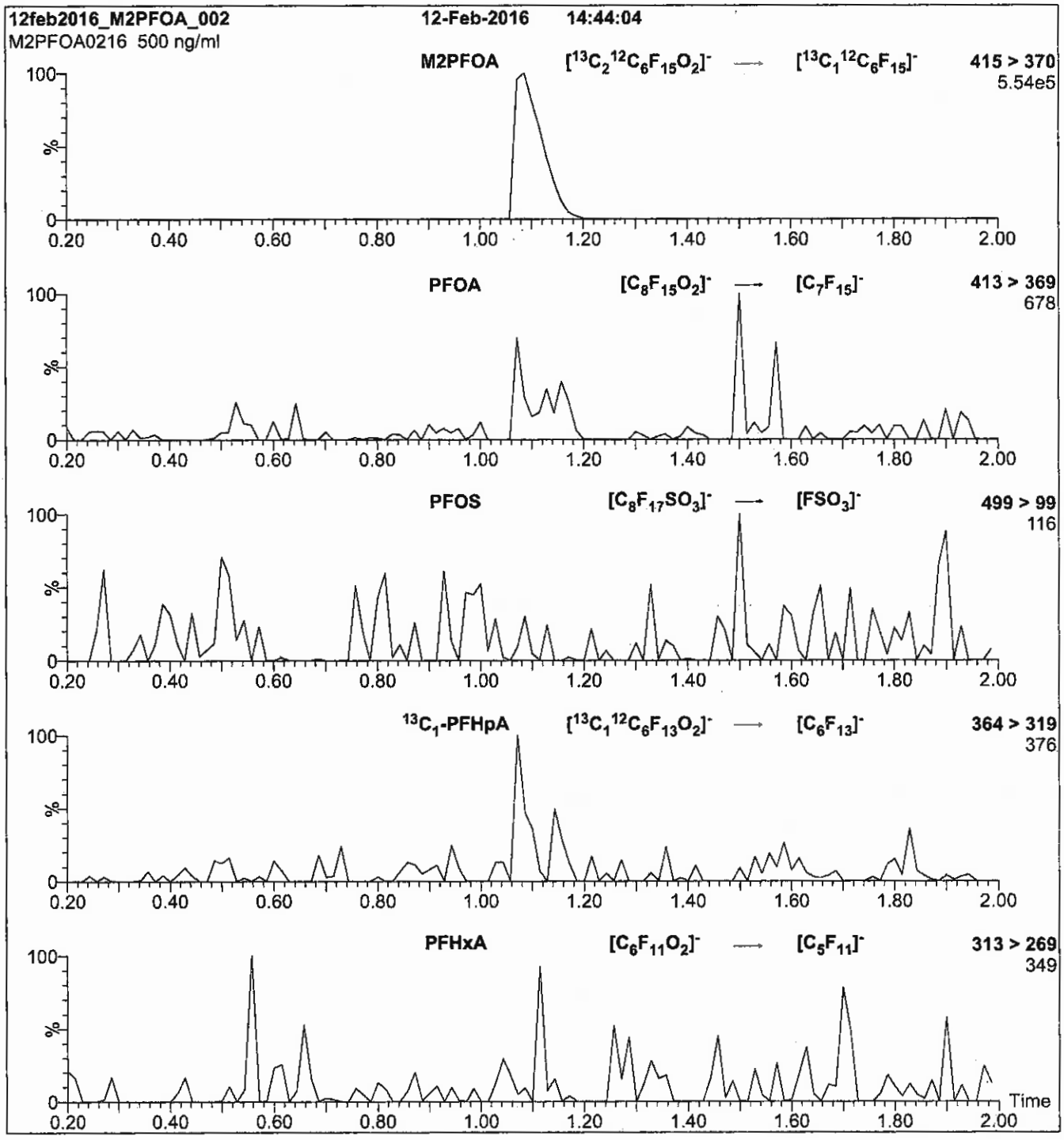
Flow: 300 µl/min

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:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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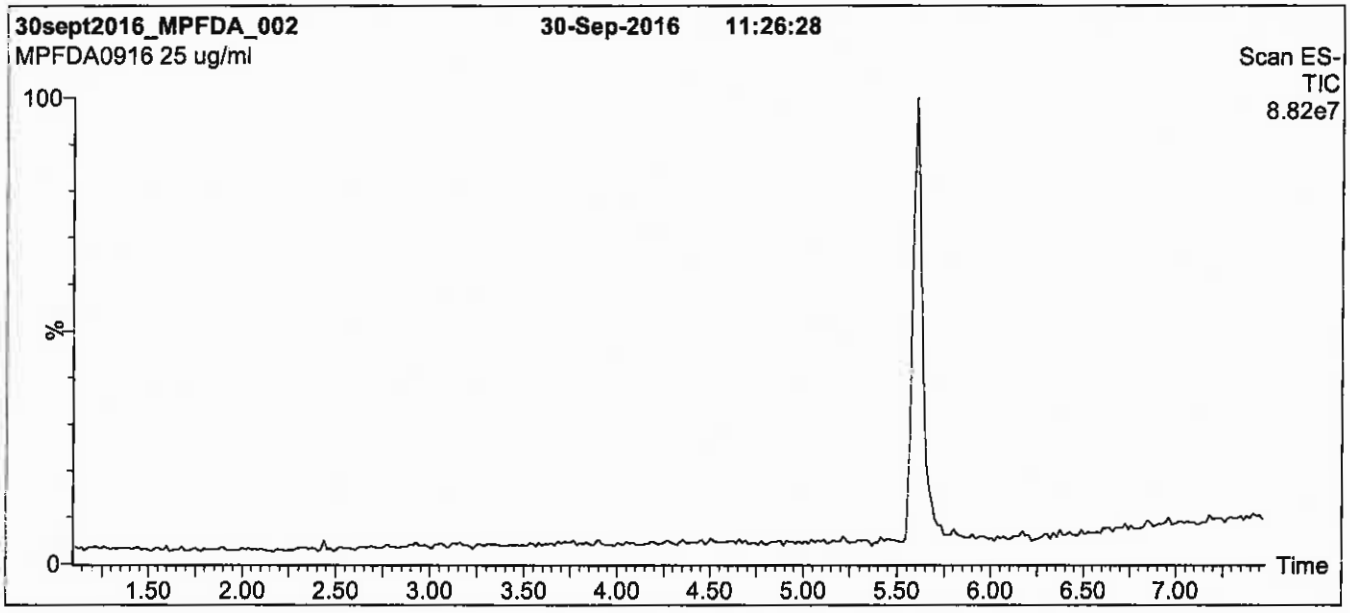
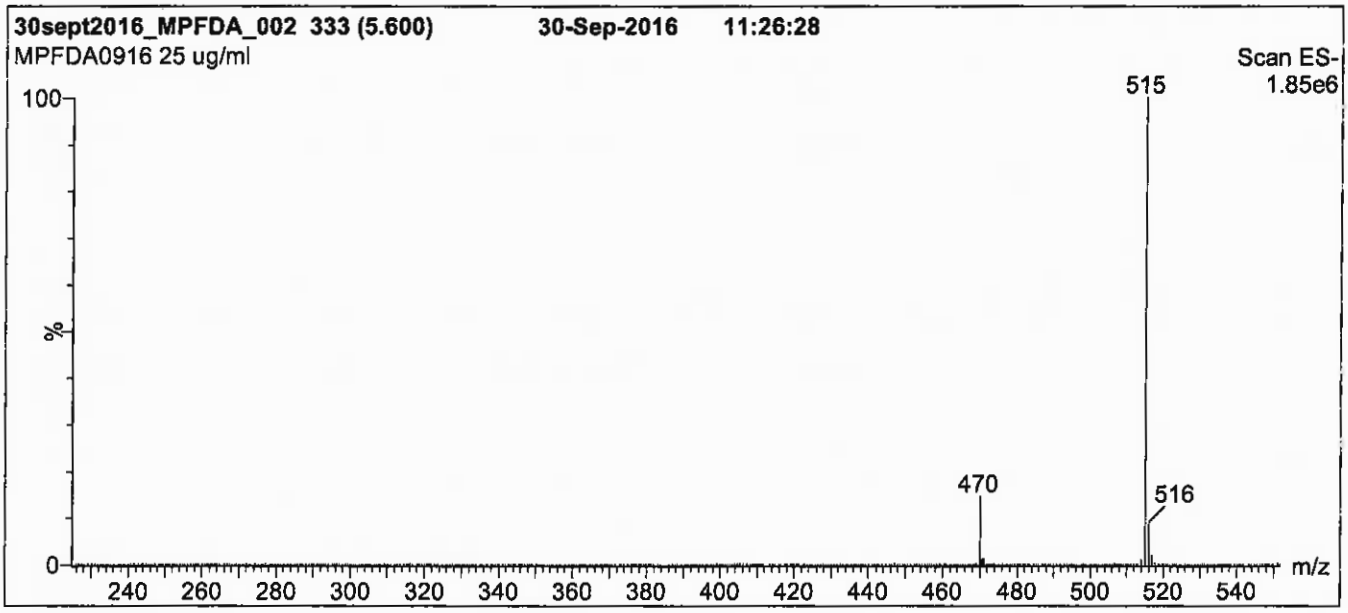
QUALITY MANAGEMENT:

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

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

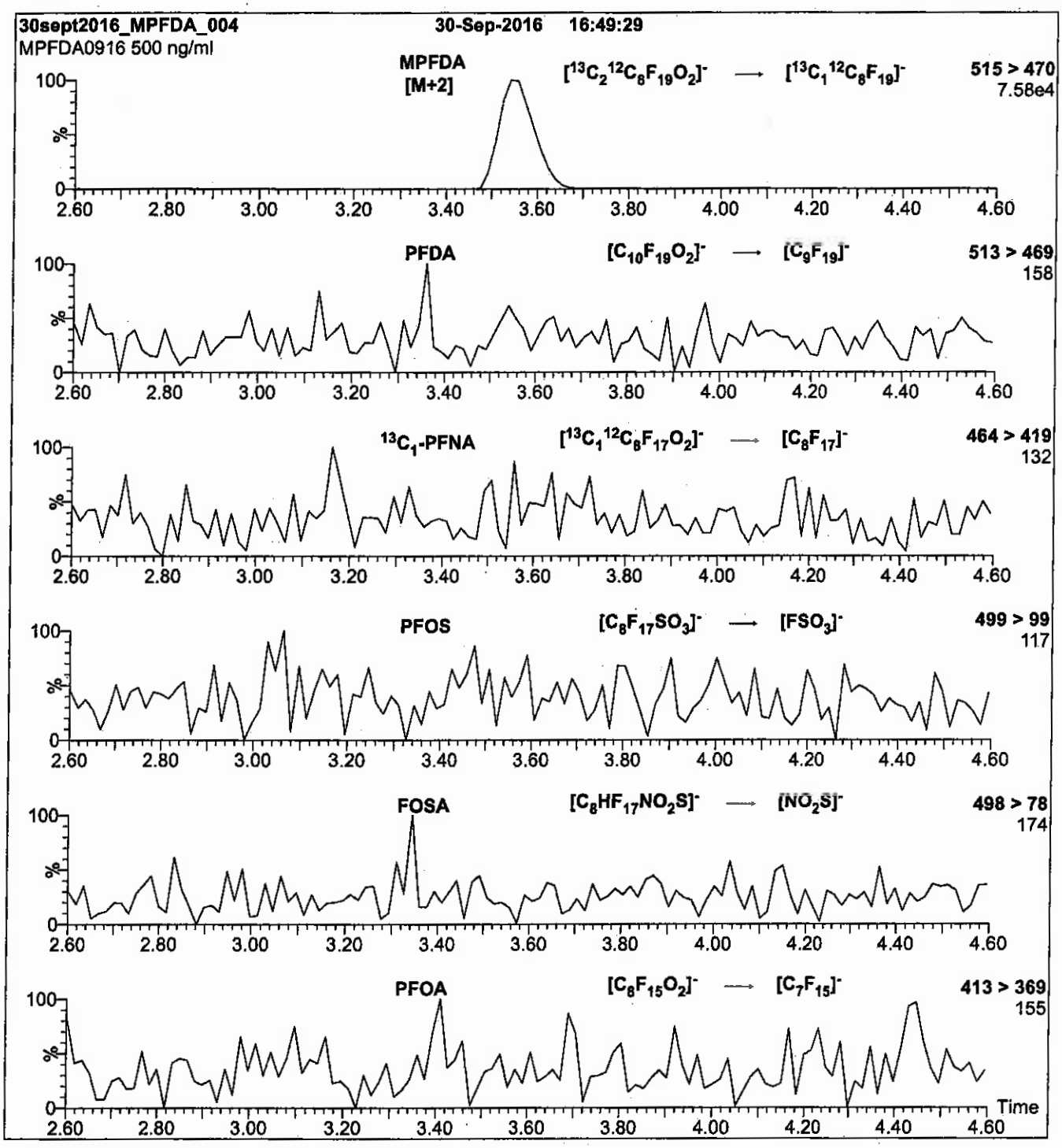
Flow: 300 µl/min

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

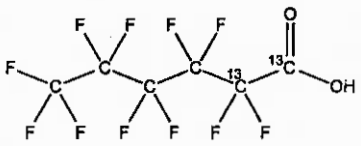
R: SBC 12/21/16

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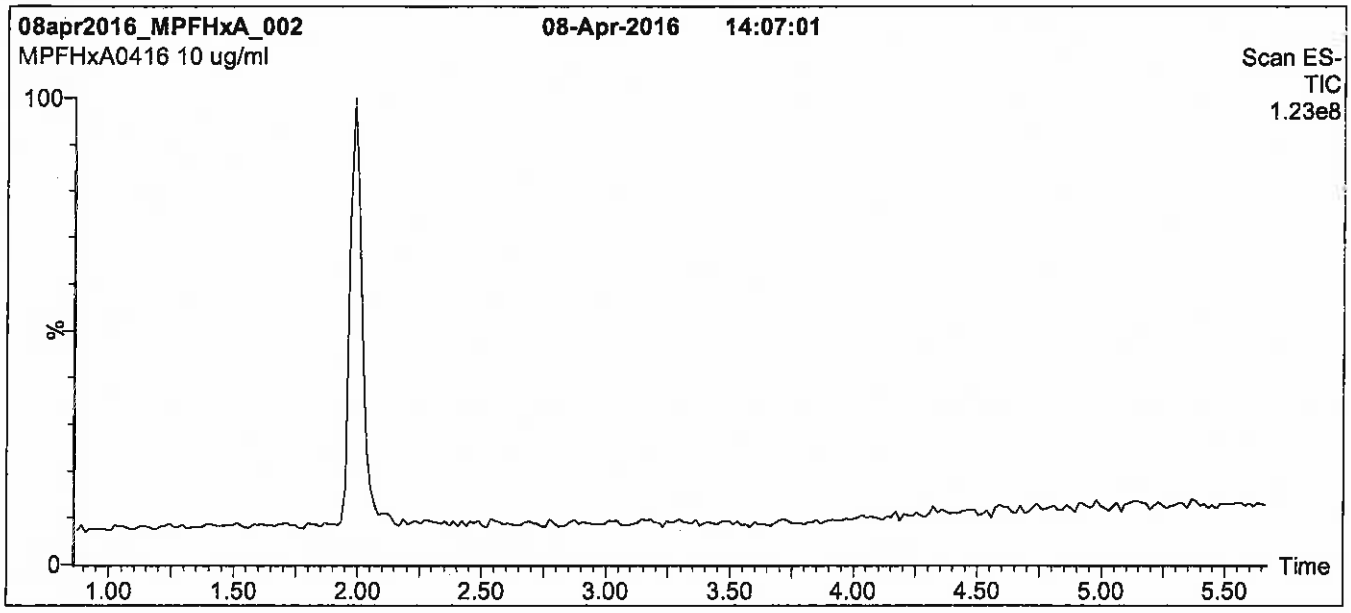
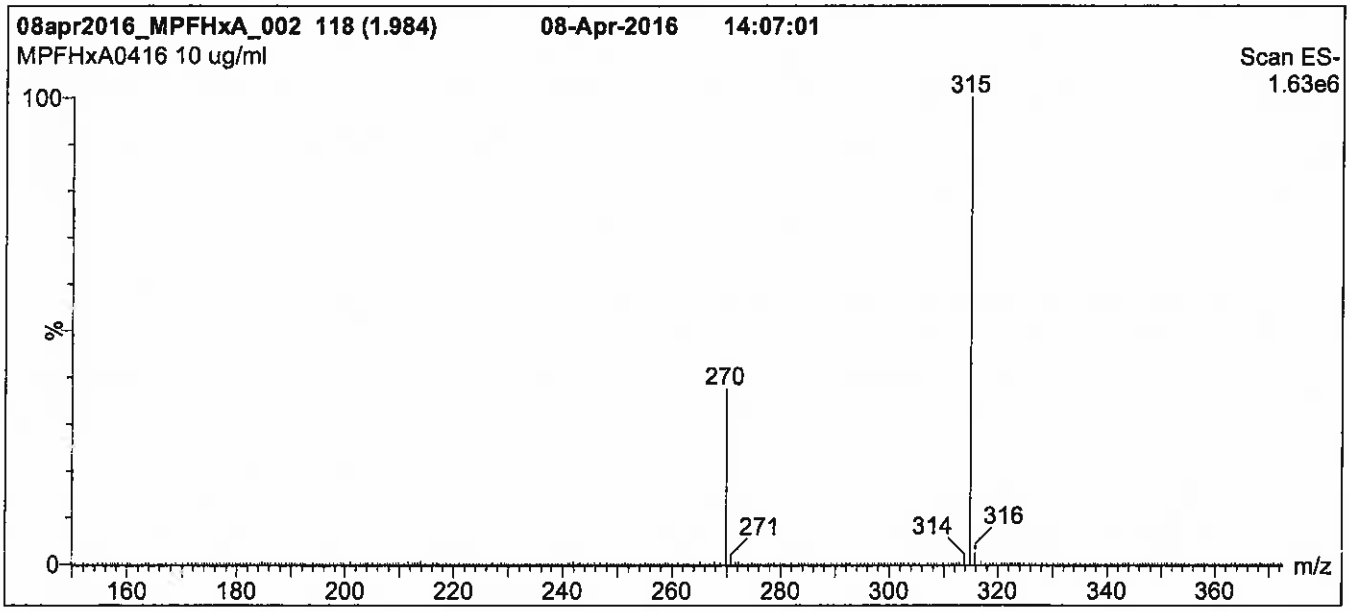
Figure 1: **MPFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

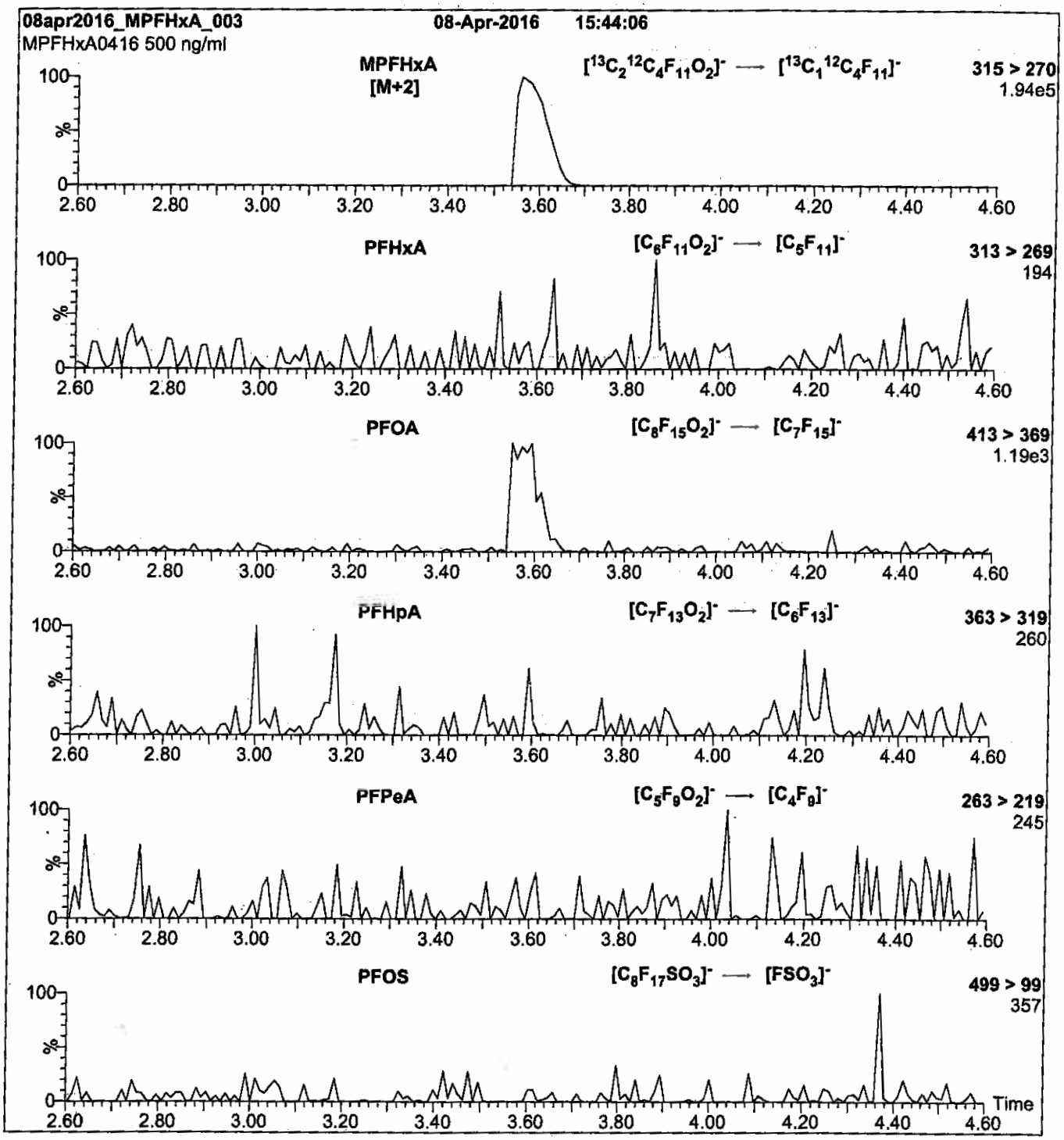
Flow: 300 µl/min

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

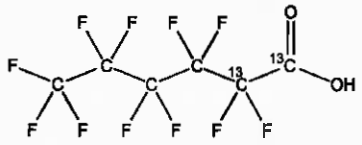
LCMPFHxA_00015

Rec: 5/8/17 Std

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFHxA	**LOT NUMBER:**	MPFHxA1116
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-$^{13}C_2$)
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		

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:** 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:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

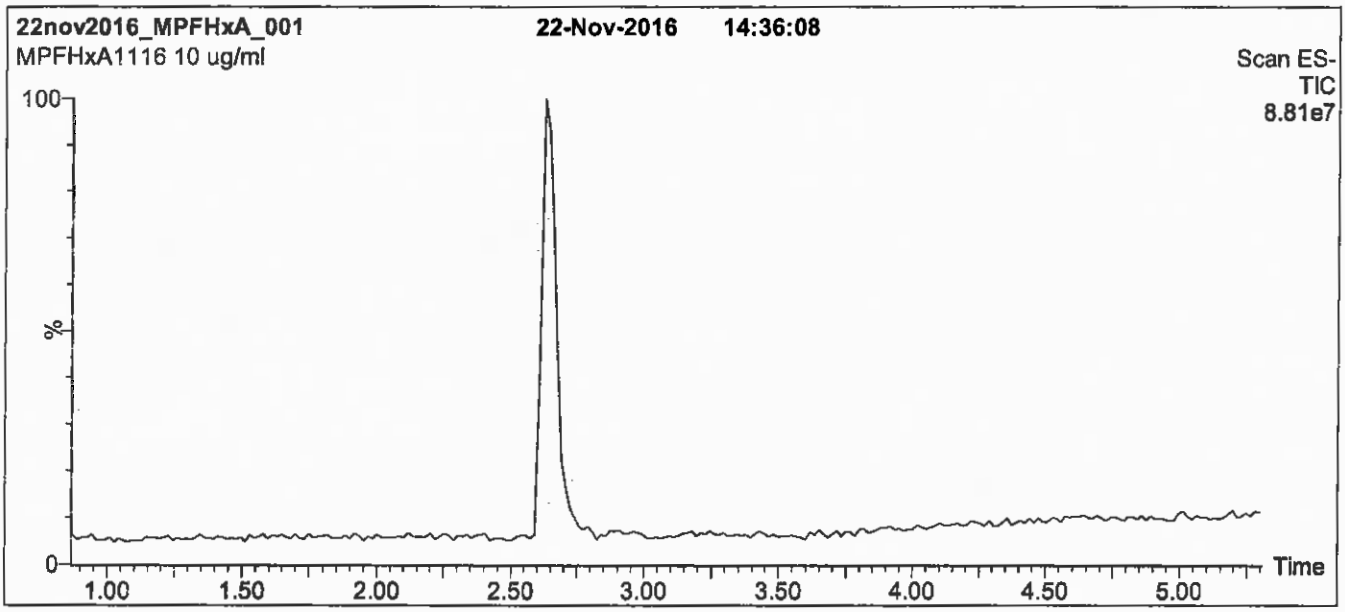
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

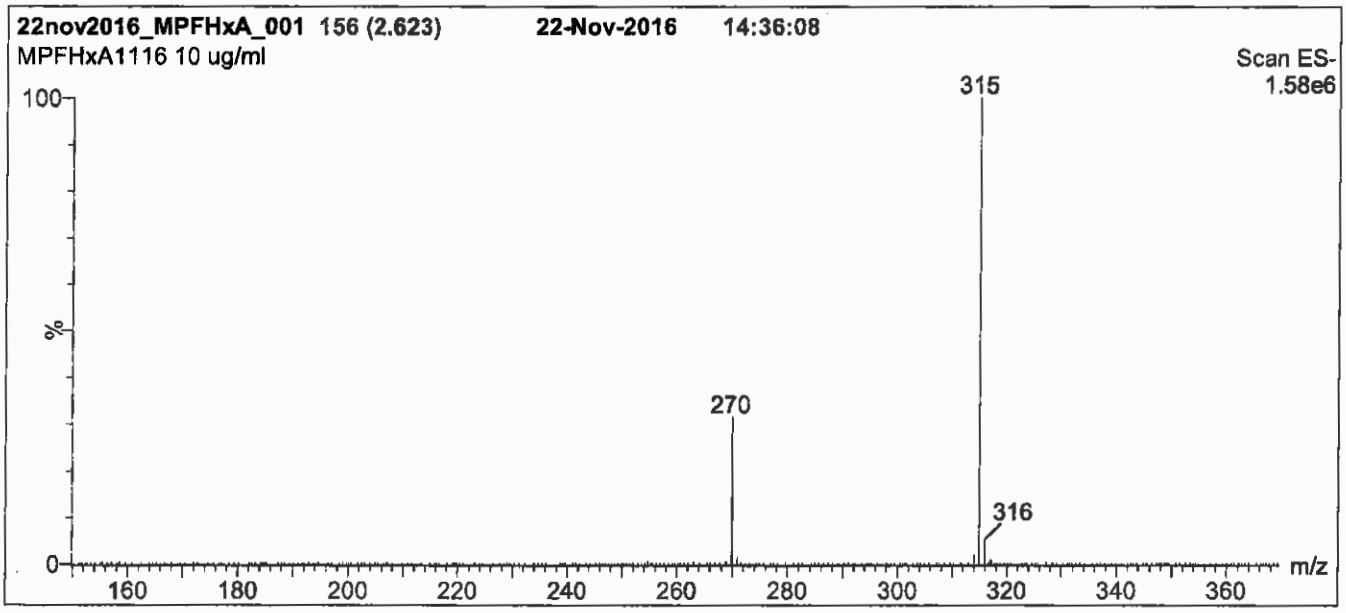
CALA

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

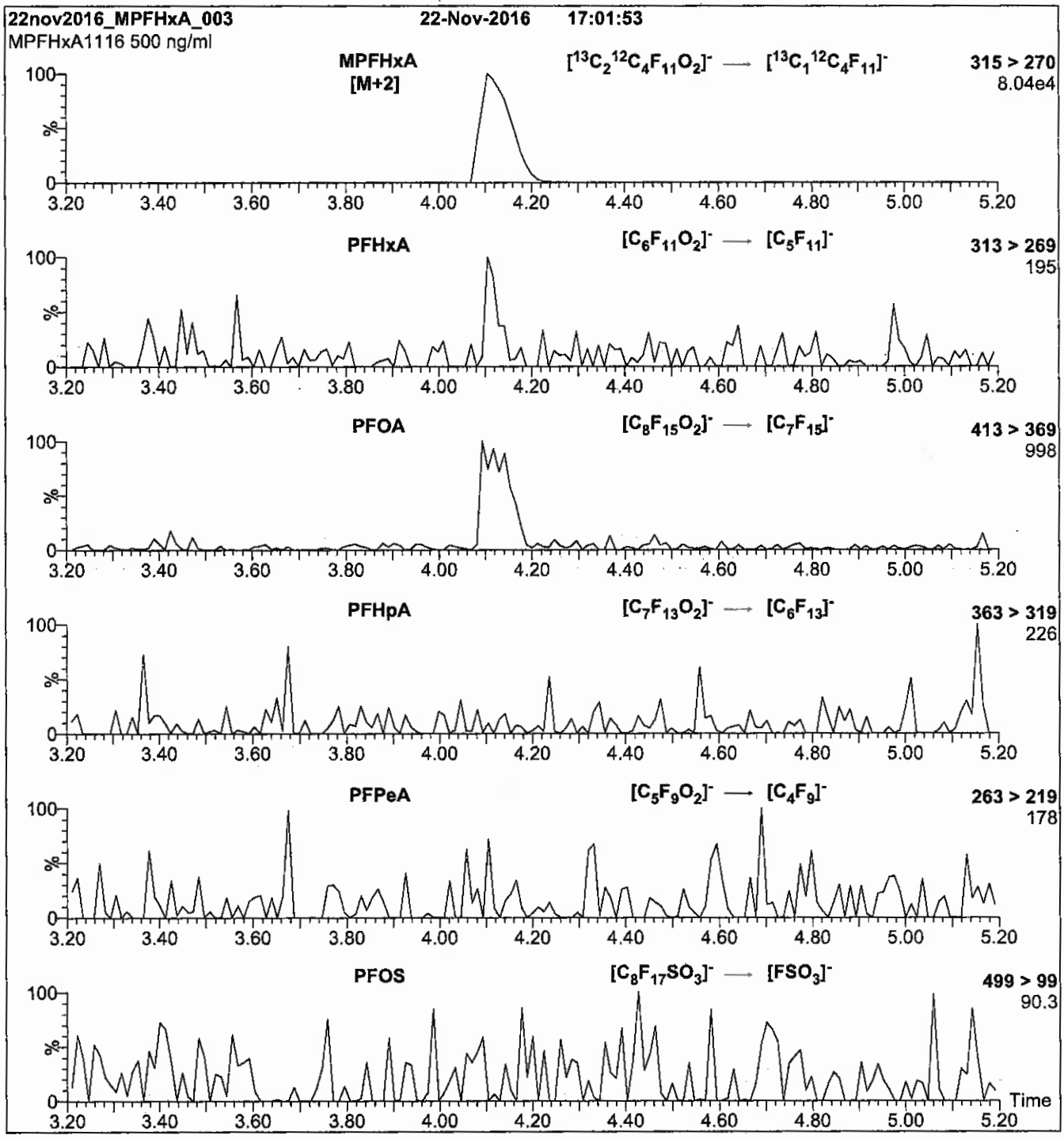
Flow: 300 µl/min

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

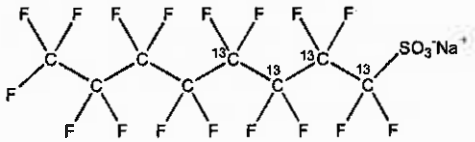
WELLINGTON LABORATORIES

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:

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HAZARDS:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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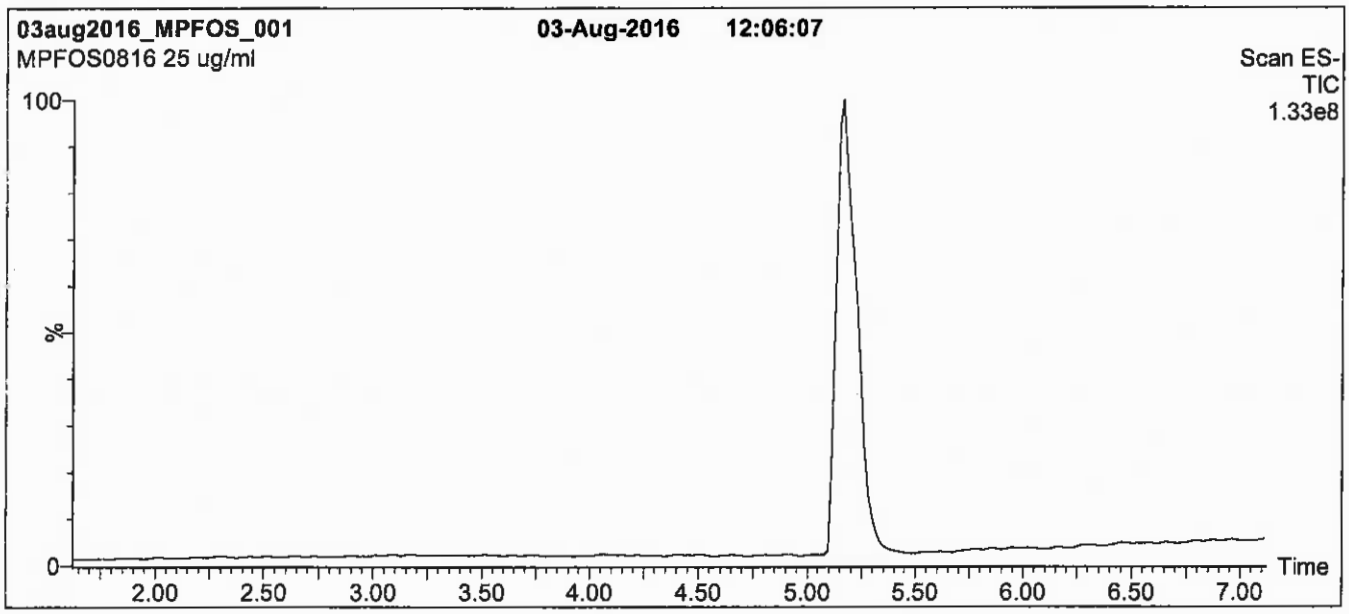
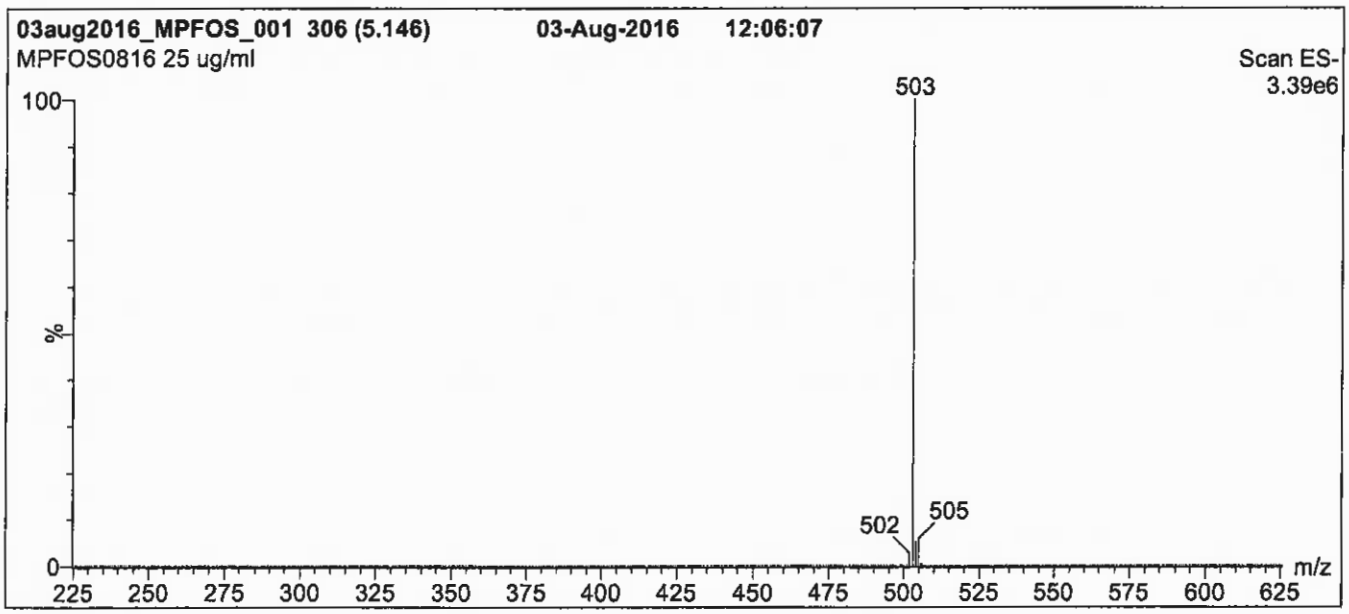
Figure 1: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{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

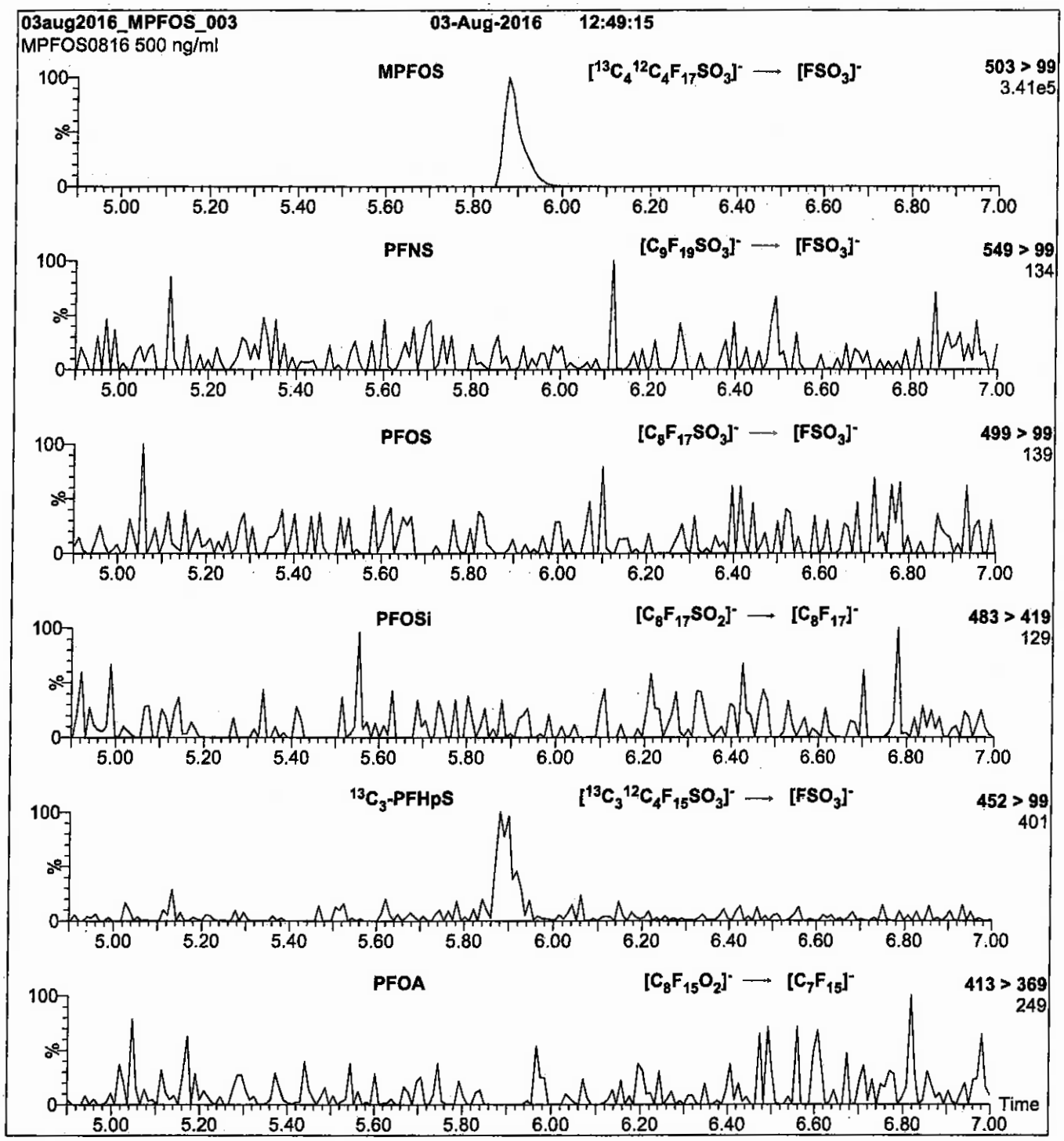
Flow: 300 µl/min

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

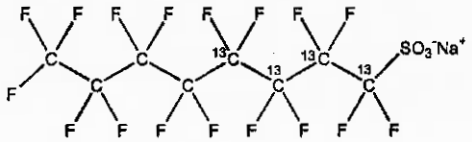
WELLINGTON LABORATORIES

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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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		

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- 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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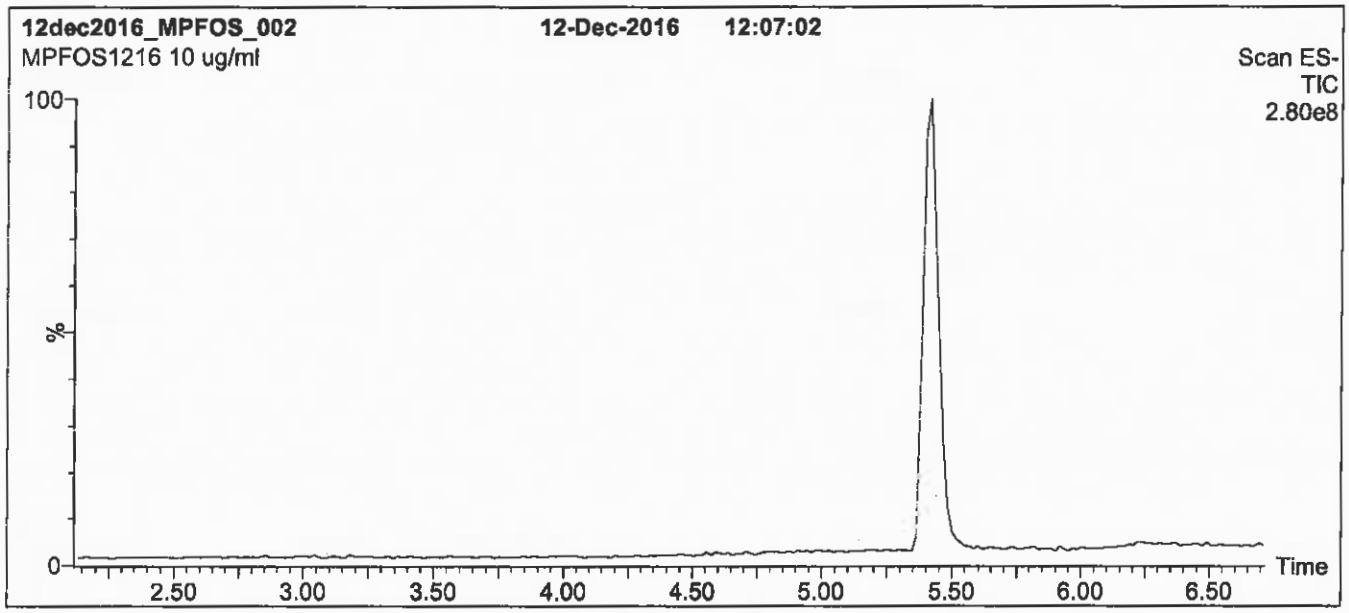

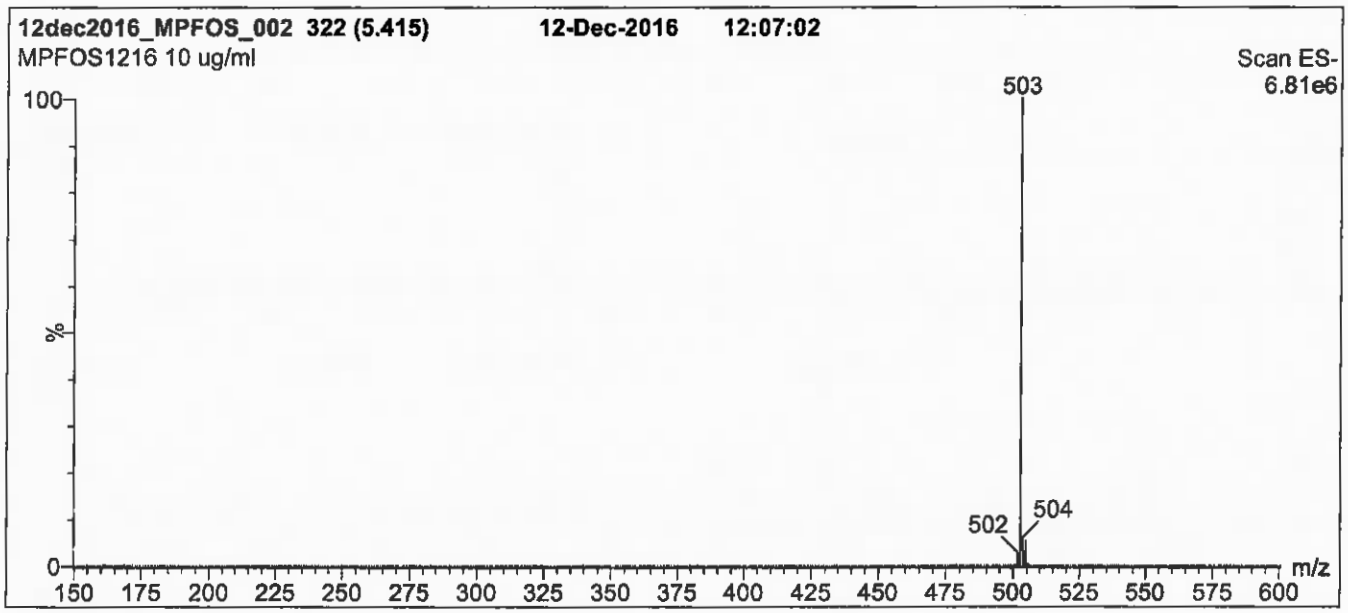

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MS: **Micromass Quattro *micro* API MS**

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Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
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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

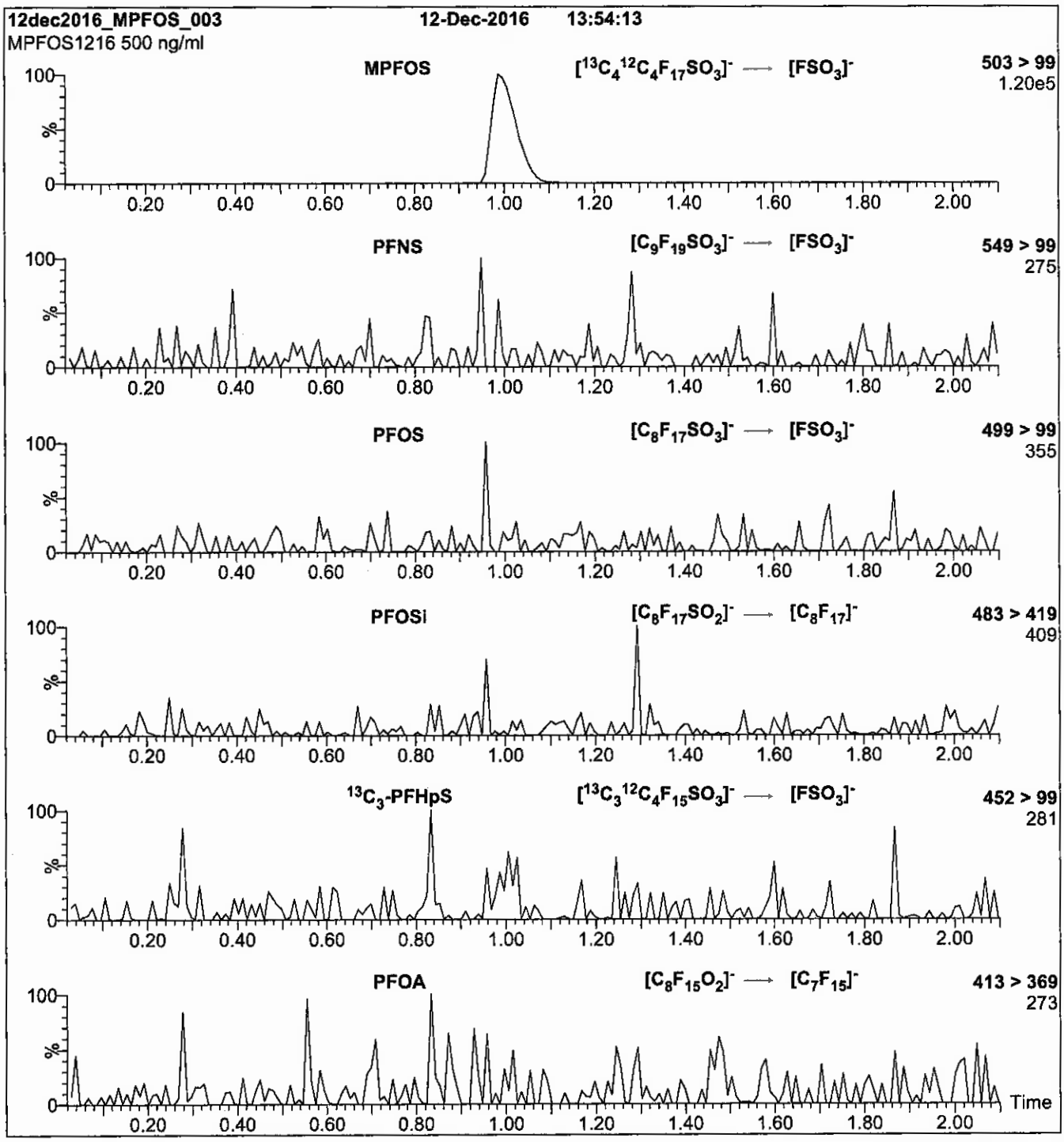
Flow: 300 µl/min

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.: 320-35090-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-011518-RW-21	320-35090-1	103	105
NAWC-011518-FRB-21	320-35090-2	105	110
NAWC-011518-RW-233	320-35090-3	97	99
NAWC-011518-FRB-233	320-35090-4	106	106
NAWC-011518-RW-241	320-35090-5	103	107
NAWC-011518-FRB-241	320-35090-6	103	117
WGNA-011518-RW-3385	320-35090-7	106	105
WGNA-011518-FRB-3385	320-35090-8	102	98
WGNA-011518-DUP19	320-35090-9	103	110
NAWC-011518-RW-213	320-35090-10	102	110
NAWC-011518-FRB-213	320-35090-11	100	110
NAWC-011518-RW-215	320-35090-12	101	109
NAWC-011518-FRB-215	320-35090-13	100	118
NAWC-011518-RW-48	320-35090-14	96	107
NAWC-011518-FRB-48	320-35090-15	107	111
	MB 320-205981/1-A	105	113
	LLCS 320-205981/2-A	107	113
	LLCSD 320-205981/3-A	110	115

	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 LOW LEVEL CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.02.02_537A_010.d

Lab ID: LLCS 320-205981/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LLCS CONCENTRATION (ng/L)	LLCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	40.0	41.0	102	50-150	M
Perfluorooctanoic acid (PFOA)	20.0	21.1	105	50-150	
Perfluorononanoic acid (PFNA)	20.0	20.9 J	105	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.0	33.4	111	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	11.3	113	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.0	99.0	110	50-150	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LOW LEVEL CONTROL STANDARD DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.02.02_537A_011.d

Lab ID: LLCSD 320-205981/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LLCSD CONCENTRATION (ng/L)	LLCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	40.0	39.4 J	98	4	50	50-150	M
Perfluorooctanoic acid (PFOA)	20.0	20.8	104	2	50	50-150	
Perfluorononanoic acid (PFNA)	20.0	20.6 J	103	2	50	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.0	31.9	106	5	50	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	11.2	112	1	50	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.0	91.9	102	7	50	50-150	

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.: 320-35090-1

SDG No.:

Lab File ID: 2018.02.02_537A_009.d Lab Sample ID: MB 320-205981/1-A

Matrix: Water Date Extracted: 01/29/2018 12:24

Instrument ID: A8_N Date Analyzed: 02/02/2018 14:33

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LLCS 320-205981/2-A	2018.02.02_537A_010.d	02/02/2018 14:38
	LLCSD 320-205981/3-A	2018.02.02_537A_011.d	02/02/2018 14:42
NAWC-011518-RW-21	320-35090-1	2018.02.02_537A_012.d	02/02/2018 14:47
NAWC-011518-FRB-21	320-35090-2	2018.02.02_537A_013.d	02/02/2018 14:52
NAWC-011518-RW-233	320-35090-3	2018.02.02_537A_014.d	02/02/2018 14:56
NAWC-011518-FRB-233	320-35090-4	2018.02.02_537A_015.d	02/02/2018 15:01
NAWC-011518-RW-241	320-35090-5	2018.02.02_537A_016.d	02/02/2018 15:06
NAWC-011518-FRB-241	320-35090-6	2018.02.02_537A_019.d	02/02/2018 15:20
WGNA-011518-RW-3385	320-35090-7	2018.02.02_537A_020.d	02/02/2018 15:24
WGNA-011518-FRB-3385	320-35090-8	2018.02.02_537A_021.d	02/02/2018 15:29
WGNA-011518-DUP19	320-35090-9	2018.02.02_537A_022.d	02/02/2018 15:34
NAWC-011518-RW-213	320-35090-10	2018.02.02_537A_023.d	02/02/2018 15:38
NAWC-011518-FRB-213	320-35090-11	2018.02.02_537A_024.d	02/02/2018 15:43
NAWC-011518-RW-215	320-35090-12	2018.02.02_537A_025.d	02/02/2018 15:48
NAWC-011518-FRB-215	320-35090-13	2018.02.02_537A_026.d	02/02/2018 15:53
NAWC-011518-RW-48	320-35090-14	2018.02.02_537A_027.d	02/02/2018 15:57
NAWC-011518-FRB-48	320-35090-15	2018.02.02_537A_028.d	02/02/2018 16:02

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

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 320-206761/1		1655390	1.87	3269547	2.12		
CCV 320-206761/2 CCVIS		1656526	1.86	3231012	2.12		
MB 320-205981/1-A		1333051	1.85	3005290	2.11		
LLCS 320-205981/2-A		1347572	1.84	3064104	2.10		
LLCSD 320-205981/3-A		1334476	1.84	3061885	2.09		
320-35090-1	NAWC-011518-RW-21	1402398	1.84	3002549	2.10		
320-35090-2	NAWC-011518-FRB-21	1400952	1.84	3069663	2.09		
320-35090-3	NAWC-011518-RW-233	1517070	1.84	3154398	2.09		
320-35090-4	NAWC-011518-FRB-233	1379723	1.84	3086428	2.09		
320-35090-5	NAWC-011518-RW-241	1413224	1.84	3132065	2.09		
CCV 320-206761/14 CCVIS		1553440	1.84	3198528	2.09		
CCV 320-206762/14 CCVIS		1553440	1.84	3198528	2.09		
320-35090-6	NAWC-011518-FRB-241	1381690	1.84	3202154	2.09		
320-35090-7	WGNA-011518-RW-3385	1395726	1.83	3215283	2.09		
320-35090-8	WGNA-011518-FRB-3385	1471505	1.83	3214406	2.09		
320-35090-9	WGNA-011518-DUP19	1425511	1.84	3169341	2.09		
320-35090-10	NAWC-011518-RW-213	1399237	1.83	3165894	2.09		
320-35090-11	NAWC-011518-FRB-213	1477701	1.84	3257549	2.09		
320-35090-12	NAWC-011518-RW-215	1445838	1.84	3081289	2.09		
320-35090-13	NAWC-011518-FRB-215	1398357	1.83	3172443	2.08		
320-35090-14	NAWC-011518-RW-48	1453041	1.83	3202843	2.08		
320-35090-15	NAWC-011518-FRB-48	1416442	1.83	3166785	2.09		
CCV 320-206762/26 CCVIS		1462471	1.83	3102658	2.08		

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.: 320-35090-1

SDG No.:

Sample No.: CCV 320-206761/2 Date Analyzed: 02/02/2018 14:14

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

Lab File ID (Standard): 2018.02.02_537A_005 Heated Purge: (Y/N) N

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1656526	1.86	3231012	2.12		
UPPER LIMIT		2319136	2.36	4523417	2.62		
LOWER LIMIT		1159568	1.36	2261708	1.62		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-205981/1-A		1333051	1.85	3005290	2.11		
LLCS 320-205981/2-A		1347572	1.84	3064104	2.10		
LLCSD 320-205981/3-A		1334476	1.84	3061885	2.09		
320-35090-1	NAWC-011518-RW-21	1402398	1.84	3002549	2.10		
320-35090-2	NAWC-011518-FRB-21	1400952	1.84	3069663	2.09		
320-35090-3	NAWC-011518-RW-233	1517070	1.84	3154398	2.09		
320-35090-4	NAWC-011518-FRB-233	1379723	1.84	3086428	2.09		
320-35090-5	NAWC-011518-RW-241	1413224	1.84	3132065	2.09		

13PFOA = 13C2-PFOA
13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS
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.: 320-35090-1

SDG No.:

Sample No.: CCV 320-206761/14 Date Analyzed: 02/02/2018 15:10

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

Lab File ID (Standard): 2018.02.02_537A_017 Heated Purge: (Y/N) N

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1553440	1.84	3198528	2.09		
UPPER LIMIT		2174816	2.34	4477939	2.59		
LOWER LIMIT		1087408	1.34	2238970	1.59		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-205981/1-A		1333051	1.85	3005290	2.11		
LLCS 320-205981/2-A		1347572	1.84	3064104	2.10		
LLCSD 320-205981/3-A		1334476	1.84	3061885	2.09		
320-35090-1	NAWC-011518-RW-21	1402398	1.84	3002549	2.10		
320-35090-2	NAWC-011518-FRB-21	1400952	1.84	3069663	2.09		
320-35090-3	NAWC-011518-RW-233	1517070	1.84	3154398	2.09		
320-35090-4	NAWC-011518-FRB-233	1379723	1.84	3086428	2.09		
320-35090-5	NAWC-011518-RW-241	1413224	1.84	3132065	2.09		

13PFOA = 13C2-PFOA
13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS
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.: 320-35090-1

SDG No.:

Sample No.: CCV 320-206762/14 Date Analyzed: 02/02/2018 15:10

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

Lab File ID (Standard): 2018.02.02_537A_017 Heated Purge: (Y/N) N

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1553440	1.84	3198528	2.09		
UPPER LIMIT		2174816	2.34	4477939	2.59		
LOWER LIMIT		1087408	1.34	2238970	1.59		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-35090-6	NAWC-011518-FRB-241	1381690	1.84	3202154	2.09		
320-35090-7	WGNA-011518-RW-3385	1395726	1.83	3215283	2.09		
320-35090-8	WGNA-011518-FRB-3385	1471505	1.83	3214406	2.09		
320-35090-9	WGNA-011518-DUP19	1425511	1.84	3169341	2.09		
320-35090-10	NAWC-011518-RW-213	1399237	1.83	3165894	2.09		
320-35090-11	NAWC-011518-FRB-213	1477701	1.84	3257549	2.09		
320-35090-12	NAWC-011518-RW-215	1445838	1.84	3081289	2.09		
320-35090-13	NAWC-011518-FRB-215	1398357	1.83	3172443	2.08		
320-35090-14	NAWC-011518-RW-48	1453041	1.83	3202843	2.08		
320-35090-15	NAWC-011518-FRB-48	1416442	1.83	3166785	2.09		

13PFOA = 13C2-PFOA
13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS
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.: 320-35090-1

SDG No.:

Sample No.: CCV 320-206762/26 Date Analyzed: 02/02/2018 16:07

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

Lab File ID (Standard): 2018.02.02_537A_029 Heated Purge: (Y/N) N

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1462471	1.83	3102658	2.08		
UPPER LIMIT		2047459	2.33	4343721	2.58		
LOWER LIMIT		1023730	1.33	2171861	1.58		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-35090-6	NAWC-011518-FRB-241	1381690	1.84	3202154	2.09		
320-35090-7	WGNA-011518-RW-3385	1395726	1.83	3215283	2.09		
320-35090-8	WGNA-011518-FRB-3385	1471505	1.83	3214406	2.09		
320-35090-9	WGNA-011518-DUP19	1425511	1.84	3169341	2.09		
320-35090-10	NAWC-011518-RW-213	1399237	1.83	3165894	2.09		
320-35090-11	NAWC-011518-FRB-213	1477701	1.84	3257549	2.09		
320-35090-12	NAWC-011518-RW-215	1445838	1.84	3081289	2.09		
320-35090-13	NAWC-011518-FRB-215	1398357	1.83	3172443	2.08		
320-35090-14	NAWC-011518-RW-48	1453041	1.83	3202843	2.08		
320-35090-15	NAWC-011518-FRB-48	1416442	1.83	3166785	2.09		

13PFOA = 13C2-PFOA
13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS
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.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-21 | Lab Sample ID: 320-35090-1

Matrix: Water | Lab File ID: 2018.02.02_537A_012.d

Analysis Method: 537 | Date Collected: 01/15/2018 08:10

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 248.6(mL) | Date Analyzed: 02/02/2018 14:47

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

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

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

Analysis Batch No.: 206761 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	7.3	J M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	11	J	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)	4.7	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U M	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		70-130
STL00996	13C2 PFDA	105		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_012.d
Lims ID: 320-35090-A-1-A
Client ID: NAWC-011518-RW-21
Sample Type: Client
Inject. Date: 02-Feb-2018 14:47:32 ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:46:52 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:35:08

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									M
298.90 > 80.00	1.381	1.381	0.0	1.000	84595	0.7226		76.6	M
298.90 > 99.00	1.373	1.381	-0.008	0.995	65214		1.30(0.00-0.00)	116	M
$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1582778	10.3		8459	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.646	1.646	0.0	1.000	176682	1.01		103	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.646	1.646	0.0	1.000	153823	1.17		30.6	
* 6 13C2-PFOA									
415.00 > 370.00	1.844	1.844	0.0		1402398	10.0		6687	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.844	1.844	0.0	1.000	345485	2.66		50.7	
413.00 > 169.00	1.844	1.844	0.0	1.000	207760		1.66(0.00-0.00)	522	
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.094	0.008		3002549	28.7		4062	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.102	0.007	1.000	37826	0.4061		7.2	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.102	2.124	-0.022	1.000	178443	1.82		62.8	M
499.00 > 99.00	2.102	2.124	-0.022	1.000	29502		6.05(0.00-0.00)	44.3	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.261	0.007	1.000	1125049	10.5		8432	

QC Flag Legend

Review Flags

M - Manually Integrated

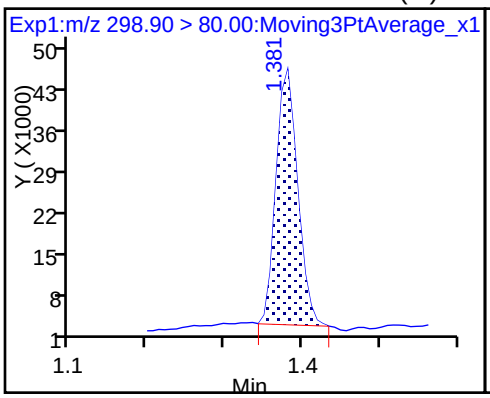
Report Date: 06-Feb-2018 13:47:04 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

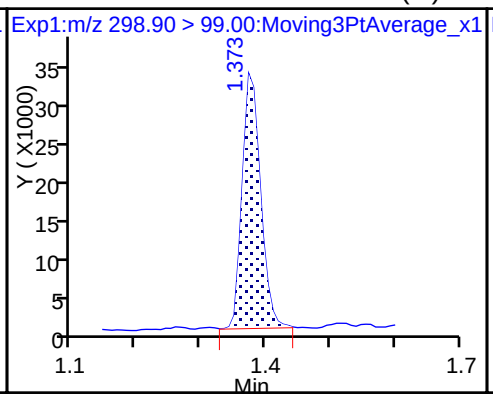
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_012.d

Injection Date:	02-Feb-2018 14:47:32	Instrument ID:	A8_N		
Lims ID:	320-35090-A-1-A	Lab Sample ID:	320-35090-1		
Client ID:	NAWC-011518-RW-21				
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		

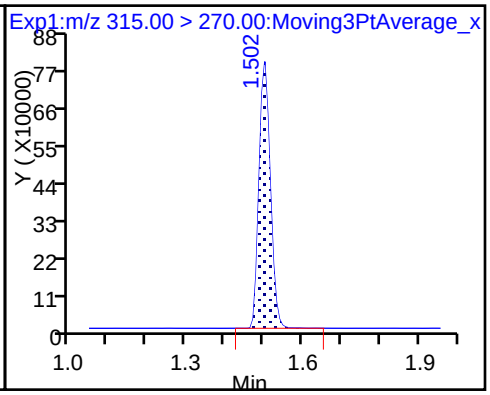
1 Perfluorobutanesulfonic acid (M)



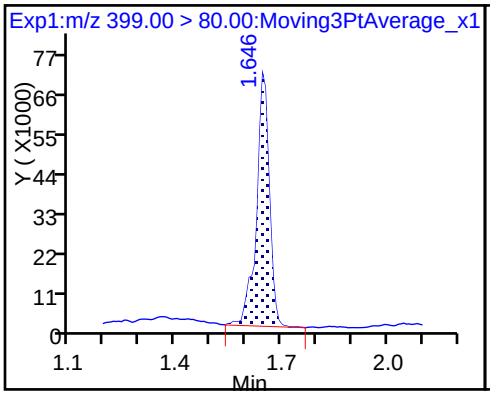
1 Perfluorobutanesulfonic acid (M)



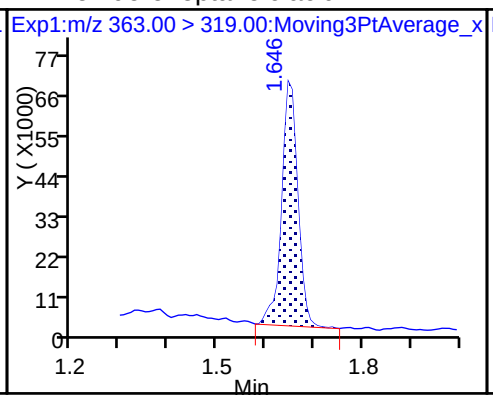
$ 2 13C2 PFHxA



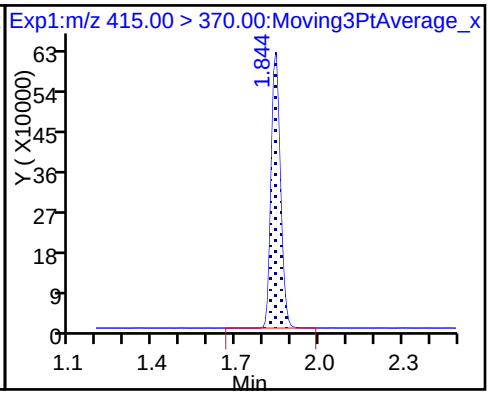
3 Perfluorohexanesulfonic acid



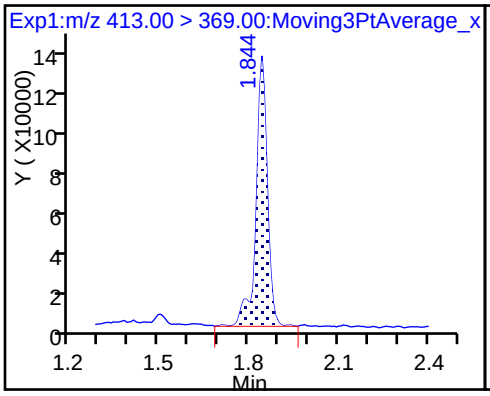
4 Perfluoroheptanoic acid



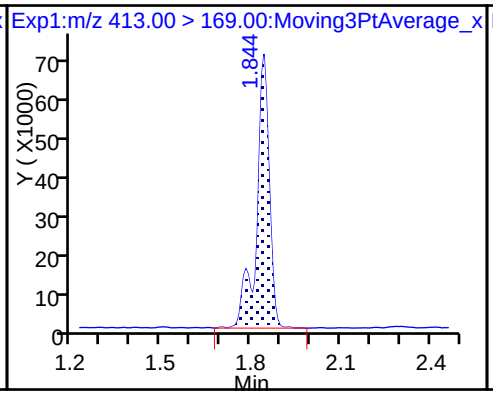
* 6 13C2-PFOA



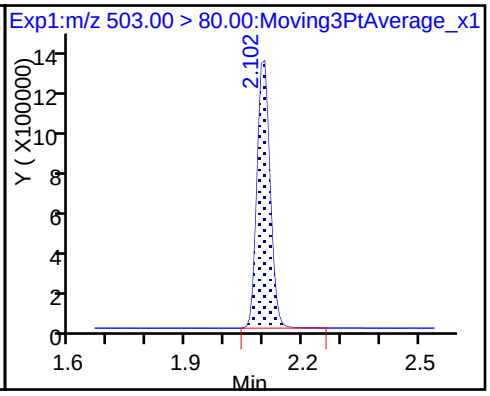
5 Perfluorooctanoic acid



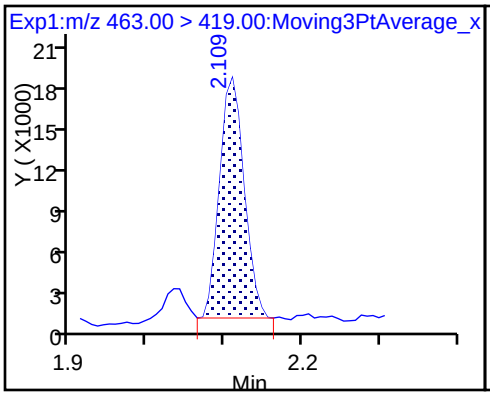
5 Perfluorooctanoic acid



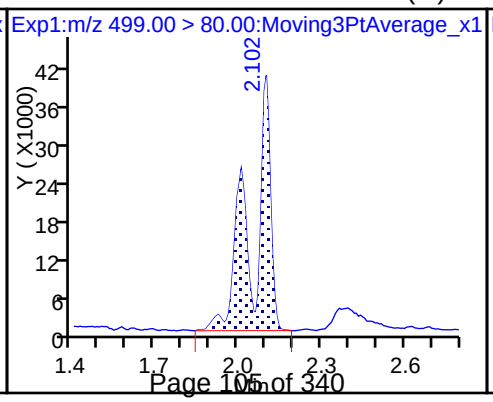
* 7 13C4 PFOS



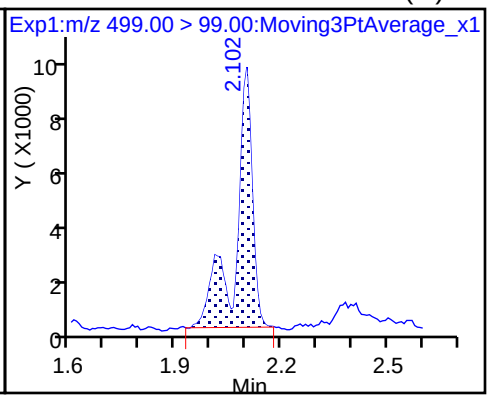
9 Perfluorononanoic acid



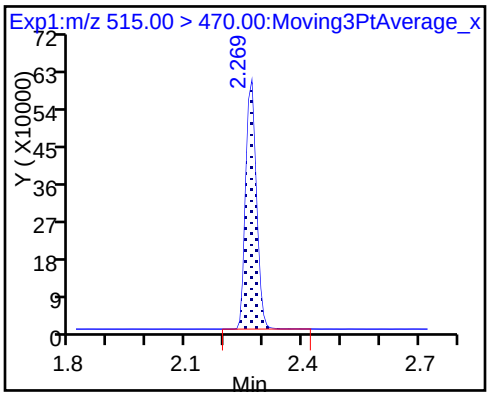
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.269
Y (X10000)
72
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\20180202-53640.b\2018.02.02_537A_012.d
Lims ID: 320-35090-A-1-A
Client ID: NAWC-011518-RW-21
Sample Type: Client
Inject. Date: 02-Feb-2018 14:47:32 ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:46:52 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:35:08

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.3	102.58
$ 10 13C2 PFDA	10.0	10.5	104.84

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

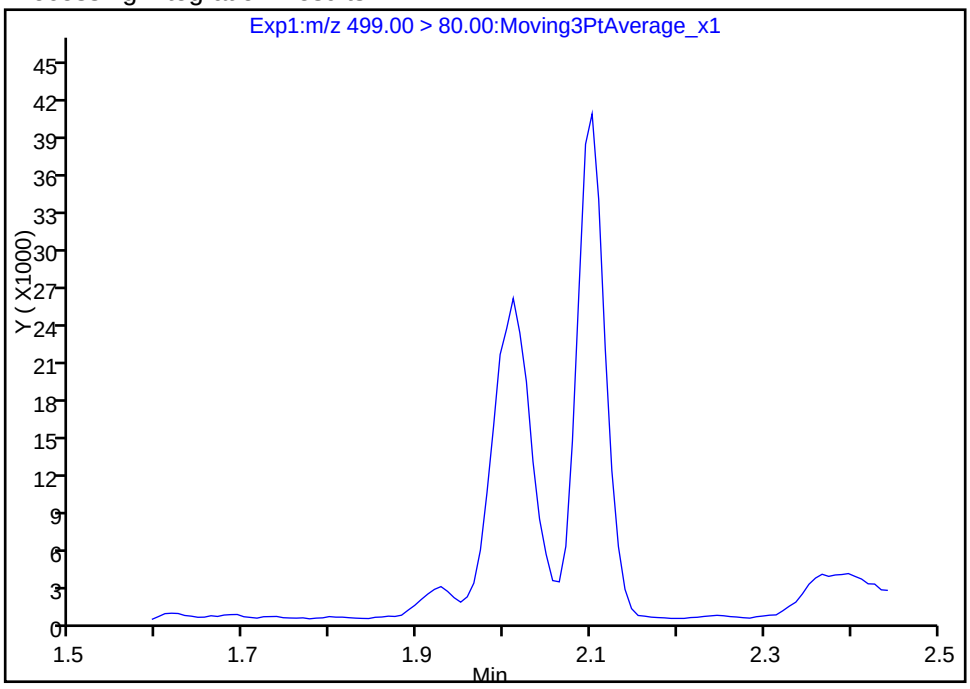
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_012.d				
Injection Date:	02-Feb-2018 14:47:32	Instrument ID:	A8_N		
Lims ID:	320-35090-A-1-A	Lab Sample ID:	320-35090-1		
Client ID:	NAWC-011518-RW-21				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	9
Injection 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

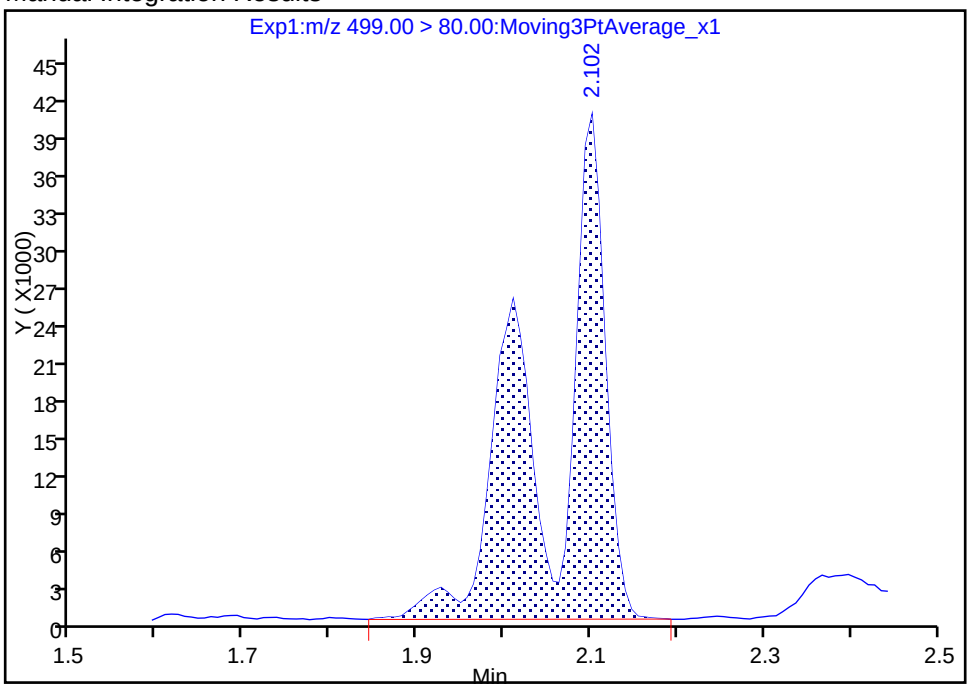
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 178443
Amount: 1.815293
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:34:35
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

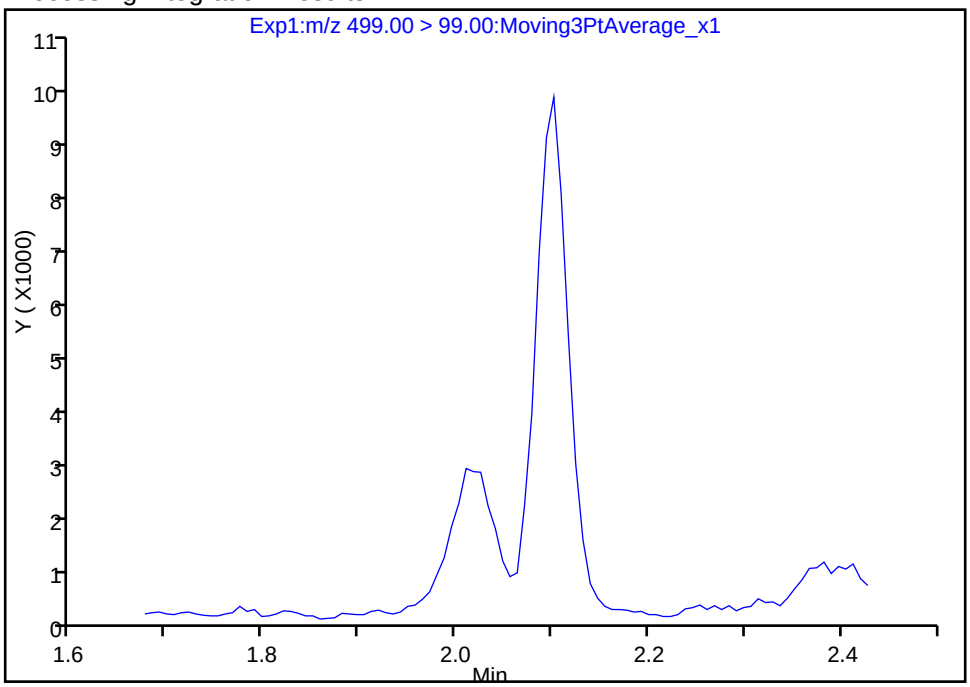
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_012.d				
Injection Date:	02-Feb-2018 14:47:32	Instrument ID:	A8_N		
Lims ID:	320-35090-A-1-A	Lab Sample ID:	320-35090-1		
Client ID:	NAWC-011518-RW-21				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	9
Injection 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

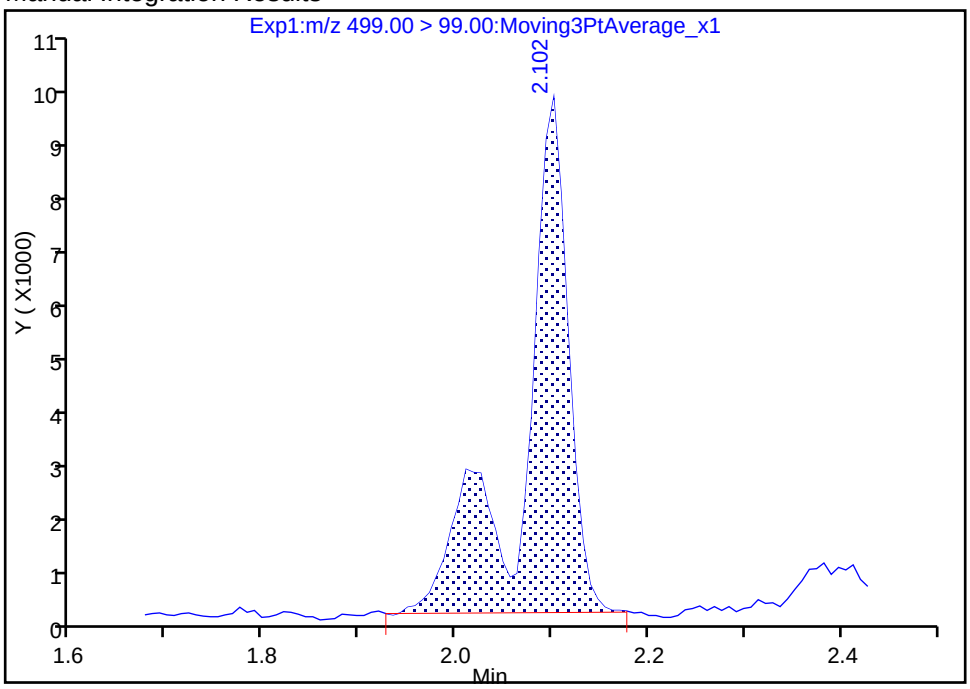
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 29502
Amount: 1.815293
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:34:39
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

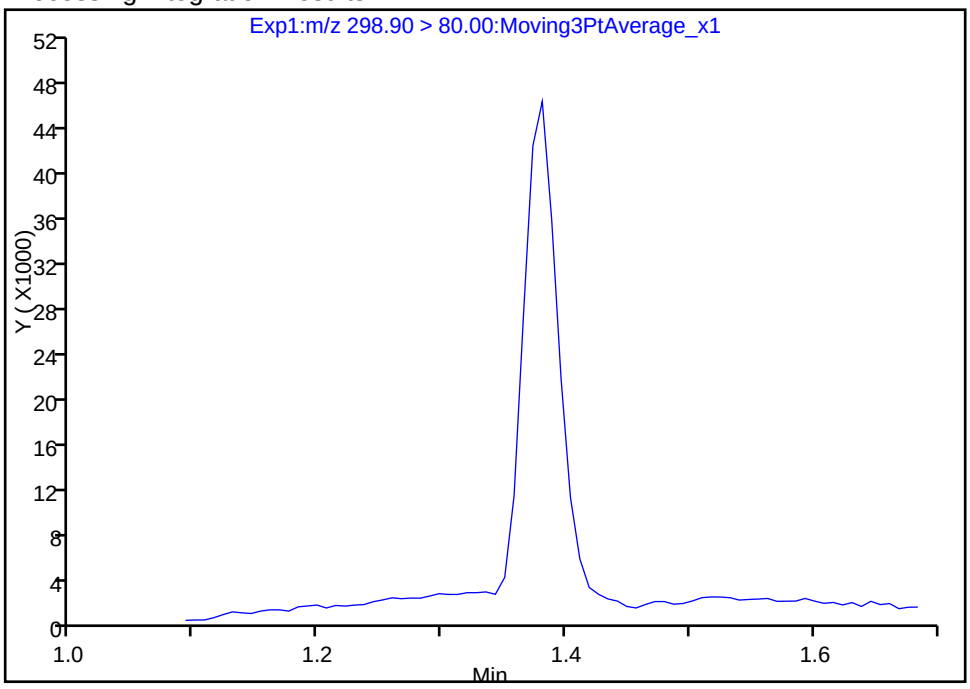
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_012.d				
Injection Date:	02-Feb-2018 14:47:32	Instrument ID:	A8_N		
Lims ID:	320-35090-A-1-A	Lab Sample ID:	320-35090-1		
Client ID:	NAWC-011518-RW-21				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

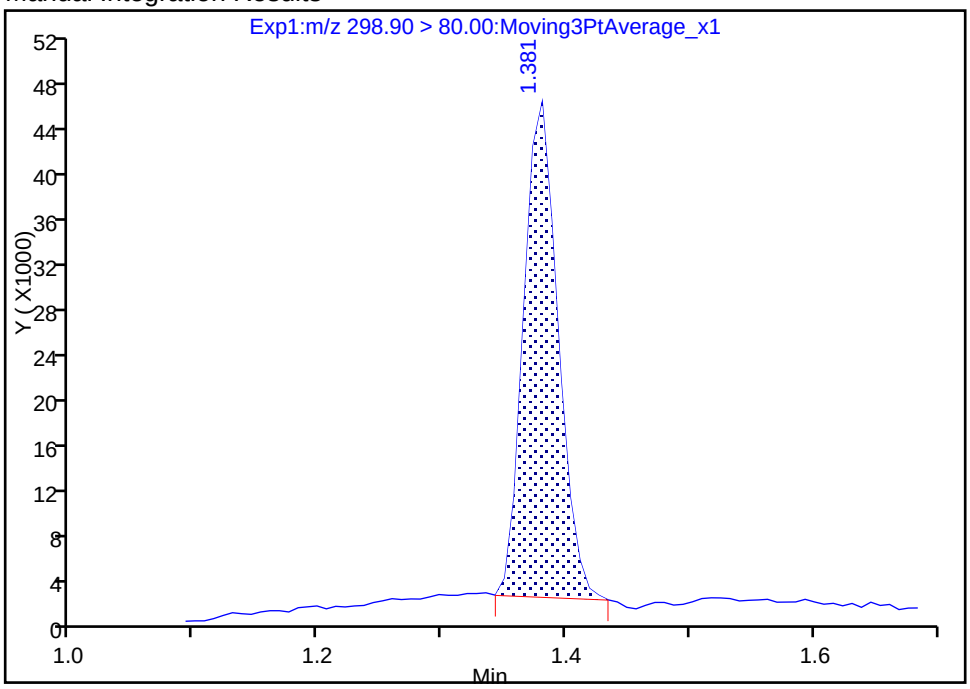
Not Detected
Expected RT: 1.38

Processing Integration Results



Manual Integration Results

RT: 1.38
Area: 84595
Amount: 0.722617
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:34:18
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

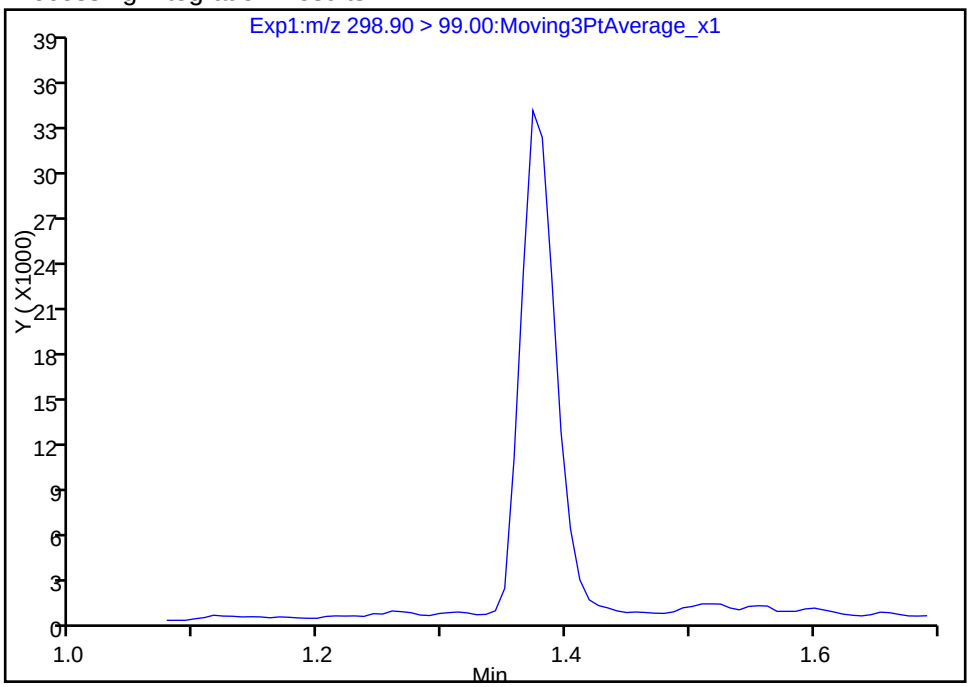
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_012.d				
Injection Date:	02-Feb-2018 14:47:32	Instrument ID:	A8_N		
Lims ID:	320-35090-A-1-A	Lab Sample ID:	320-35090-1		
Client ID:	NAWC-011518-RW-21				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

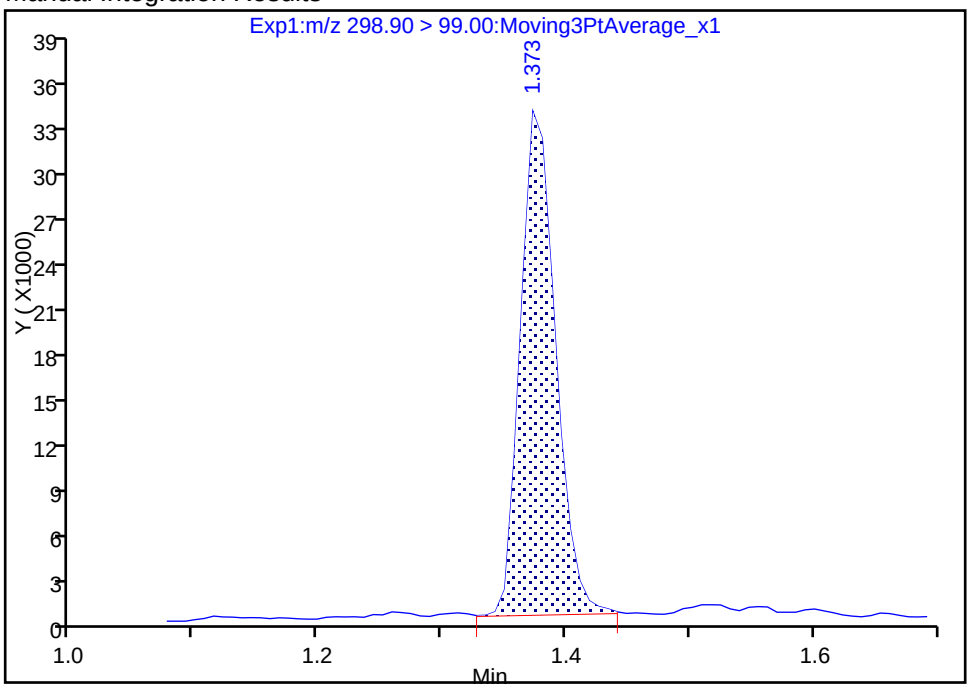
Not Detected
Expected RT: 1.38

Processing Integration Results



Manual Integration Results

RT: 1.37
Area: 65214
Amount: 0.722617
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:34:24
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-21 | Lab Sample ID: 320-35090-2

Matrix: Water | Lab File ID: 2018.02.02_537A_013.d

Analysis Method: 537 | Date Collected: 01/15/2018 08:05

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 249.4(mL) | Date Analyzed: 02/02/2018 14:52

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

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

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

Analysis Batch No.: 206761 | 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	105		70-130
STL00996	13C2 PFDA	110		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_013.d
Lims ID: 320-35090-A-2-A
Client ID: NAWC-011518-FRB-21
Sample Type: Client
Inject. Date: 02-Feb-2018 14:52:12 ALS Bottle#: 7 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:46:52 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:46:08

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.502	-0.007	1.000	1613779	10.5		9569	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.844	-0.008		1400952	10.0		6310	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.094	0.0		3069663	28.7		7292	
$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1175342	11.0		7947	

Report Date: 06-Feb-2018 13:47:04 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_013.d

Injection Date: 02-Feb-2018 14:52:12 Instrument ID: A8_N

Lims ID: 320-35090-A-2-A Lab Sample ID: 320-35090-2

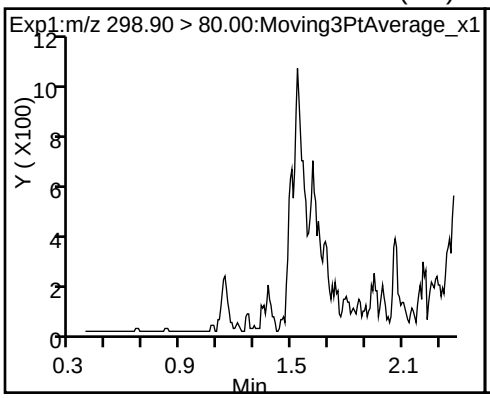
Client ID: NAWC-011518-FRB-21

Operator ID: SACINSTLCMS01 ALS Bottle#: 7 Worklist Smp#: 10

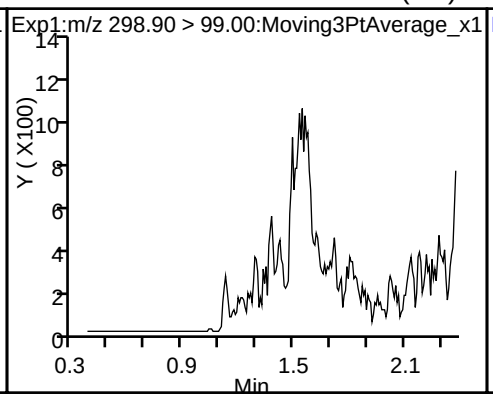
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

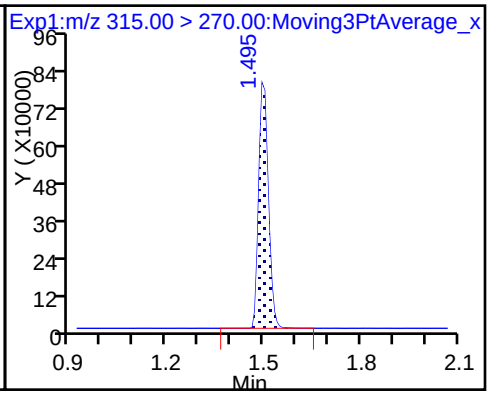
1 Perfluorobutanesulfonic acid (ND)



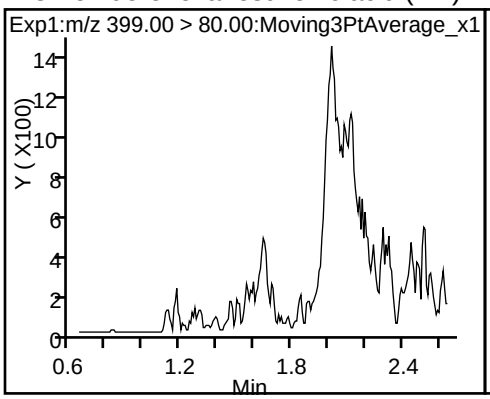
1 Perfluorobutanesulfonic acid (ND)



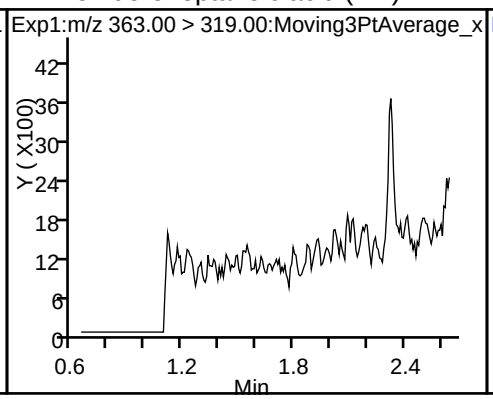
$ 2 13C2 PFHxA



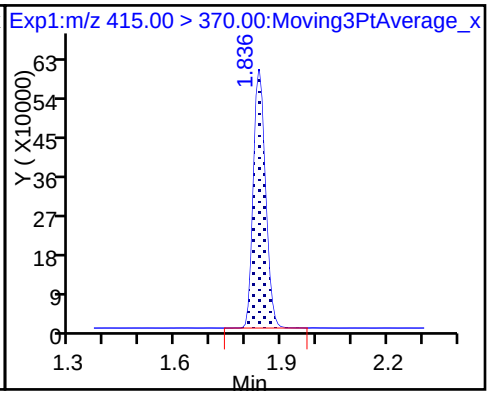
3 Perfluorohexanesulfonic acid (ND)



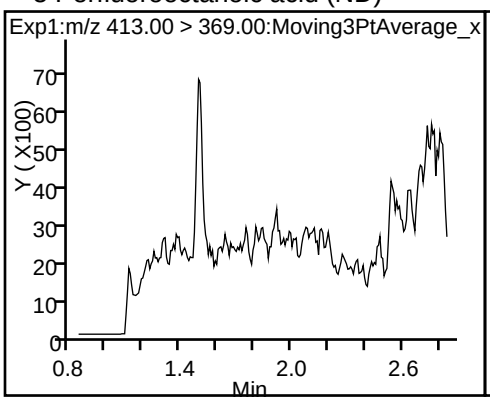
4 Perfluoroheptanoic acid (ND)



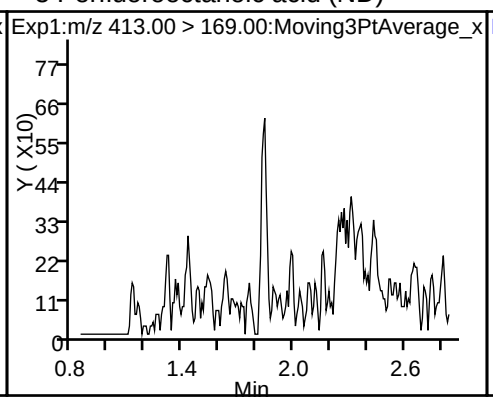
* 6 13C2-PFOA



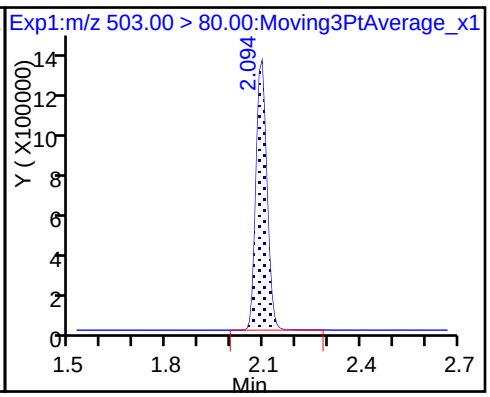
5 Perfluorooctanoic acid (ND)



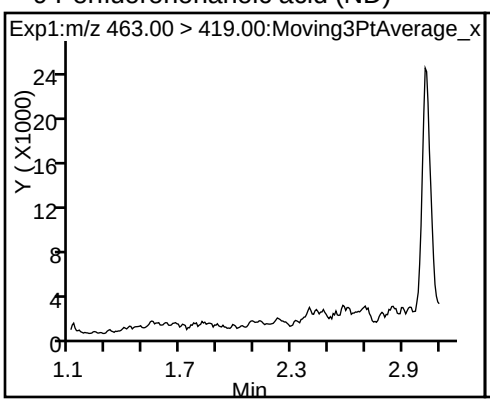
5 Perfluorooctanoic acid (ND)



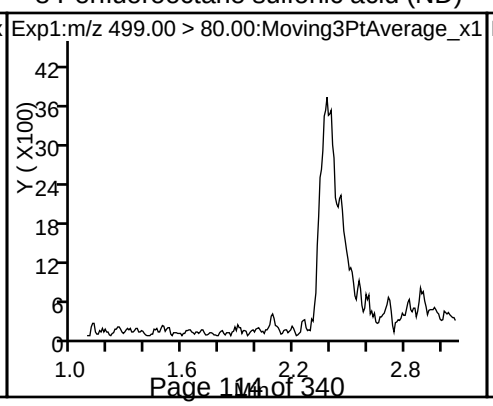
* 7 13C4 PFOS



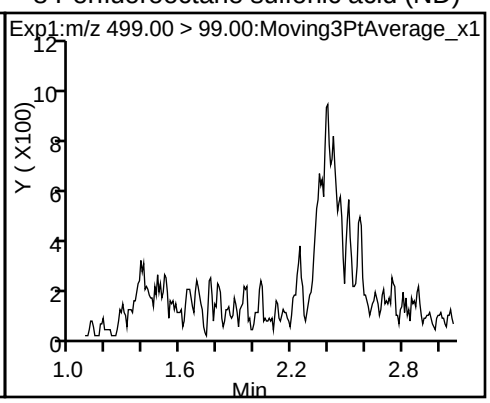
9 Perfluorononanoic acid (ND)



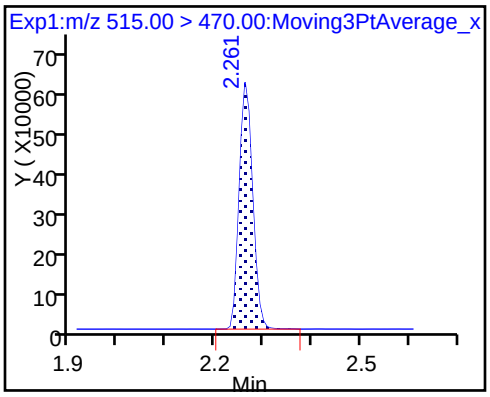
8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.261
Y (X10000)
70
60
50
40
30
20
10
0
1.9
2.2
2.5
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_013.d				
Lims ID:	320-35090-A-2-A				
Client ID:	NAWC-011518-FRB-21				
Sample Type:	Client				
Inject. Date:	02-Feb-2018 14:52:12	ALS Bottle#:	7	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-35090-a-2-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	06-Feb-2018 13:46:52	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:	XAWRK055				
First Level Reviewer: hannigana		Date:	06-Feb-2018 13:46:08		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.5	104.69
$ 10 13C2 PFDA	10.0	11.0	109.64

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-233 | Lab Sample ID: 320-35090-3

Matrix: Water | Lab File ID: 2018.02.02_537A_014.d

Analysis Method: 537 | Date Collected: 01/15/2018 08:40

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 253.7(mL) | Date Analyzed: 02/02/2018 14:56

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

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

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

Analysis Batch No.: 206761 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	8.1	J M	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	11	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.0	J	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U M	89	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	99		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_014.d
Lims ID: 320-35090-A-3-A
Client ID: NAWC-011518-RW-233
Sample Type: Client
Inject. Date: 02-Feb-2018 14:56:52 ALS Bottle#: 8 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-3-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:46:52 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:36:48

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									M
298.90 > 80.00	1.373	1.381	-0.008	1.000	79876	0.6494		51.3	M
298.90 > 99.00	1.373	1.381	-0.008	1.000	61731		1.29(0.00-0.00)	79.4	M
$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.502	-0.007	1.000	1618583	9.70		8801	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.646	1.646	0.0	1.000	136316	0.7403		62.9	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.646	1.646	0.0	1.000	218053	1.53		39.7	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.844	-0.008		1517070	10.0		7103	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.836	1.844	-0.008	1.000	394439	2.81		56.2	
413.00 > 169.00	1.836	1.844	-0.008	1.000	213057		1.85(0.00-0.00)	460	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.094	0.0		3154398	28.7		3262	
9 Perfluorononanoic acid									M
463.00 > 419.00	2.102	2.102	0.0	1.000	37783	0.3750		7.6	M
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.094	2.124	-0.030	1.000	211268	2.05		62.9	M
499.00 > 99.00	2.094	2.124	-0.030	1.000	33706		6.27(0.00-0.00)	44.2	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1153209	9.93		8286	

QC Flag Legend

Review Flags

M - Manually Integrated

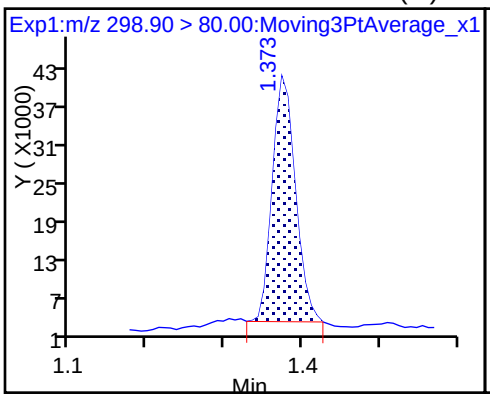
Report Date: 06-Feb-2018 13:47:05 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

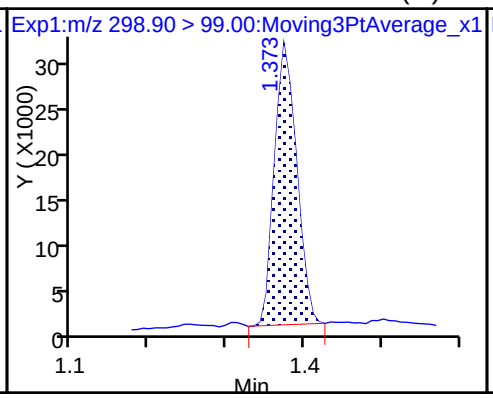
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_014.d

Injection Date:	02-Feb-2018 14:56:52	Instrument ID:	A8_N		
Lims ID:	320-35090-A-3-A	Lab Sample ID:	320-35090-3		
Client ID:	NAWC-011518-RW-233				
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		

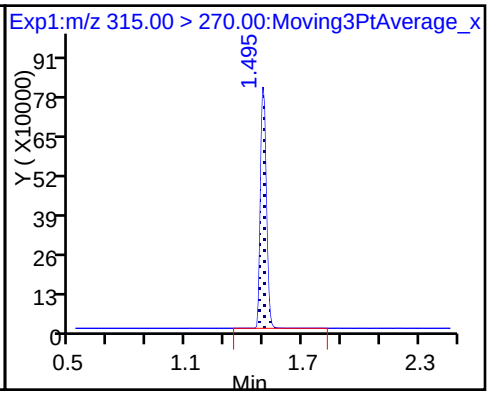
1 Perfluorobutanesulfonic acid (M)



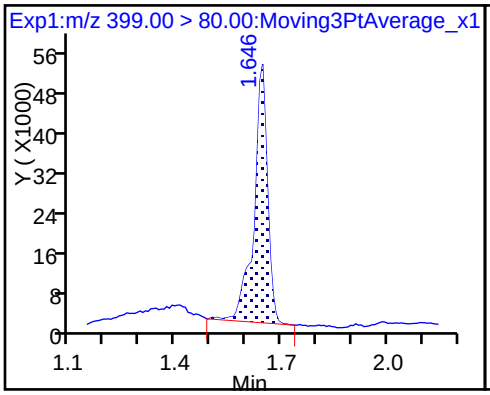
1 Perfluorobutanesulfonic acid (M)



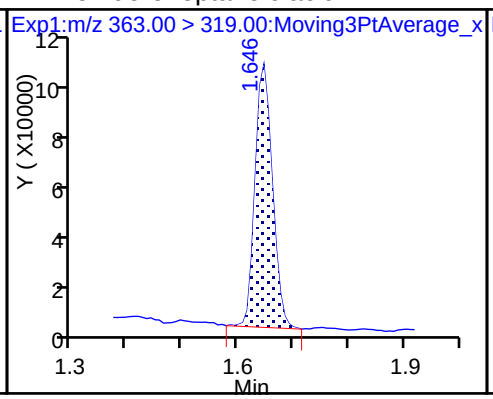
$ 2 13C2 PFHxA



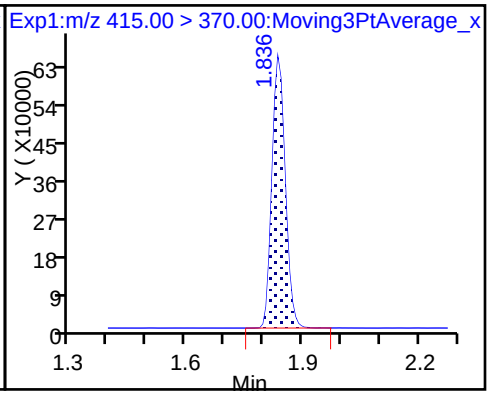
3 Perfluorohexanesulfonic acid



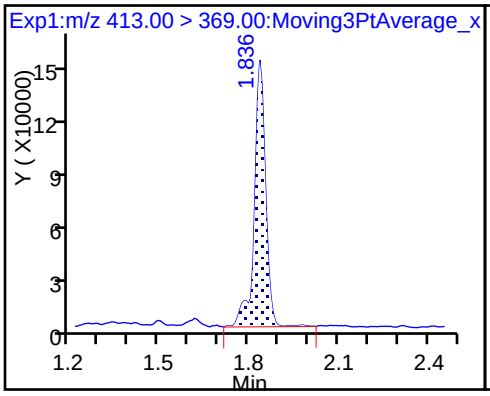
4 Perfluoroheptanoic acid



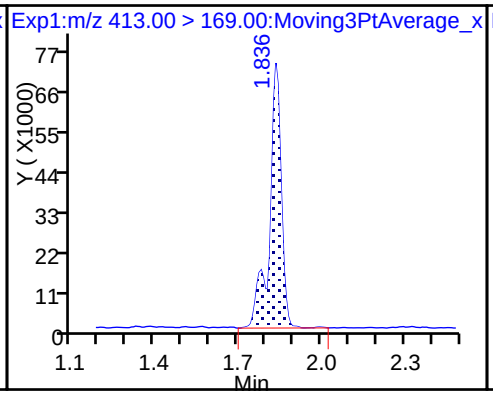
* 6 13C2-PFOA



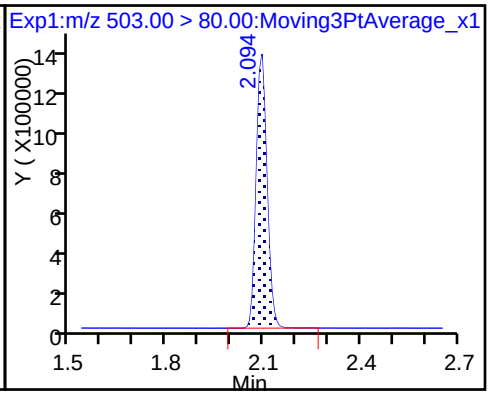
5 Perfluorooctanoic acid



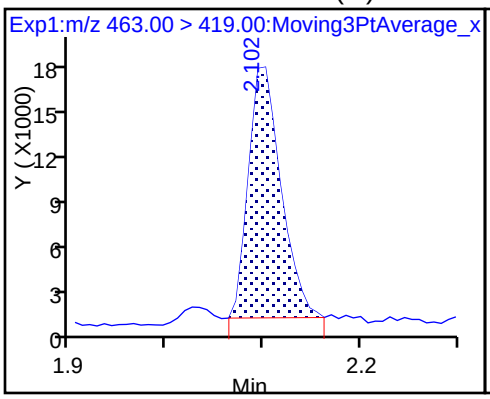
5 Perfluorooctanoic acid



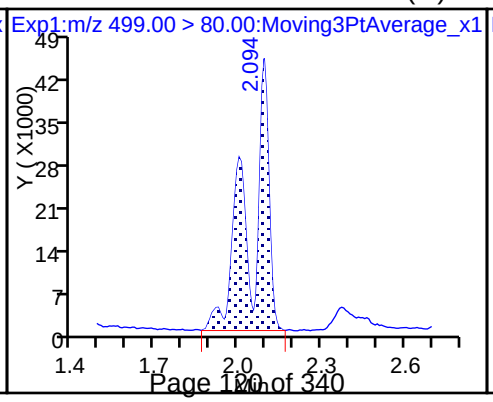
* 7 13C4 PFOS



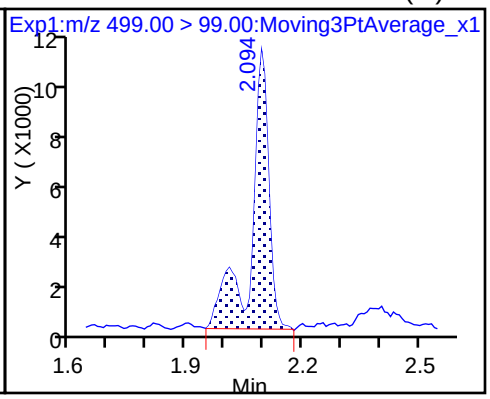
9 Perfluorononanoic acid (M)



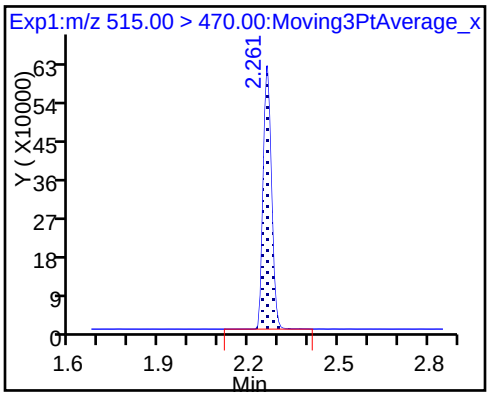
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.261
Y (X10000)
63
54
45
36
27
18
9
0
1.6
1.9
2.2
2.5
2.8
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_014.d				
Lims ID:	320-35090-A-3-A				
Client ID:	NAWC-011518-RW-233				
Sample Type:	Client				
Inject. Date:	02-Feb-2018 14:56:52	ALS Bottle#:	8	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-35090-a-3-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	06-Feb-2018 13:46:52	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:	XAWRK055				
First Level Reviewer: hannigana		Date:	06-Feb-2018 13:36:48		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	9.70	96.97
$ 10 13C2 PFDA	10.0	9.93	99.34

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

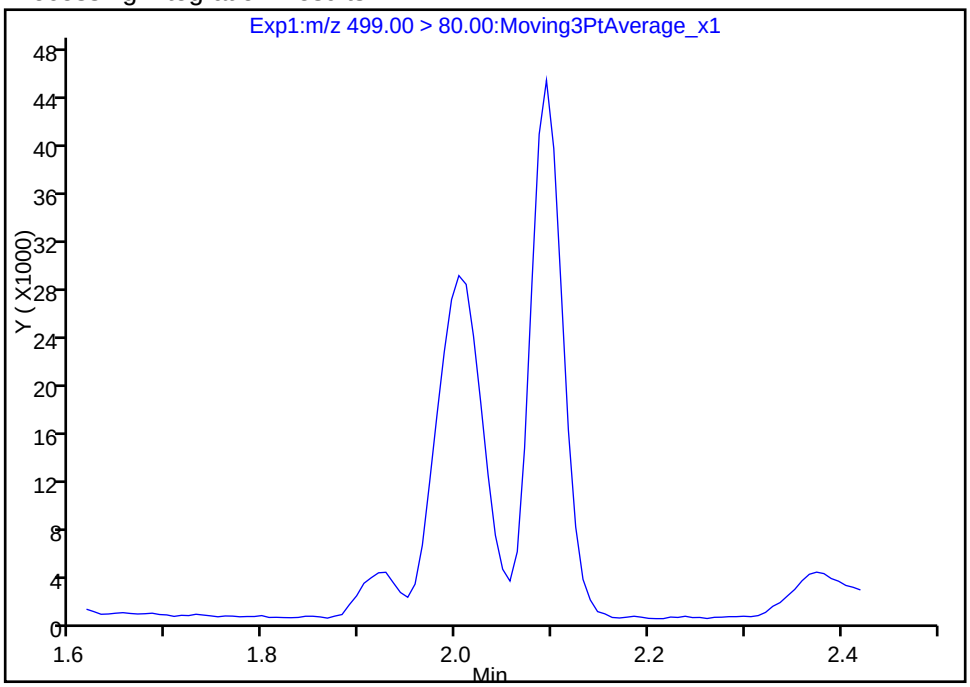
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_014.d				
Injection Date:	02-Feb-2018 14:56:52	Instrument ID:	A8_N		
Lims ID:	320-35090-A-3-A	Lab Sample ID:	320-35090-3		
Client ID:	NAWC-011518-RW-233				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	8	Worklist Smp#:	11
Injection 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

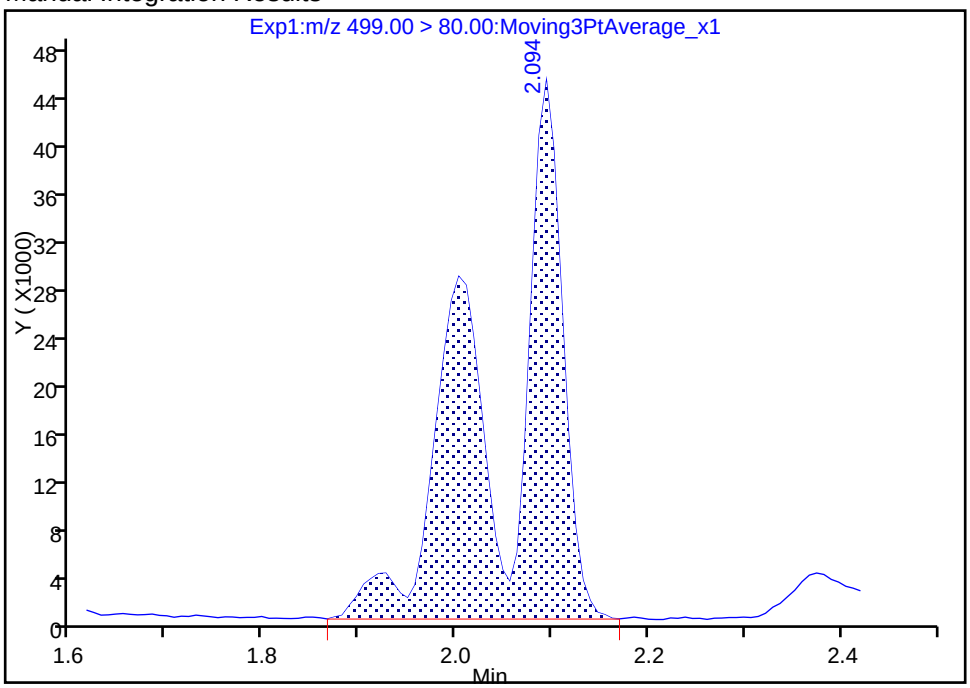
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.09
Area: 211268
Amount: 2.045759
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:36:09
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

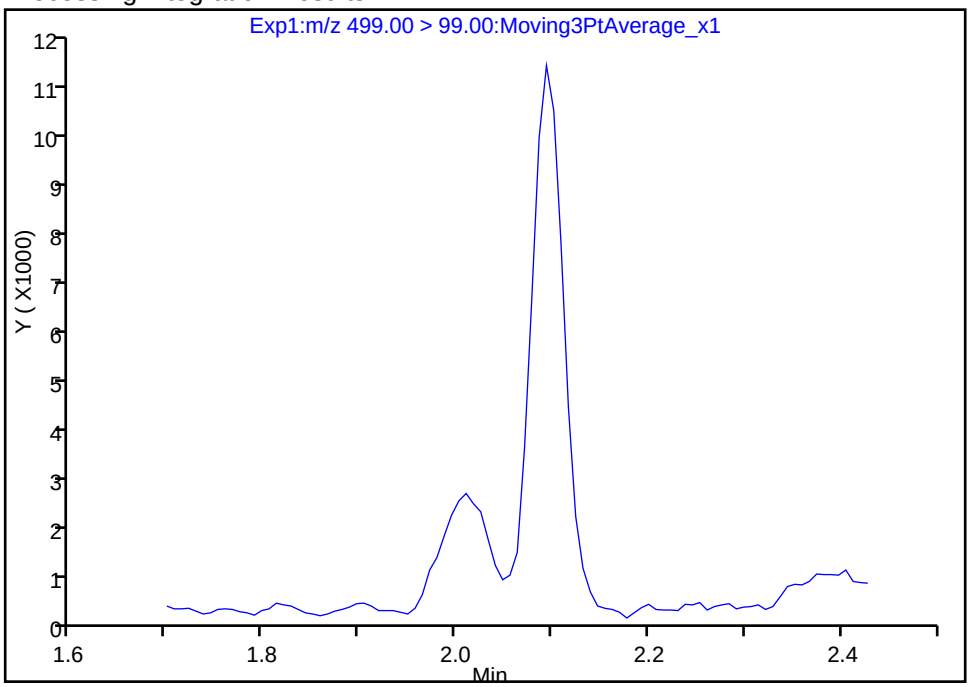
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_014.d				
Injection Date:	02-Feb-2018 14:56:52	Instrument ID:	A8_N		
Lims ID:	320-35090-A-3-A	Lab Sample ID:	320-35090-3		
Client ID:	NAWC-011518-RW-233				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	8	Worklist Smp#:	11
Injection 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

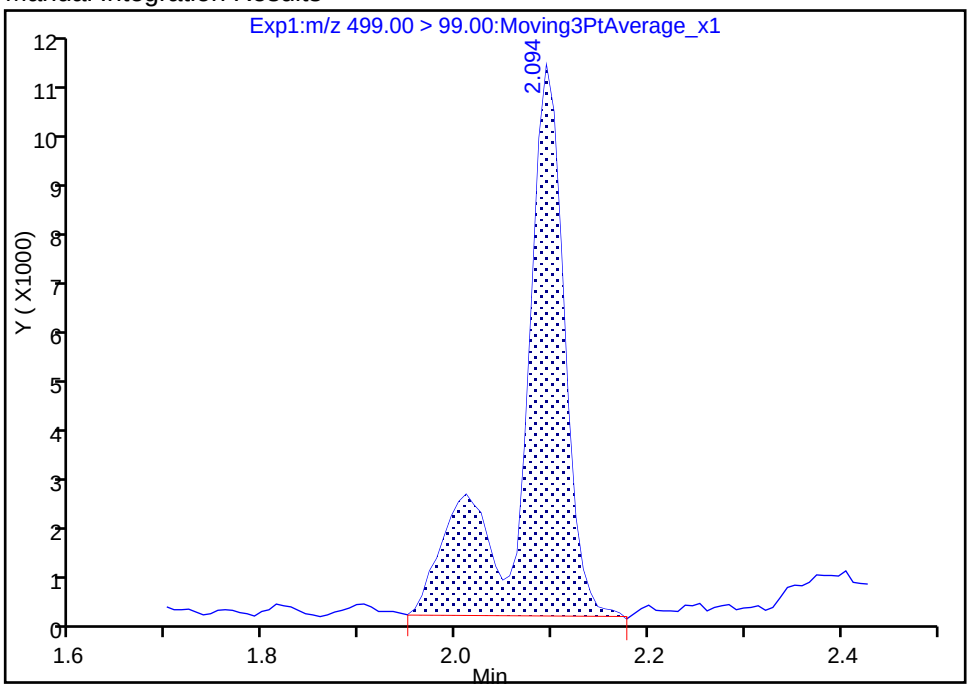
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.09
Area: 33706
Amount: 2.045759
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:36:12
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

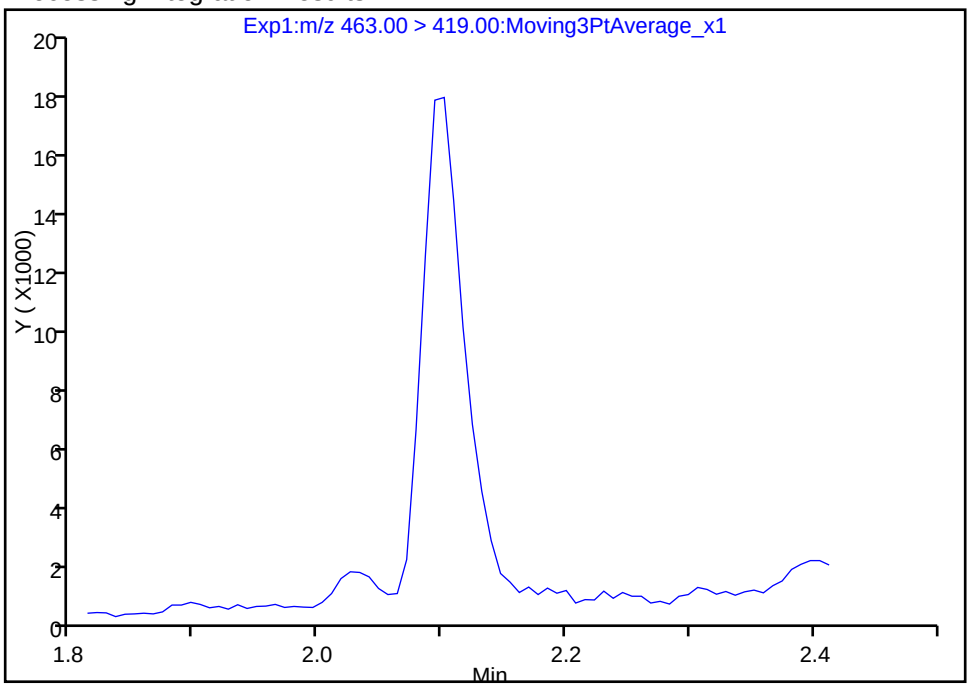
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_014.d				
Injection Date:	02-Feb-2018 14:56:52	Instrument ID:	A8_N		
Lims ID:	320-35090-A-3-A	Lab Sample ID:	320-35090-3		
Client ID:	NAWC-011518-RW-233				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	8	Worklist Smp#:	11
Injection 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

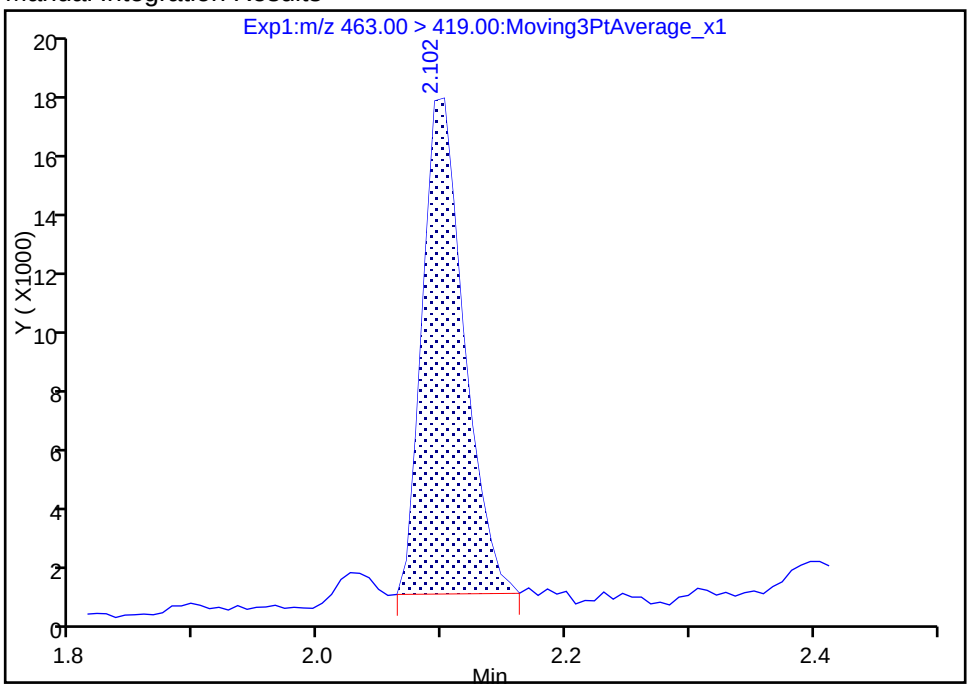
Not Detected
Expected RT: 2.10

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 37783
Amount: 0.374988
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:36:21
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

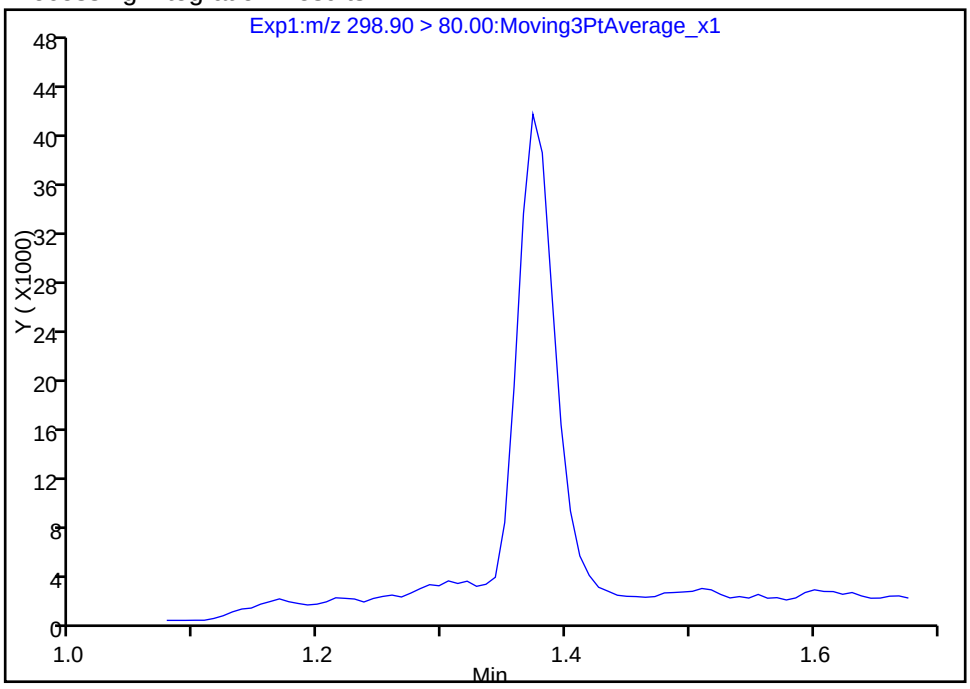
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_014.d				
Injection Date:	02-Feb-2018 14:56:52	Instrument ID:	A8_N		
Lims ID:	320-35090-A-3-A	Lab Sample ID:	320-35090-3		
Client ID:	NAWC-011518-RW-233				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	8	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

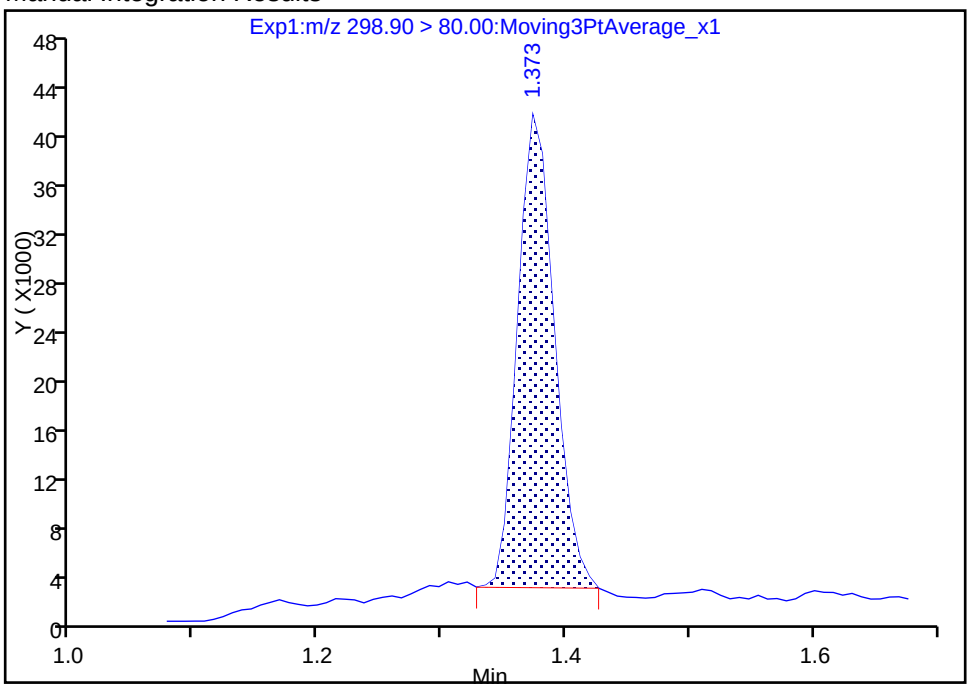
Not Detected
Expected RT: 1.38

Processing Integration Results



Manual Integration Results

RT: 1.37
Area: 79876
Amount: 0.649398
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:35:55
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

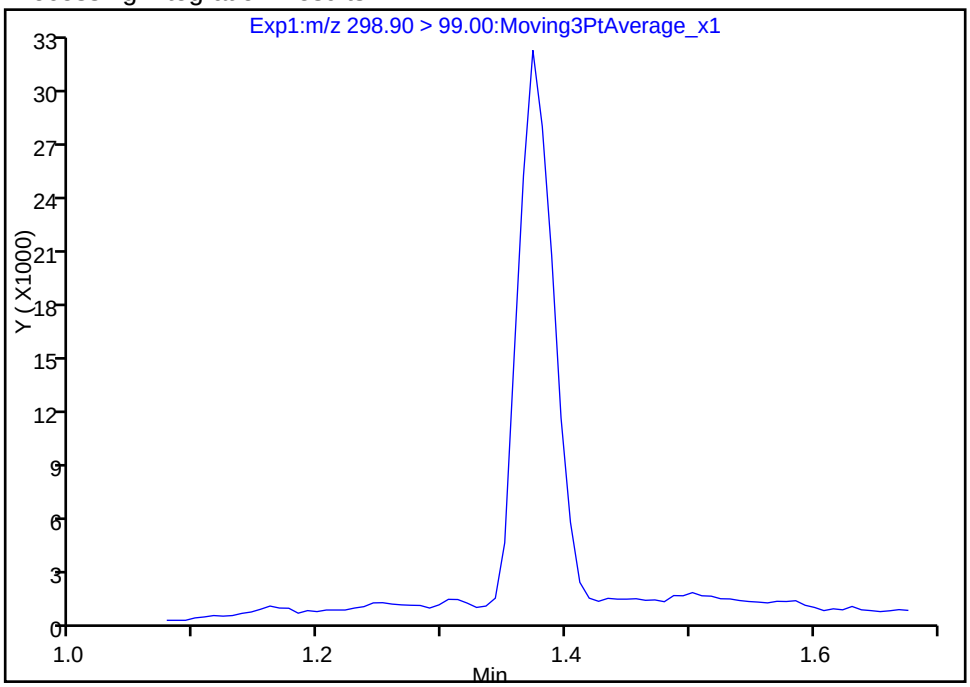
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_014.d				
Injection Date:	02-Feb-2018 14:56:52	Instrument ID:	A8_N		
Lims ID:	320-35090-A-3-A	Lab Sample ID:	320-35090-3		
Client ID:	NAWC-011518-RW-233				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	8	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

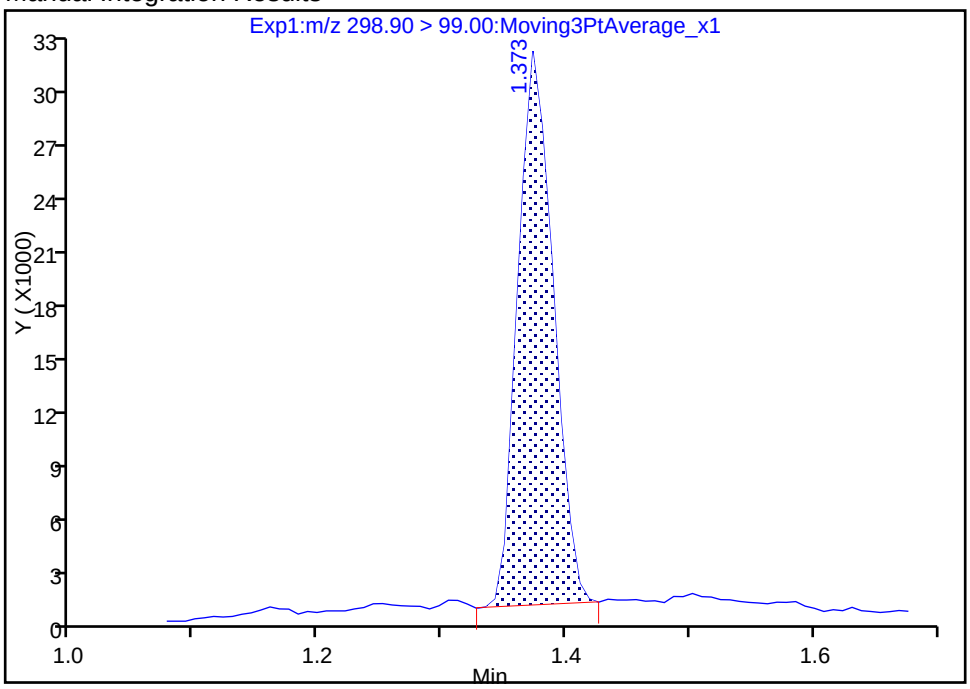
Not Detected
Expected RT: 1.38

Processing Integration Results



Manual Integration Results

RT: 1.37
Area: 61731
Amount: 0.649398
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:35:59
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-233 | Lab Sample ID: 320-35090-4

Matrix: Water | Lab File ID: 2018.02.02_537A_015.d

Analysis Method: 537 | Date Collected: 01/15/2018 08:35

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 250.6(mL) | Date Analyzed: 02/02/2018 15:01

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

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

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

Analysis Batch No.: 206761 | 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	106		70-130
STL00996	13C2 PFDA	106		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_015.d
Lims ID: 320-35090-A-4-A
Client ID: NAWC-011518-FRB-233
Sample Type: Client
Inject. Date: 02-Feb-2018 15:01:33 ALS Bottle#: 9 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-4-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:46:52 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:46:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.502	-0.007	1.000	1602564	10.6		8712	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.844	-0.008		1379723	10.0		6056	
* 7 13C4 PFOS									
503.00 > 80.00	2.086	2.094	-0.008		3086428	28.7		7272	
$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1122310	10.6		9928	

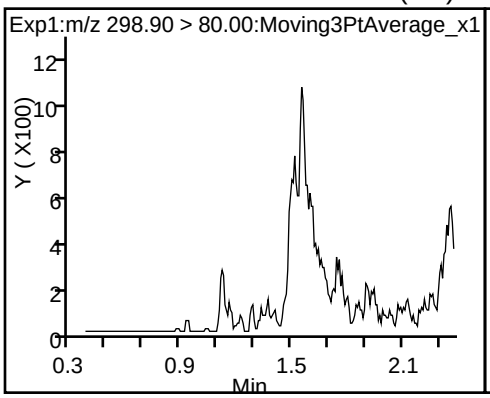
Report Date: 06-Feb-2018 13:47:07 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

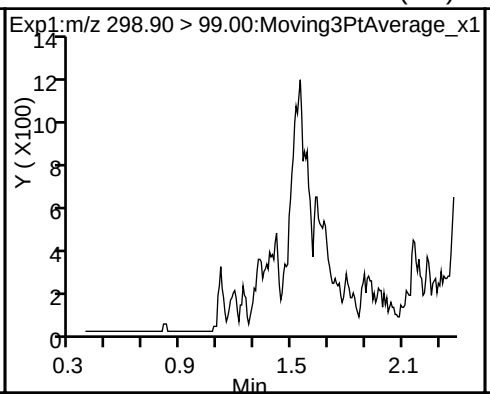
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_015.d

Injection Date:	02-Feb-2018 15:01:33	Instrument ID:	A8_N		
Lims ID:	320-35090-A-4-A	Lab Sample ID:	320-35090-4		
Client ID:	NAWC-011518-FRB-233				
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		

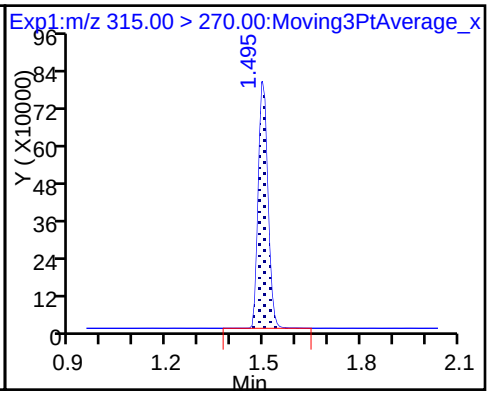
1 Perfluorobutanesulfonic acid (ND)



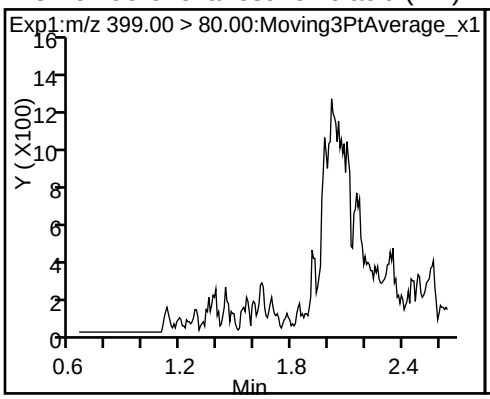
1 Perfluorobutanesulfonic acid (ND)



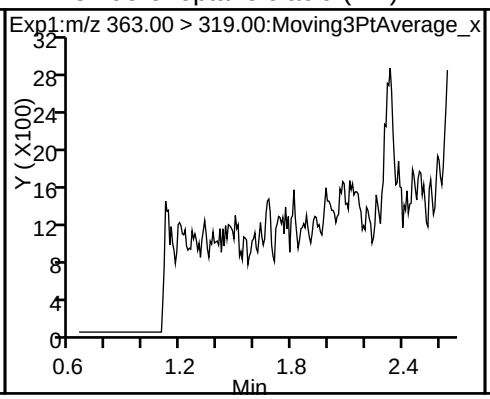
$ 2 13C2 PFHxA



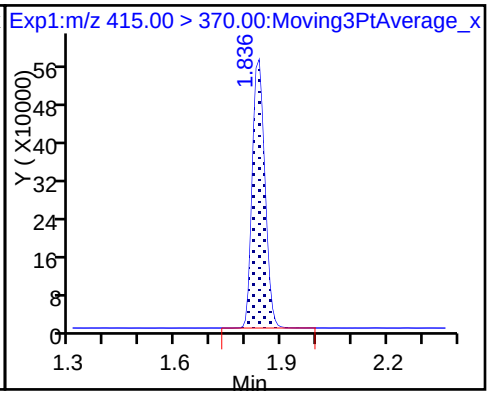
3 Perfluorohexanesulfonic acid (ND)



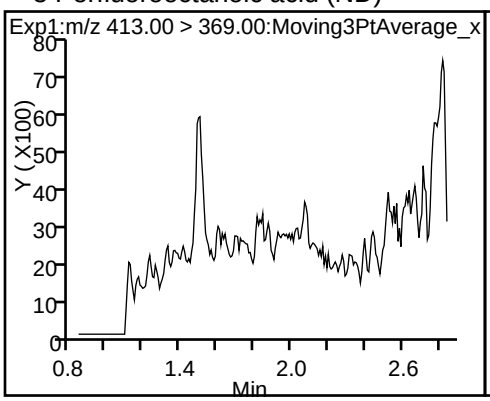
4 Perfluoroheptanoic acid (ND)



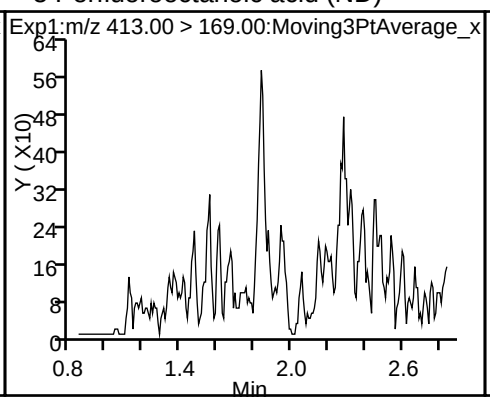
* 6 13C2-PFOA



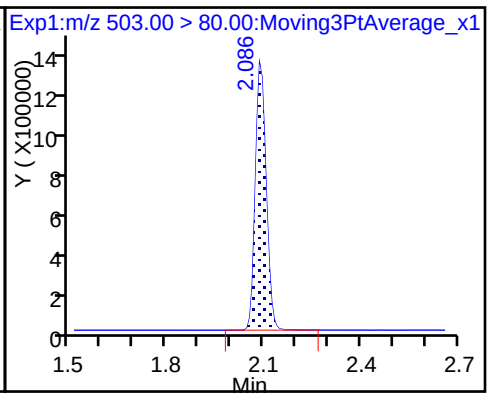
5 Perfluorooctanoic acid (ND)



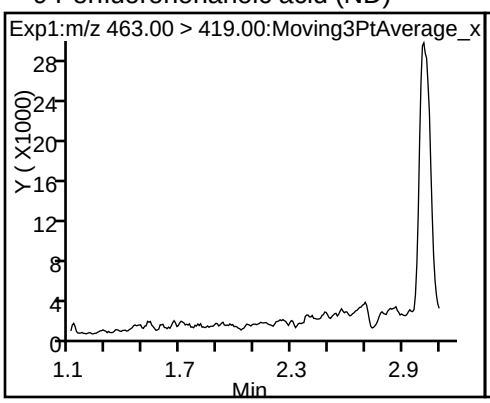
5 Perfluorooctanoic acid (ND)



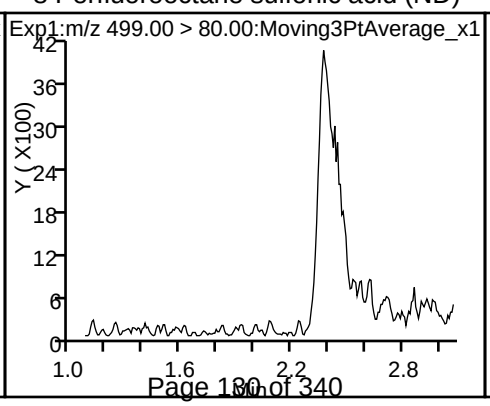
* 7 13C4 PFOS



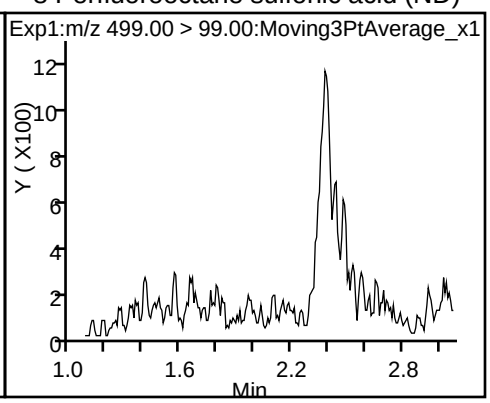
9 Perfluorononanoic acid (ND)



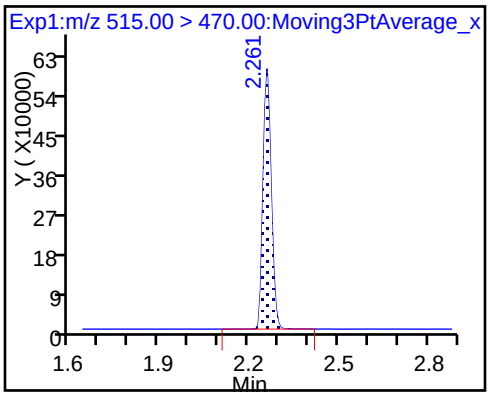
8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.261
Y (X10000)
63
54
45
36
27
18
9
0
1.6
1.9
2.2
2.5
2.8
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_015.d				
Lims ID:	320-35090-A-4-A				
Client ID:	NAWC-011518-FRB-233				
Sample Type:	Client				
Inject. Date:	02-Feb-2018 15:01:33	ALS Bottle#:	9	Worklist Smp#:	12
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-35090-a-4-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	06-Feb-2018 13:46:52	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:	XAWRK055				
First Level Reviewer: hannigana		Date:	06-Feb-2018 13:46:32		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.6	105.56
$ 10 13C2 PFDA	10.0	10.6	106.30

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-241 | Lab Sample ID: 320-35090-5

Matrix: Water | Lab File ID: 2018.02.02_537A_016.d

Analysis Method: 537 | Date Collected: 01/15/2018 09:10

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 249(mL) | Date Analyzed: 02/02/2018 15:06

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

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

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

Analysis Batch No.: 206761 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	J M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	13	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)	7.1	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	103		70-130
STL00996	13C2 PFDA	107		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_016.d
Lims ID: 320-35090-A-5-A
Client ID: NAWC-011518-RW-241
Sample Type: Client
Inject. Date: 02-Feb-2018 15:06:12 ALS Bottle#: 10 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-5-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:46:52 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:37:29

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.381	-0.008	1.000	129428	1.06		134	
298.90 > 99.00	1.373	1.381	-0.008	1.000	90490		1.43(0.00-0.00)	141	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.502	-0.007	1.000	1598260	10.3		7845	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.646	1.646	0.0	1.000	321833	1.76		230	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.646	1.646	0.0	1.000	156243	1.18		31.0	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.844	-0.008		1413224	10.0		6123	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.836	1.844	-0.008	1.000	416243	3.18		56.2	
413.00 > 169.00	1.836	1.844	-0.008	1.000	251453		1.66(0.00-0.00)	654	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.094	0.0		3132065	28.7		4758	
9 Perfluorononanoic acid									M
463.00 > 419.00	2.102	2.102	0.0	1.000	34874	0.3716		5.8	M
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.094	2.124	-0.030	1.000	415610	4.05		169	M
499.00 > 99.00	2.094	2.124	-0.030	1.000	76799		5.41(0.00-0.00)	113	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1151816	10.7		8842	

QC Flag Legend

Review Flags

M - Manually Integrated

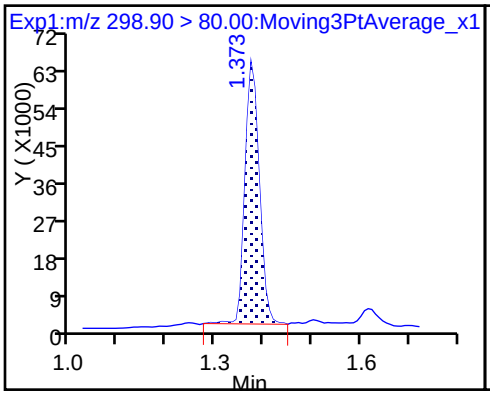
Report Date: 06-Feb-2018 13:47:07 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

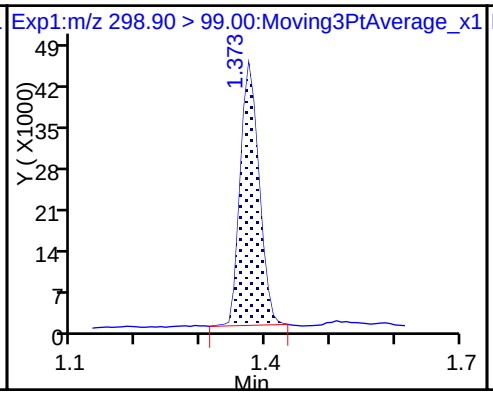
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_016.d

Injection Date:	02-Feb-2018 15:06:12	Instrument ID:	A8_N		
Lims ID:	320-35090-A-5-A	Lab Sample ID:	320-35090-5		
Client ID:	NAWC-011518-RW-241				
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		

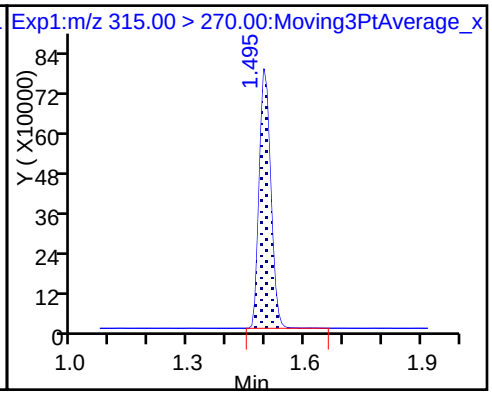
1 Perfluorobutanesulfonic acid



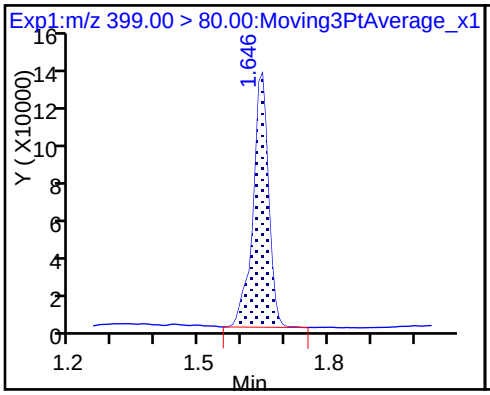
1 Perfluorobutanesulfonic acid



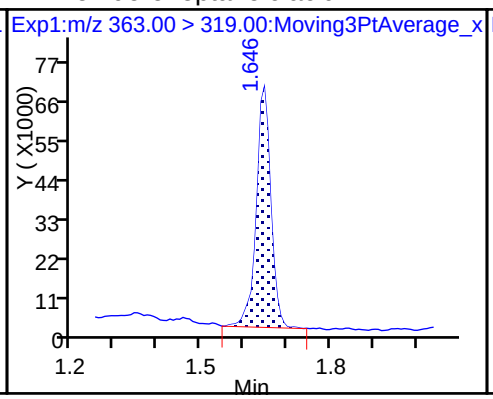
$ 2 13C2 PFHxA



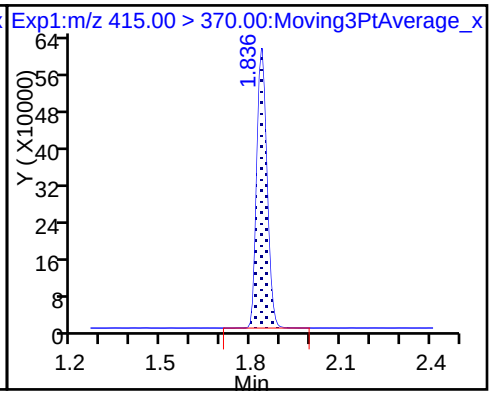
3 Perfluorohexanesulfonic acid



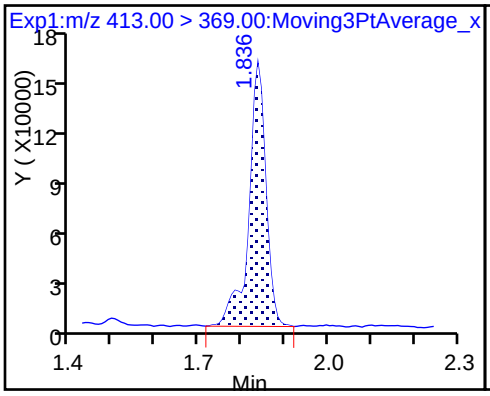
4 Perfluoroheptanoic acid



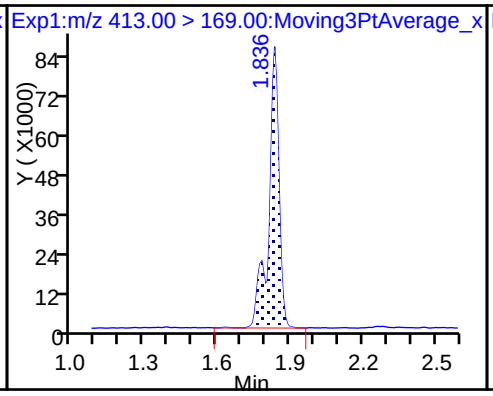
* 6 13C2-PFOA



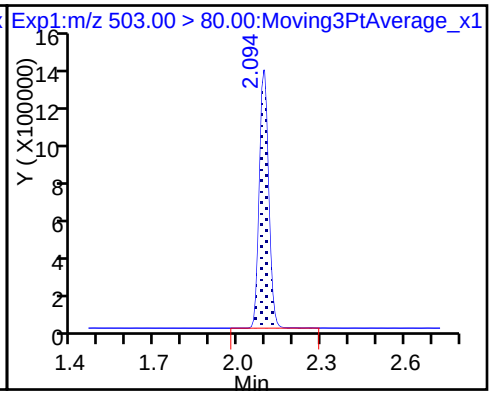
5 Perfluorooctanoic acid



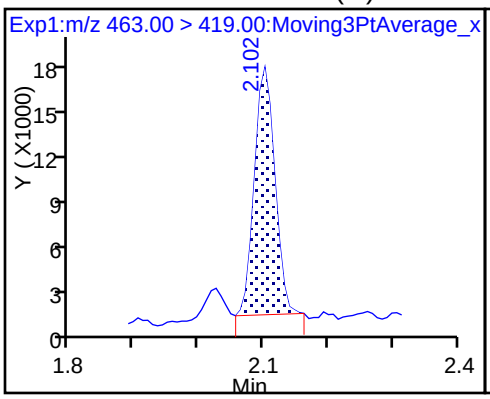
5 Perfluorooctanoic acid



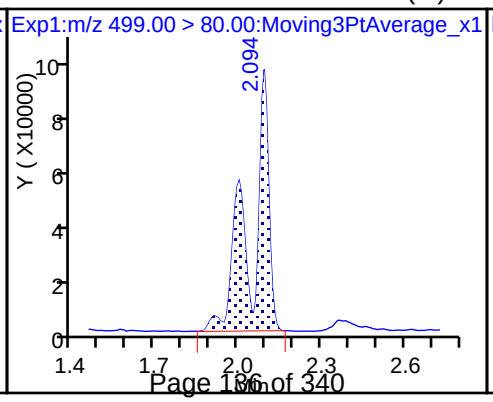
* 7 13C4 PFOS



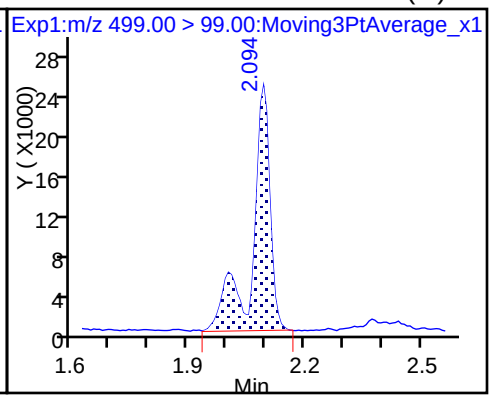
9 Perfluorononanoic acid (M)



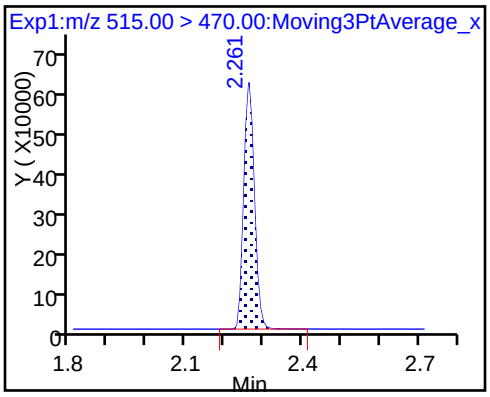
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.261
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\20180202-53640.b\2018.02.02_537A_016.d				
Lims ID:	320-35090-A-5-A				
Client ID:	NAWC-011518-RW-241				
Sample Type:	Client				
Inject. Date:	02-Feb-2018 15:06:12	ALS Bottle#:	10	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-35090-a-5-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	06-Feb-2018 13:46:52	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:	XAWRK055				
First Level Reviewer: hannigana		Date:	06-Feb-2018 13:37:29		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.3	102.78
$ 10 13C2 PFDA	10.0	10.7	106.51

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

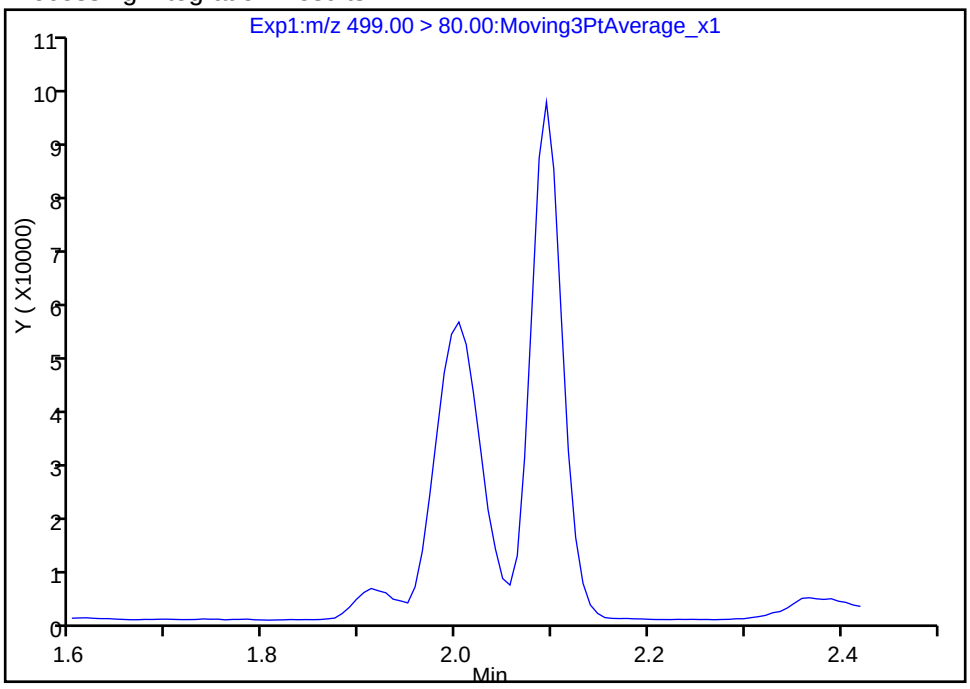
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_016.d				
Injection Date:	02-Feb-2018 15:06:12	Instrument ID:	A8_N		
Lims ID:	320-35090-A-5-A	Lab Sample ID:	320-35090-5		
Client ID:	NAWC-011518-RW-241				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	10	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

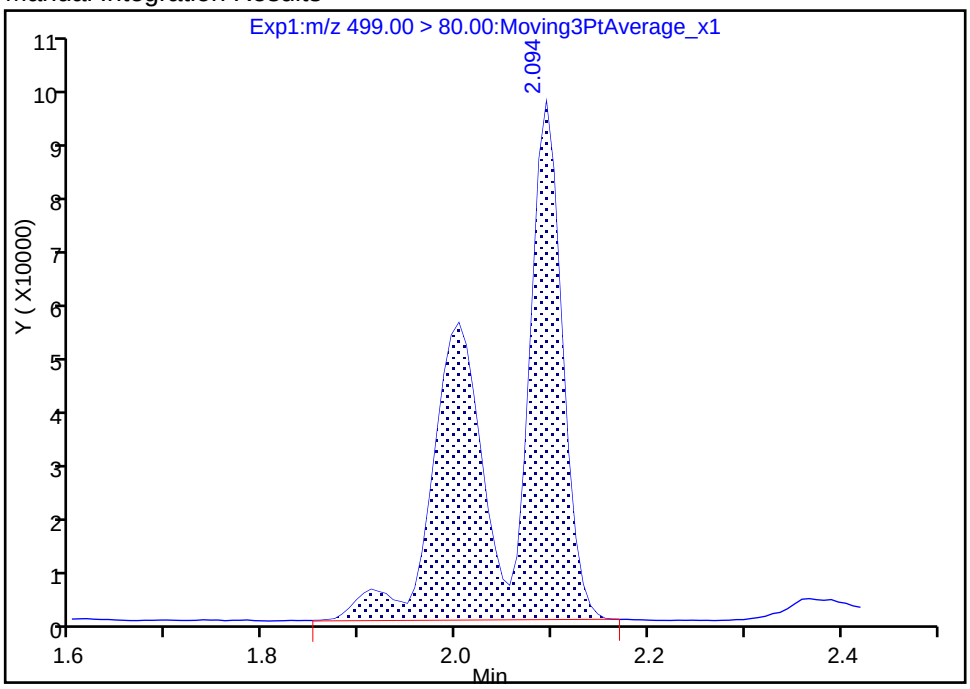
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.09
Area: 415610
Amount: 4.053148
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:37:06
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

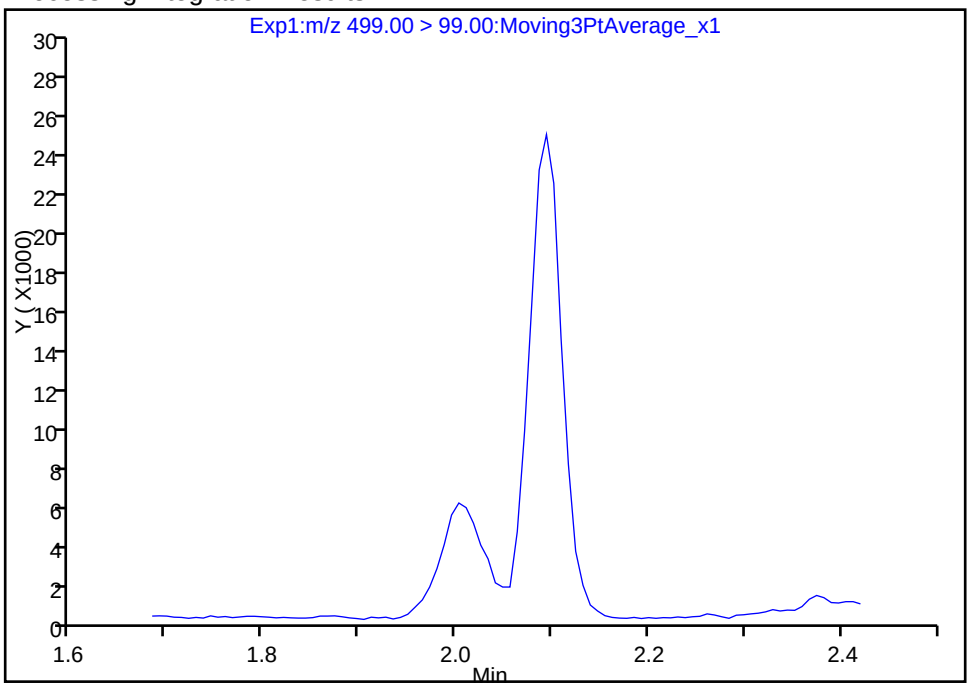
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_016.d				
Injection Date:	02-Feb-2018 15:06:12	Instrument ID:	A8_N		
Lims ID:	320-35090-A-5-A	Lab Sample ID:	320-35090-5		
Client ID:	NAWC-011518-RW-241				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	10	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 2

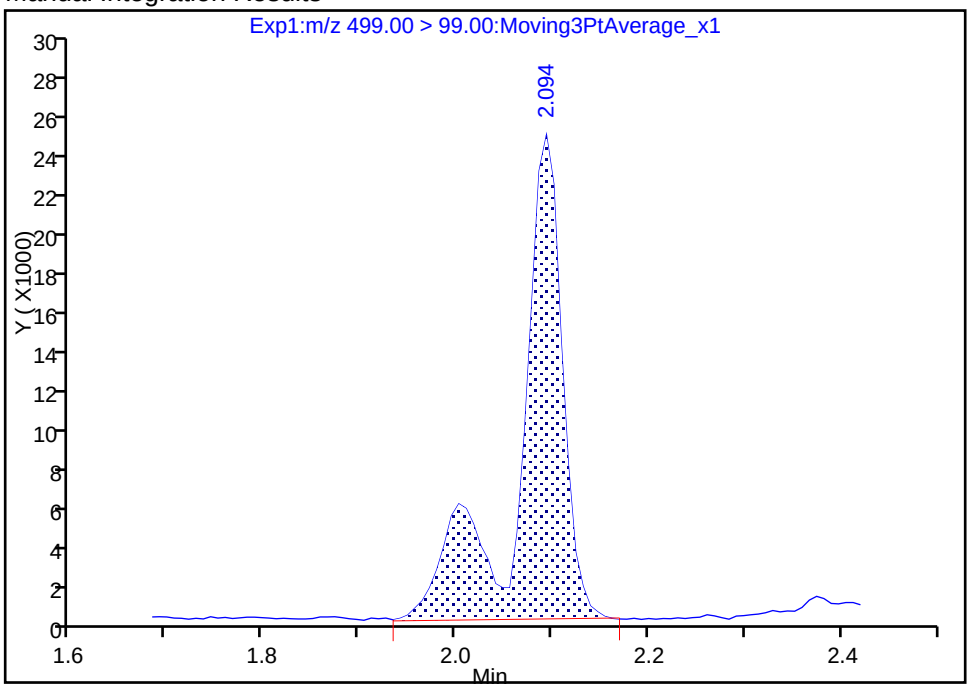
Processing Integration Results

Not Detected
Expected RT: 2.12



Manual Integration Results

RT: 2.09
Area: 76799
Amount: 4.053148
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:37:11
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

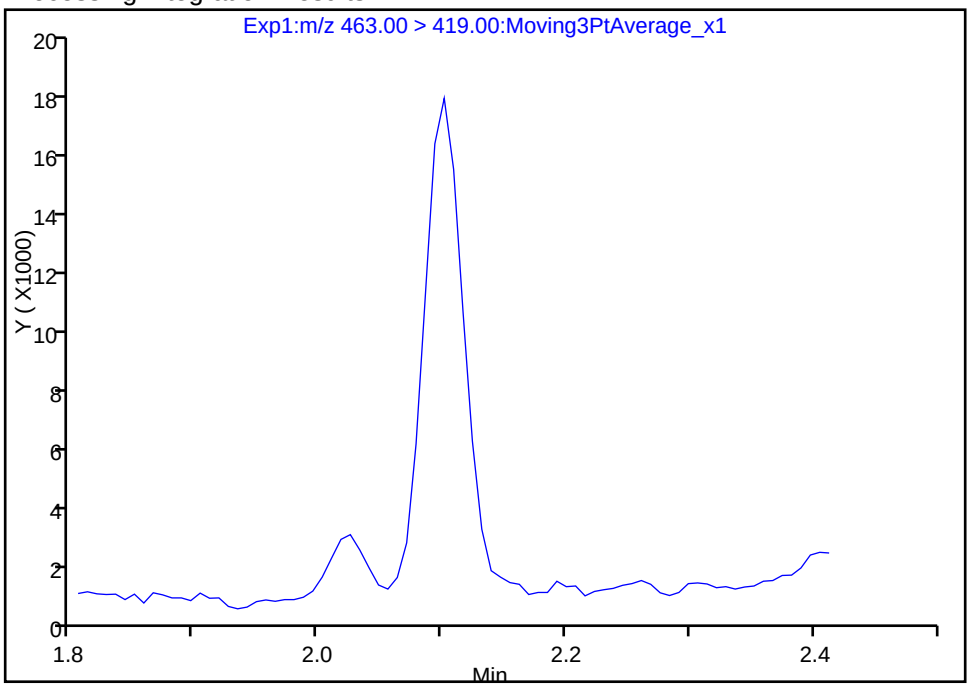
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_016.d				
Injection Date:	02-Feb-2018 15:06:12	Instrument ID:	A8_N		
Lims ID:	320-35090-A-5-A	Lab Sample ID:	320-35090-5		
Client ID:	NAWC-011518-RW-241				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	10	Worklist Smp#:	13
Injection 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

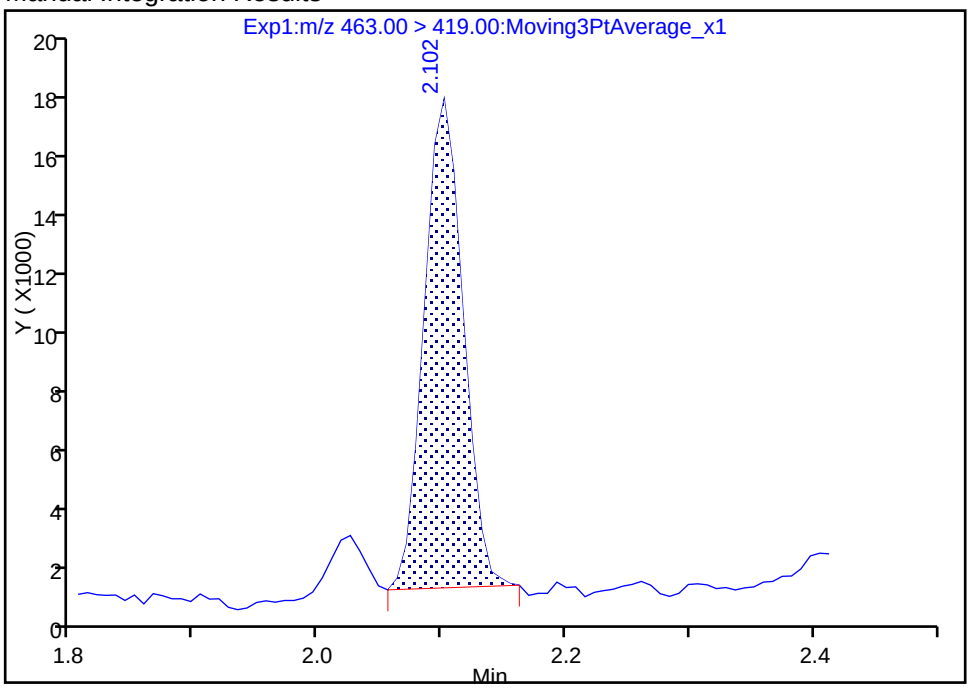
Not Detected
Expected RT: 2.10

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 34874
Amount: 0.371550
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:37:19
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-241 | Lab Sample ID: 320-35090-6

Matrix: Water | Lab File ID: 2018.02.02_537A_019.d

Analysis Method: 537 | Date Collected: 01/15/2018 09:05

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 253.2(mL) | Date Analyzed: 02/02/2018 15:20

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	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)	3.9	U	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		70-130
STL00996	13C2 PFDA	117		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_019.d
Lims ID: 320-35090-A-6-A
Client ID: NAWC-011518-FRB-241
Sample Type: Client
Inject. Date: 02-Feb-2018 15:20:13 ALS Bottle#: 11 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-6-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:49:36 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:47:23

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1558670	10.3		9095	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.844	-0.008		1381690	10.0		6431	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.094	0.0		3202154	28.7		8424	
$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1233502	11.7		9559	

Report Date: 06-Feb-2018 13:49:48 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_019.d

Injection Date: 02-Feb-2018 15:20:13 Instrument ID: A8_N

Lims ID: 320-35090-A-6-A Lab Sample ID: 320-35090-6

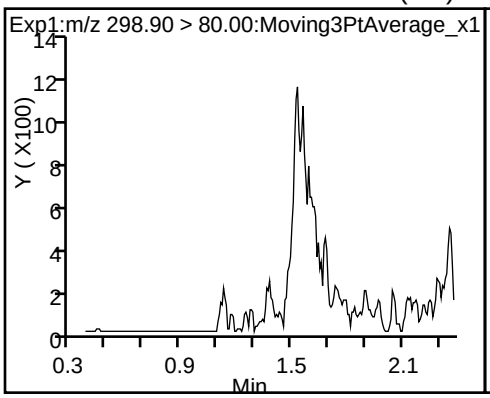
Client ID: NAWC-011518-FRB-241

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

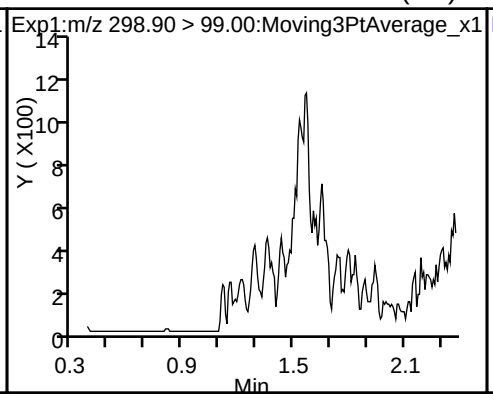
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

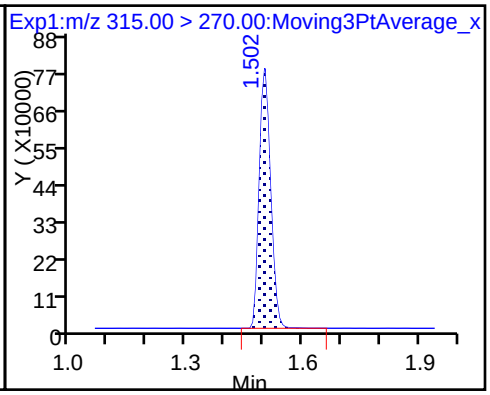
1 Perfluorobutanesulfonic acid (ND)



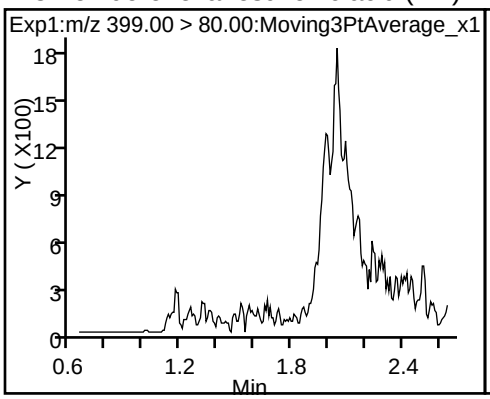
1 Perfluorobutanesulfonic acid (ND)



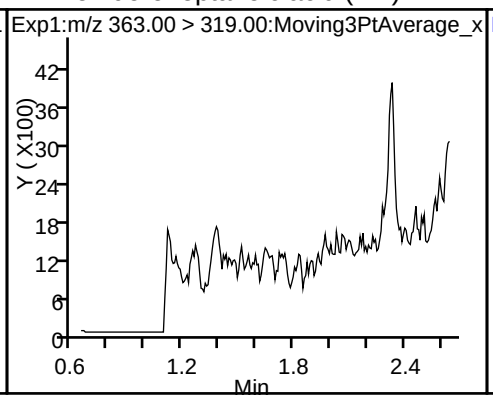
$ 2 13C2 PFHxA



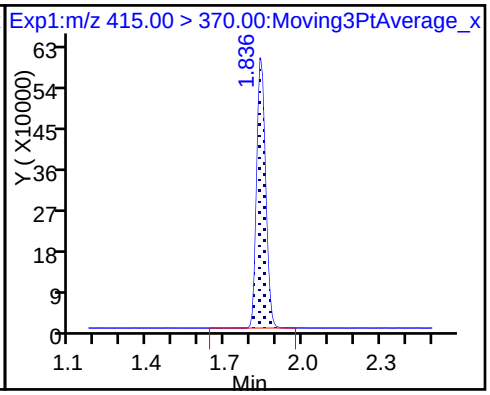
3 Perfluorohexanesulfonic acid (ND)



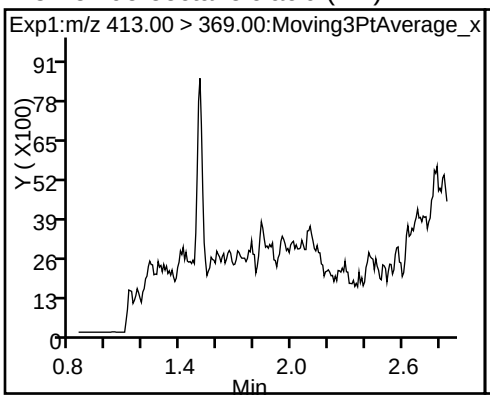
4 Perfluoroheptanoic acid (ND)



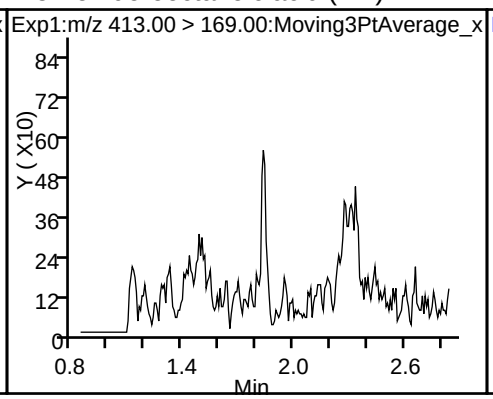
* 6 13C2-PFOA



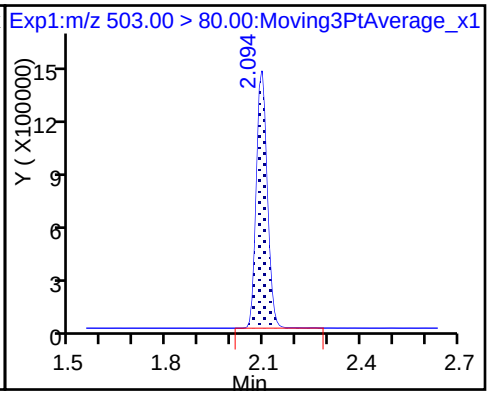
5 Perfluorooctanoic acid (ND)



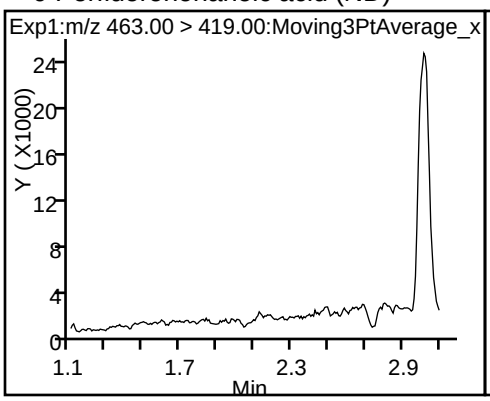
5 Perfluorooctanoic acid (ND)



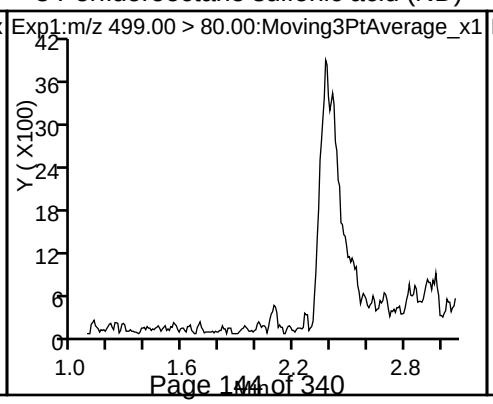
* 7 13C4 PFOS



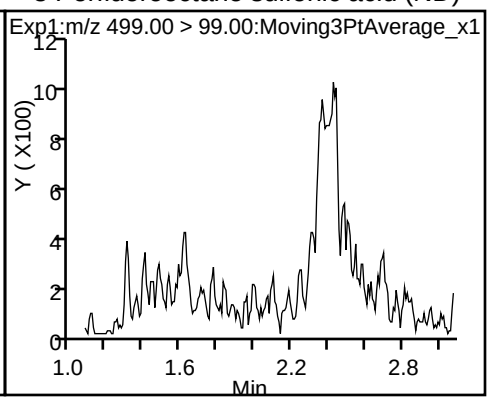
9 Perfluorononanoic acid (ND)



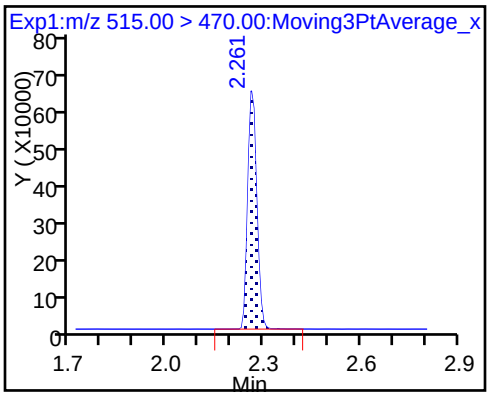
8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND)



$ 10 13C2 PFDA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Y (X10000)
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70
60
50
40
30
20
10
0
1.7
2.0
2.3
2.6
2.9
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_019.d				
Lims ID:	320-35090-A-6-A				
Client ID:	NAWC-011518-FRB-241				
Sample Type:	Client				
Inject. Date:	02-Feb-2018 15:20:13	ALS Bottle#:	11	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-35090-a-6-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	06-Feb-2018 13:49:36	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:	XAWRK055				
First Level Reviewer: hannigana		Date:	06-Feb-2018 13:47:23		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.3	102.53
$ 10 13C2 PFDA	10.0	11.7	116.67

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: WGNA-011518-RW-3385 | Lab Sample ID: 320-35090-7

Matrix: Water | Lab File ID: 2018.02.02_537A_020.d

Analysis Method: 537 | Date Collected: 01/15/2018 09:40

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 245.8(mL) | Date Analyzed: 02/02/2018 15:24

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	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)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U M	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	106		70-130
STL00996	13C2 PFDA	105		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_020.d
Lims ID: 320-35090-A-7-A
Client ID: WGNA-011518-RW-3385
Sample Type: Client
Inject. Date: 02-Feb-2018 15:24:55 ALS Bottle#: 12 Worklist Smp#: 17
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-7-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:49:36 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:39:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									M
298.90 > 80.00	1.373	1.381	-0.008	1.000	58719	0.4682		75.3	M
298.90 > 99.00	1.373	1.381	-0.008	1.000	42471		1.38(0.00-0.00)	67.1	M
$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.502	-0.007	1.000	1626083	10.6		8286	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.639	1.646	-0.007	1.000	149855	0.7984		109	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.639	1.646	-0.007	1.000	145415	1.11		33.8	
* 6 13C2-PFOA									
415.00 > 370.00	1.828	1.844	-0.016		1395726	10.0		6424	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.828	1.844	-0.016	1.000	444704	3.44		64.6	
413.00 > 169.00	1.828	1.844	-0.016	1.000	274136		1.62(0.00-0.00)	725	
* 7 13C4 PFOS									
503.00 > 80.00	2.086	2.094	-0.008		3215283	28.7		5247	
9 Perfluorononanoic acid									M
463.00 > 419.00	2.094	2.102	-0.008	1.000	30841	0.3327		5.9	M
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.086	2.124	-0.038	1.000	386456	3.67		170	M
499.00 > 99.00	2.086	2.124	-0.038	1.000	68728		5.62(0.00-0.00)	109	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1121467	10.5		7937	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 06-Feb-2018 13:49:49 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_020.d

Injection Date: 02-Feb-2018 15:24:55 Instrument ID: A8_N

Lims ID: 320-35090-A-7-A Lab Sample ID: 320-35090-7

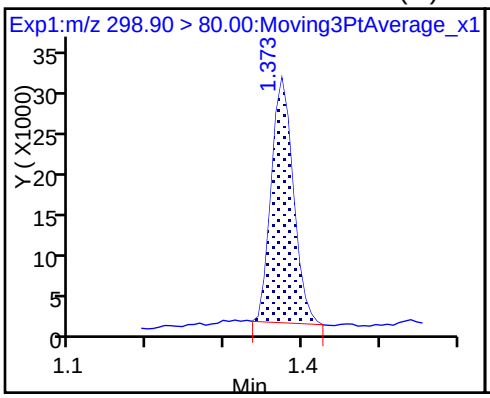
Client ID: WGNA-011518-RW-3385

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

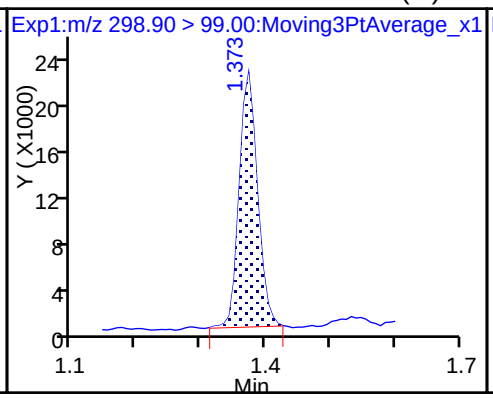
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

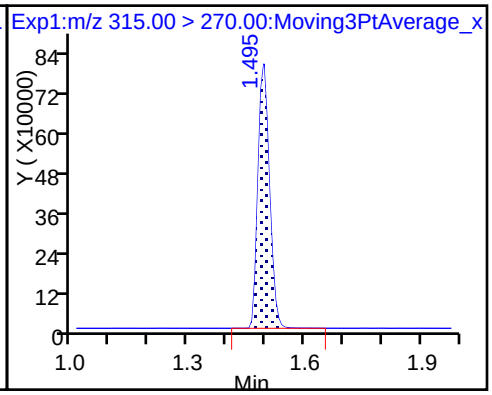
1 Perfluorobutanesulfonic acid (M)



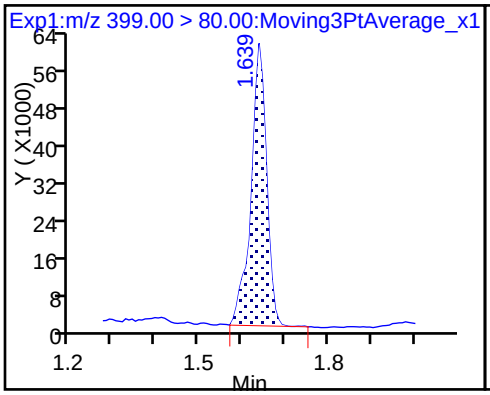
1 Perfluorobutanesulfonic acid (M)



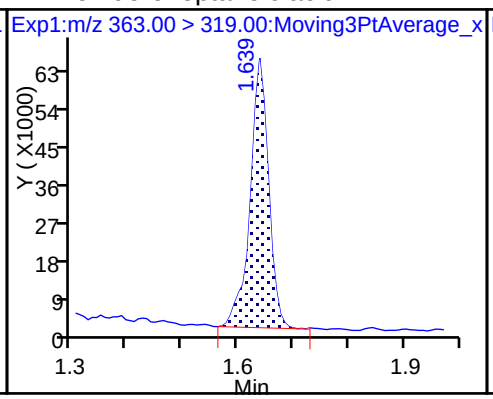
$ 2 13C2 PFHxA



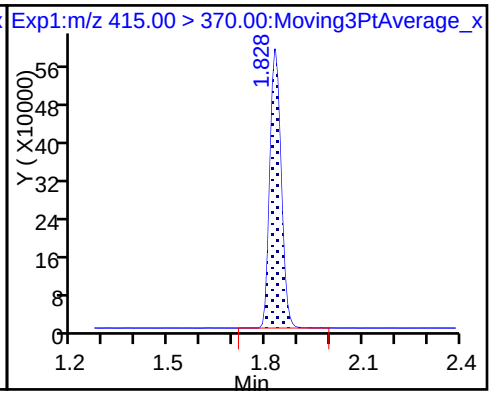
3 Perfluorohexanesulfonic acid



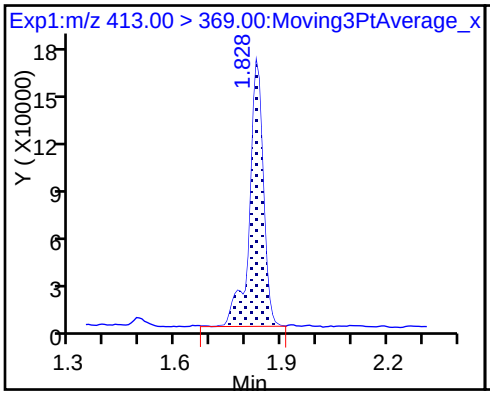
4 Perfluoroheptanoic acid



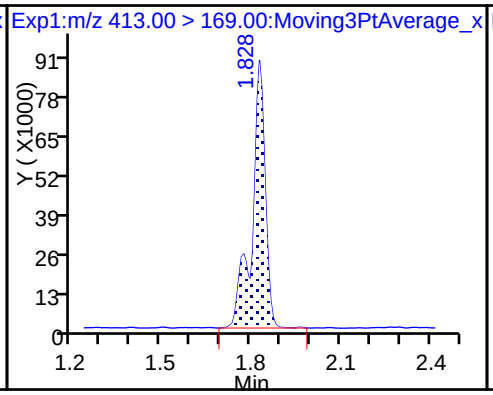
* 6 13C2-PFOA



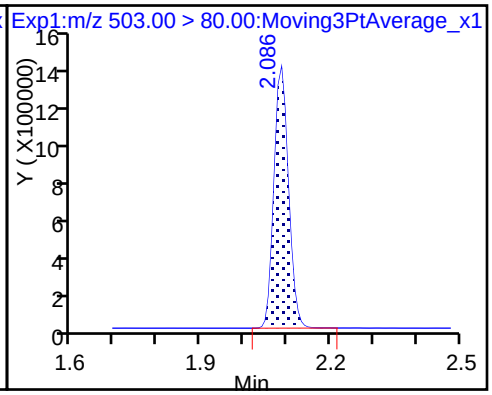
5 Perfluorooctanoic acid



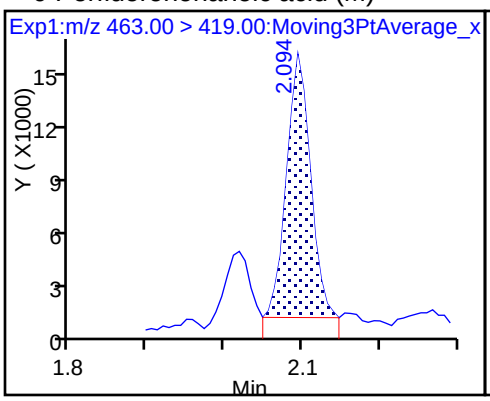
5 Perfluorooctanoic acid



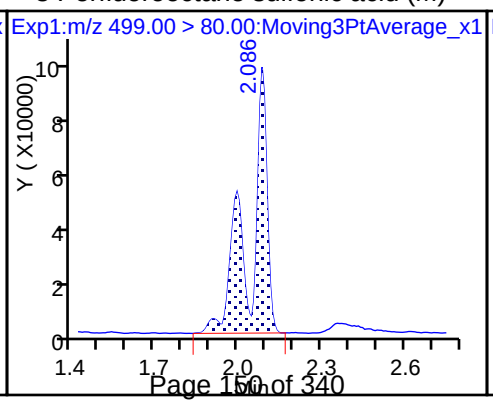
* 7 13C4 PFOS



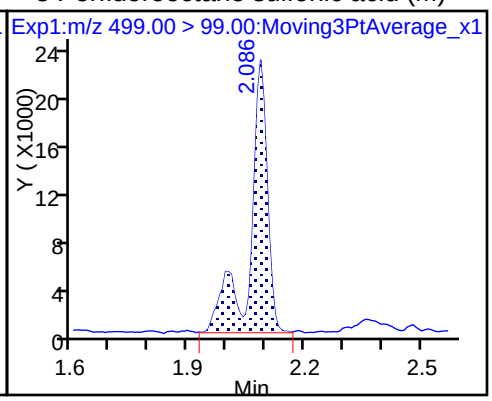
9 Perfluorononanoic acid (M)



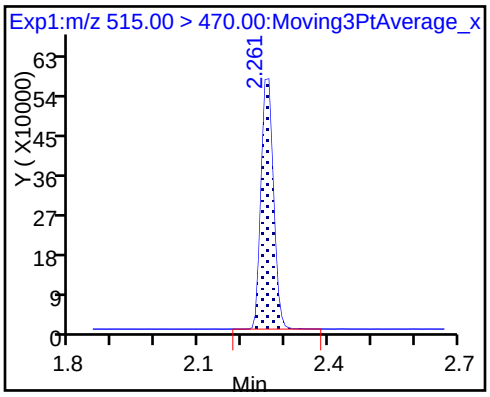
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid (M)



$ 10 13C2 PFDA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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\20180202-53640.b\2018.02.02_537A_020.d
Lims ID: 320-35090-A-7-A
Client ID: WGNA-011518-RW-3385
Sample Type: Client
Inject. Date: 02-Feb-2018 15:24:55 ALS Bottle#: 12 Worklist Smp#: 17
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-7-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:49:36 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:39:17

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.6	105.89
$ 10 13C2 PFDA	10.0	10.5	105.00

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

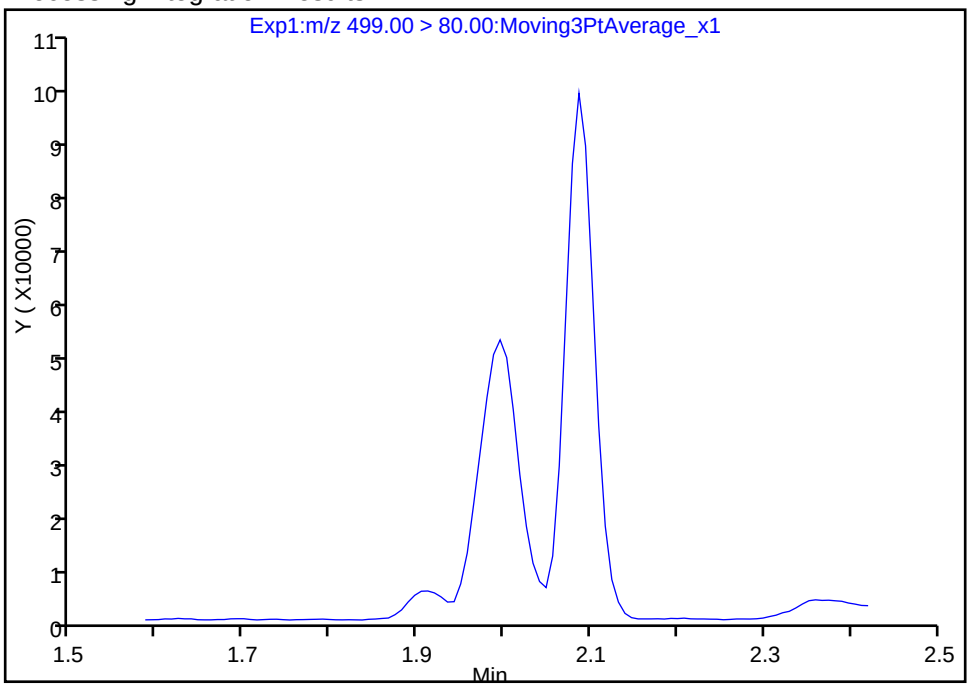
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_020.d				
Injection Date:	02-Feb-2018 15:24:55	Instrument ID:	A8_N		
Lims ID:	320-35090-A-7-A	Lab Sample ID:	320-35090-7		
Client ID:	WGNA-011518-RW-3385				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	12	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

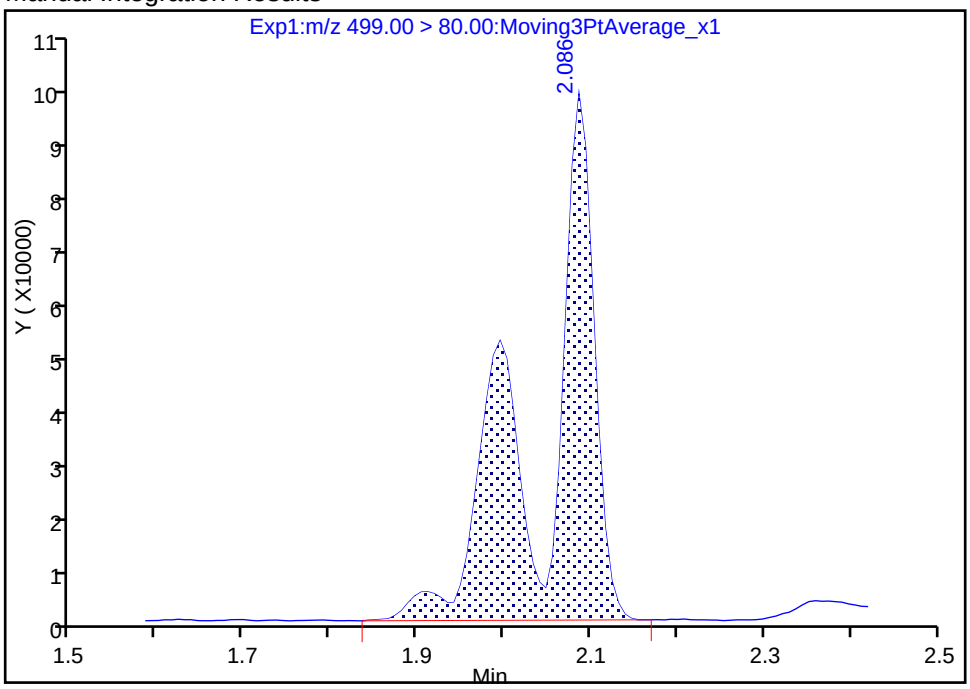
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.09
Area: 386456
Amount: 3.671285
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:39:00
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

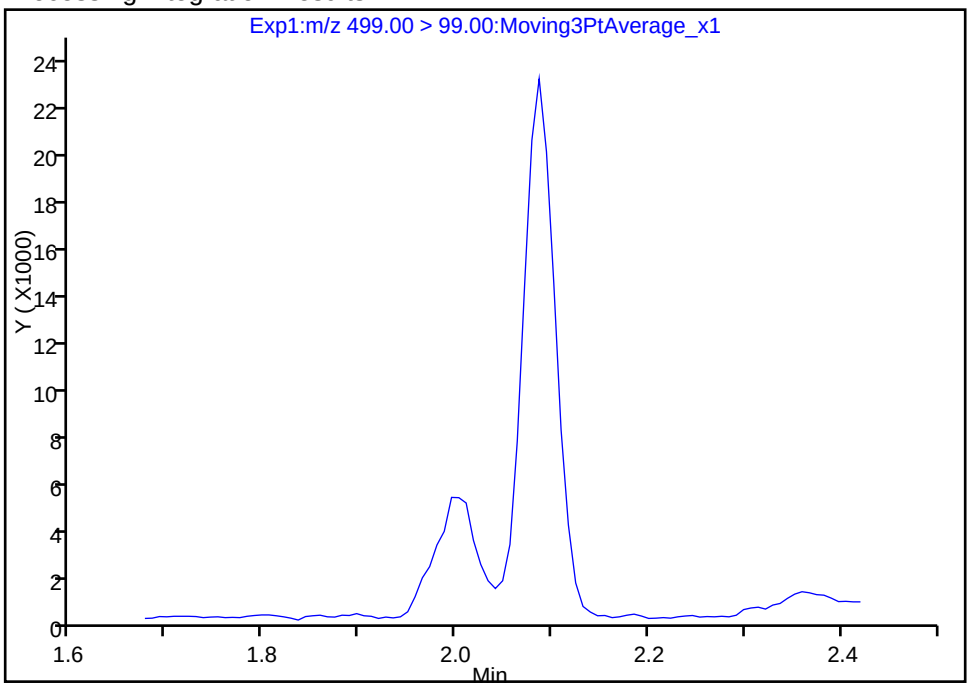
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_020.d				
Injection Date:	02-Feb-2018 15:24:55	Instrument ID:	A8_N		
Lims ID:	320-35090-A-7-A	Lab Sample ID:	320-35090-7		
Client ID:	WGNA-011518-RW-3385				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	12	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 2

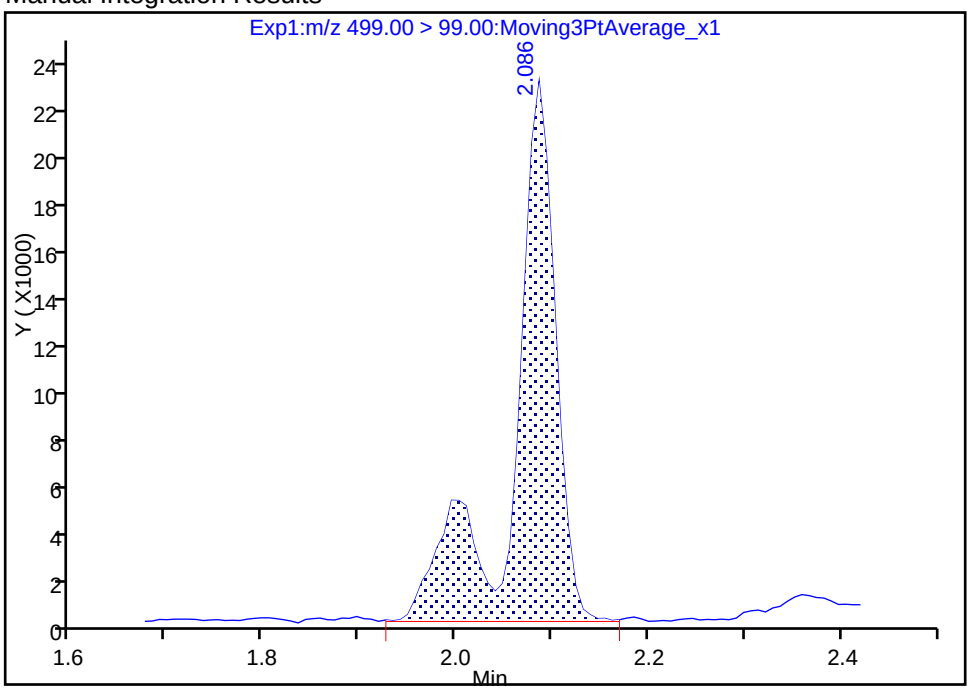
Processing Integration Results

Not Detected
Expected RT: 2.12



Manual Integration Results

RT: 2.09
Area: 68728
Amount: 3.671285
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:39:04
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

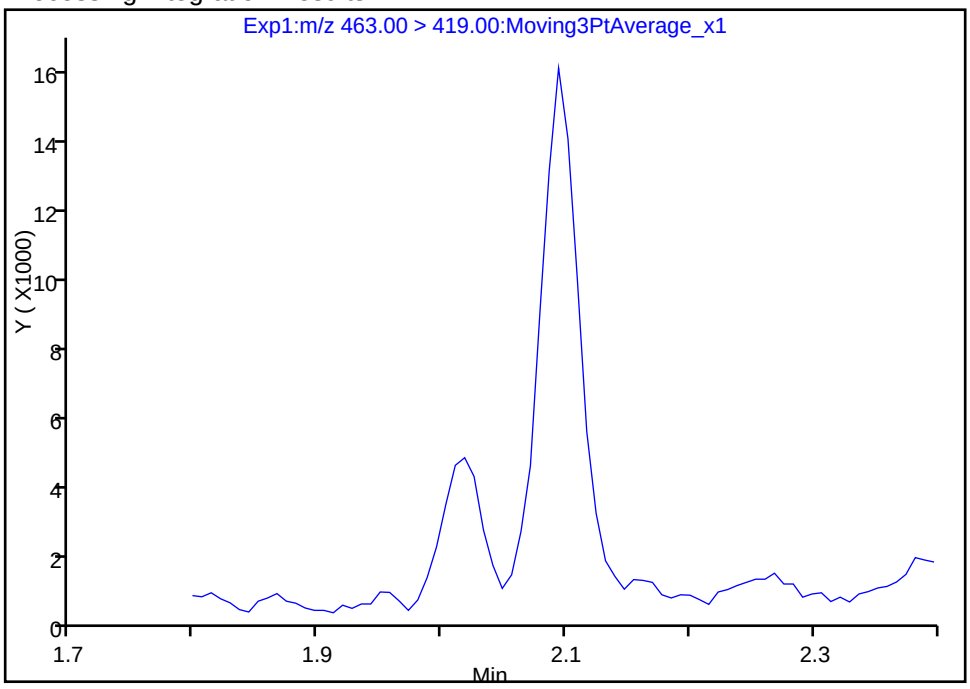
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_020.d				
Injection Date:	02-Feb-2018 15:24:55	Instrument ID:	A8_N		
Lims ID:	320-35090-A-7-A	Lab Sample ID:	320-35090-7		
Client ID:	WGNA-011518-RW-3385				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	12	Worklist Smp#:	17
Injection 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

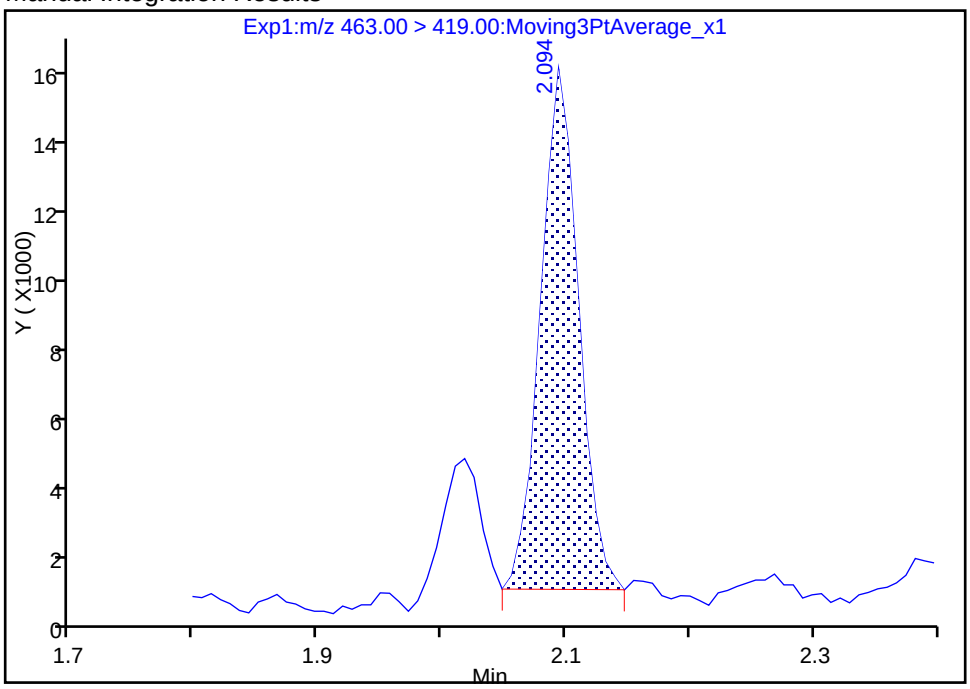
Not Detected
Expected RT: 2.10

Processing Integration Results



Manual Integration Results

RT: 2.09
Area: 30841
Amount: 0.332702
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:39:12
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

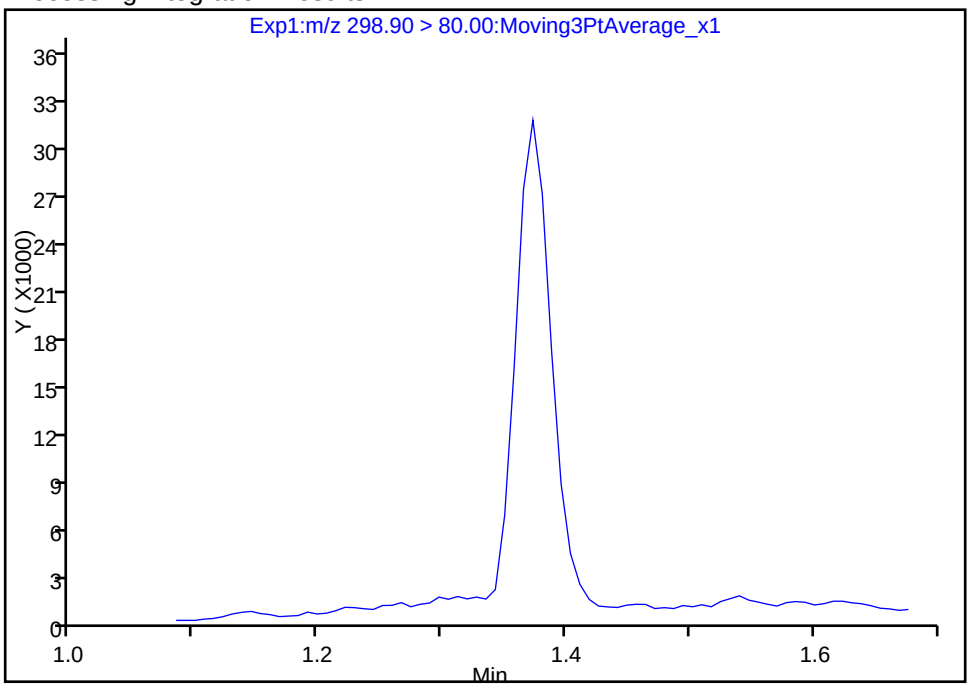
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_020.d				
Injection Date:	02-Feb-2018 15:24:55	Instrument ID:	A8_N		
Lims ID:	320-35090-A-7-A	Lab Sample ID:	320-35090-7		
Client ID:	WGNA-011518-RW-3385				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	12	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

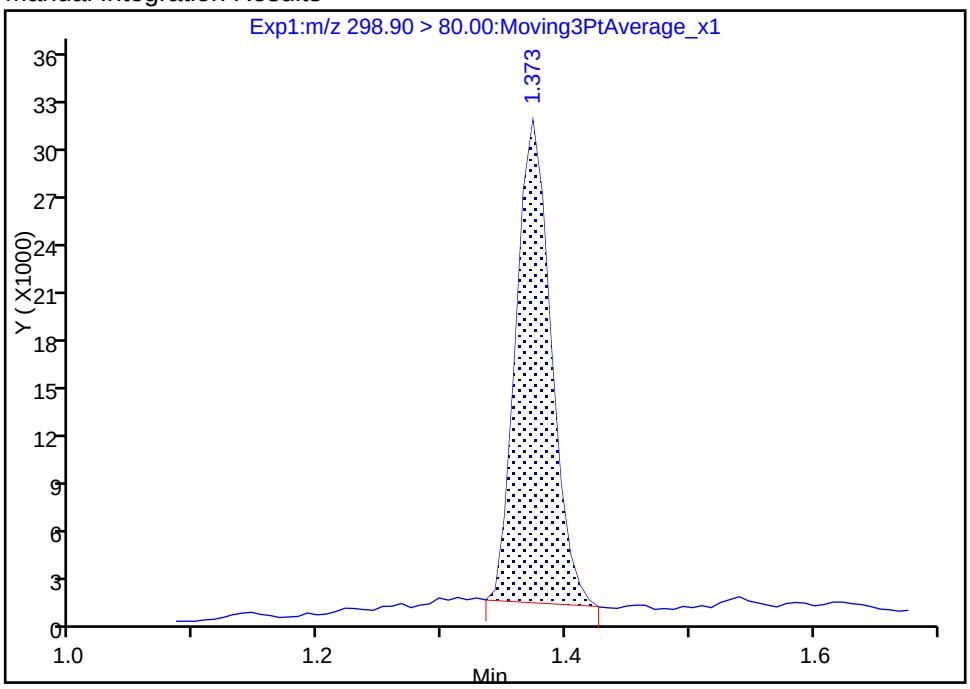
Not Detected
Expected RT: 1.38

Processing Integration Results



Manual Integration Results

RT: 1.37
Area: 58719
Amount: 0.468236
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:38:47
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

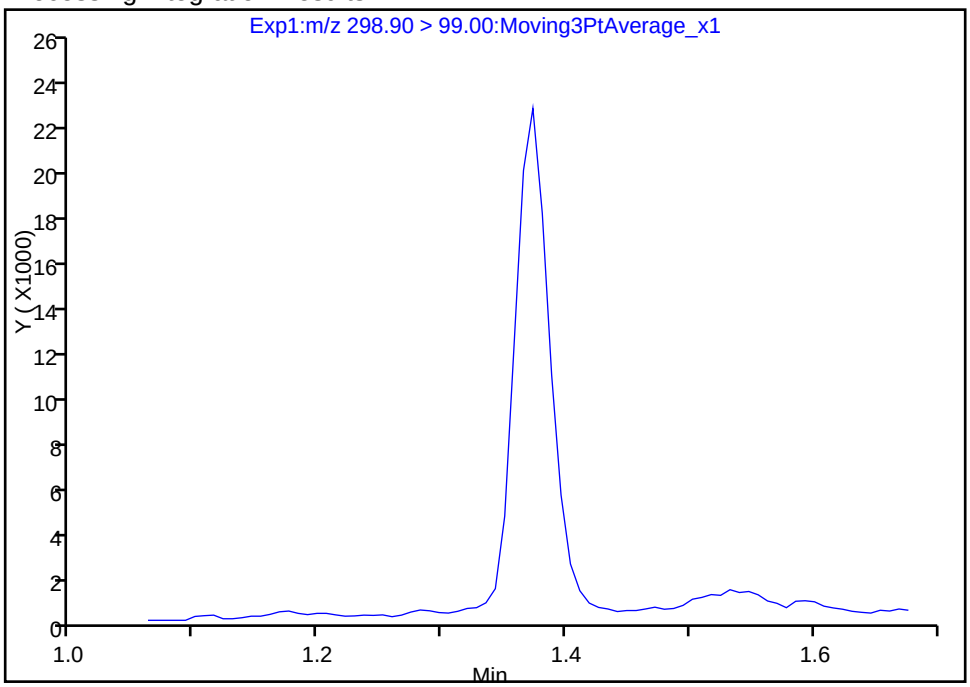
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_020.d				
Injection Date:	02-Feb-2018 15:24:55	Instrument ID:	A8_N		
Lims ID:	320-35090-A-7-A	Lab Sample ID:	320-35090-7		
Client ID:	WGNA-011518-RW-3385				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	12	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

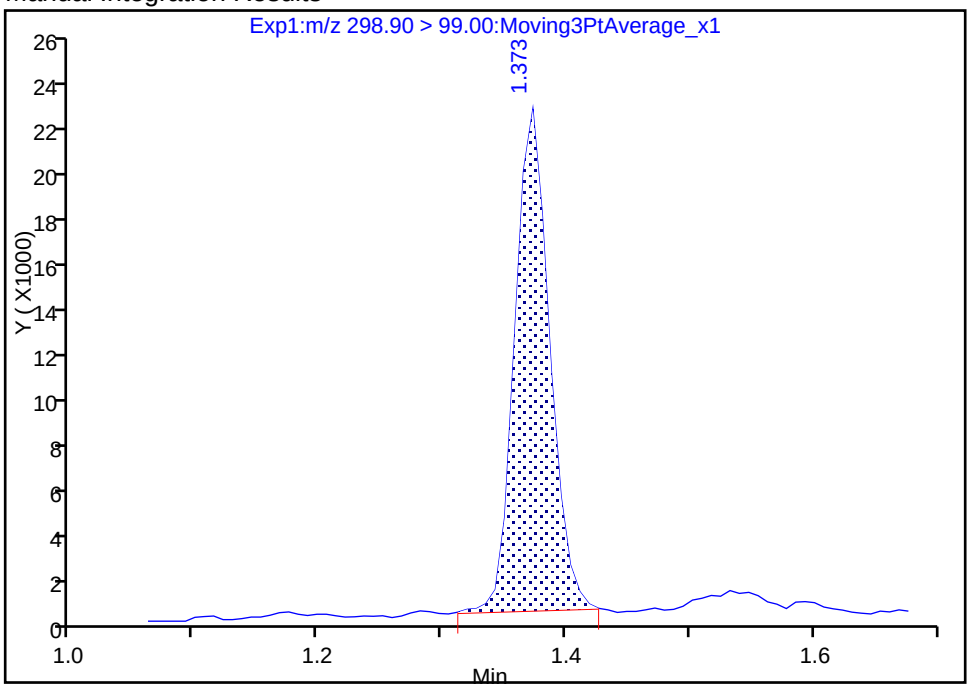
Not Detected
Expected RT: 1.38

Processing Integration Results



Manual Integration Results

RT: 1.37
Area: 42471
Amount: 0.468236
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:38:53
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: WGNA-011518-FRB-3385 | Lab Sample ID: 320-35090-8

Matrix: Water | Lab File ID: 2018.02.02_537A_021.d

Analysis Method: 537 | Date Collected: 01/15/2018 09:35

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 250.1(mL) | Date Analyzed: 02/02/2018 15:29

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

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

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

Analysis Batch No.: 206762 | 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	102		70-130
STL00996	13C2 PFDA	98		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_021.d
Lims ID: 320-35090-A-8-A
Client ID: WGNA-011518-FRB-3385
Sample Type: Client
Inject. Date: 02-Feb-2018 15:29:36 ALS Bottle#: 13 Worklist Smp#: 18
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-8-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:49:36 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:47:48

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.502	-0.007	1.000	1656113	10.2		10479	
* 6 13C2-PFOA									
415.00 > 370.00	1.828	1.844	-0.016		1471505	10.0		7300	
* 7 13C4 PFOS									
503.00 > 80.00	2.086	2.094	-0.008		3214406	28.7		8186	
$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1105663	9.82		8023	

Report Date: 06-Feb-2018 13:49:50 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_021.d

Injection Date: 02-Feb-2018 15:29:36 Instrument ID: A8_N

Lims ID: 320-35090-A-8-A Lab Sample ID: 320-35090-8

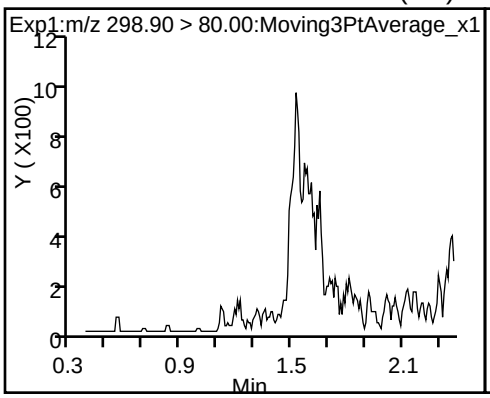
Client ID: WGNA-011518-FRB-3385

Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 18

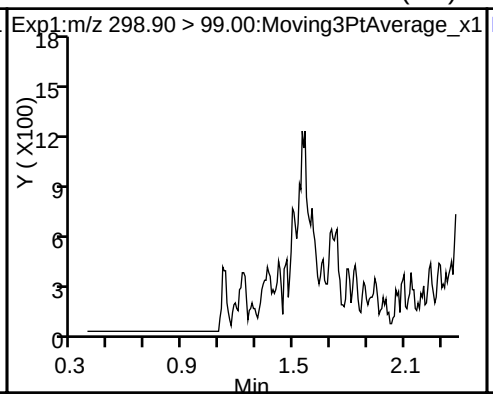
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

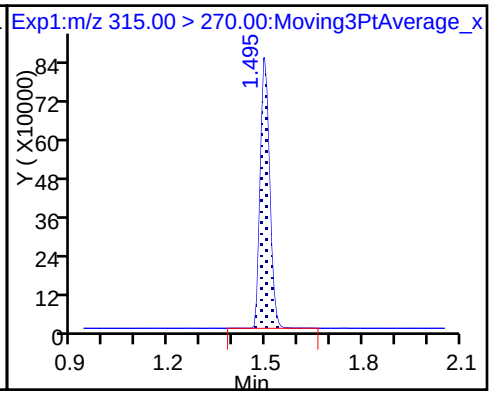
1 Perfluorobutanesulfonic acid (ND)



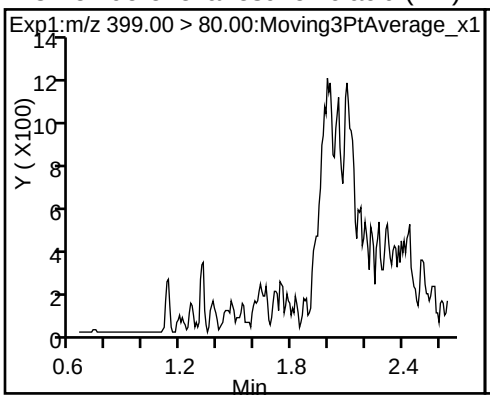
1 Perfluorobutanesulfonic acid (ND)



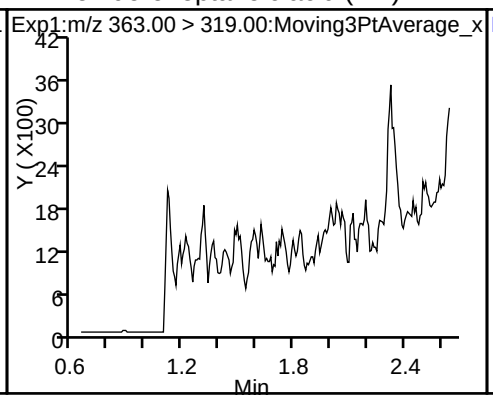
$ 2 13C2 PFHxA



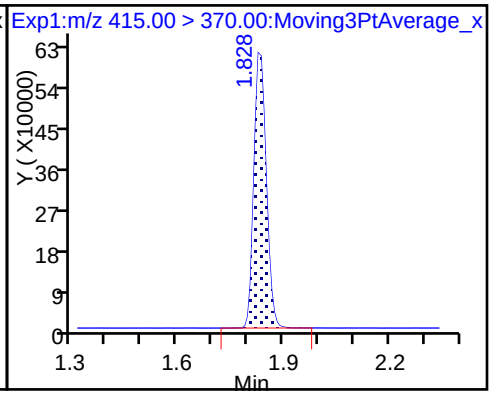
3 Perfluorohexanesulfonic acid (ND)



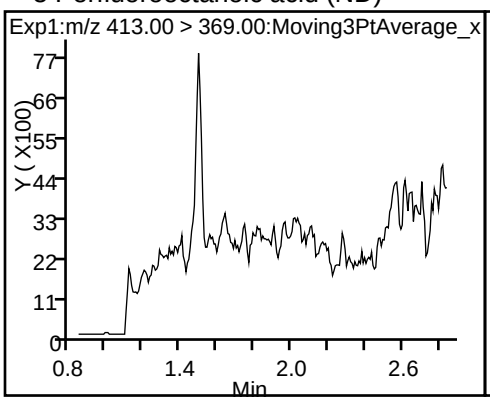
4 Perfluoroheptanoic acid (ND)



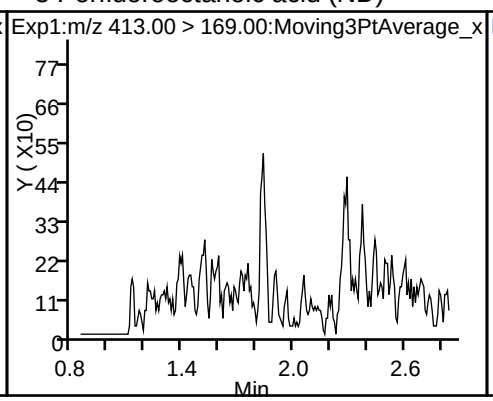
* 6 13C2-PFOA



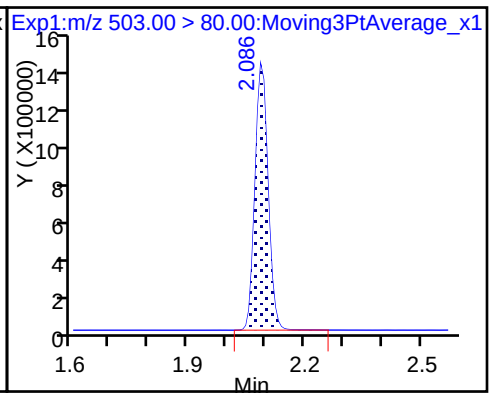
5 Perfluorooctanoic acid (ND)



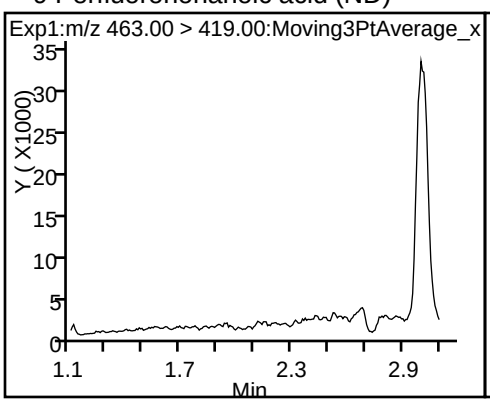
5 Perfluorooctanoic acid (ND)



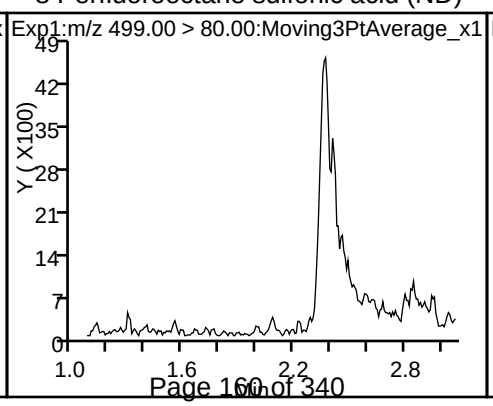
* 7 13C4 PFOS



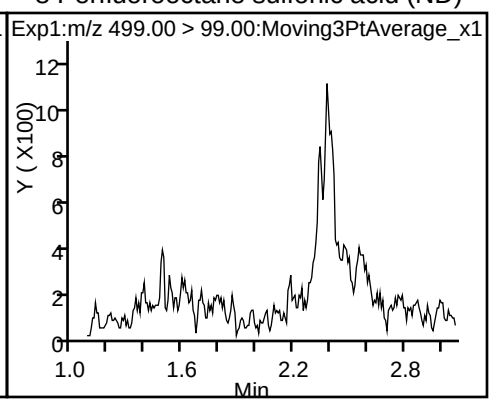
9 Perfluorononanoic acid (ND)



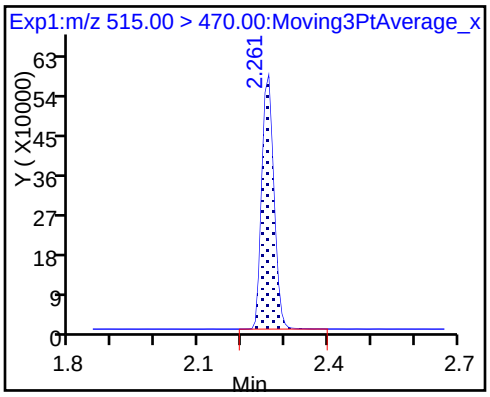
8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.261
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\20180202-53640.b\2018.02.02_537A_021.d				
Lims ID:	320-35090-A-8-A				
Client ID:	WGNA-011518-FRB-3385				
Sample Type:	Client				
Inject. Date:	02-Feb-2018 15:29:36	ALS Bottle#:	13	Worklist Smp#:	18
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-35090-a-8-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	06-Feb-2018 13:49:36	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:	XAWRK055				
First Level Reviewer: hannigana		Date:	06-Feb-2018 13:47:48		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.2	102.29
$ 10 13C2 PFDA	10.0	9.82	98.19

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: WGNA-011518-DUP19 | Lab Sample ID: 320-35090-9

Matrix: Water | Lab File ID: 2018.02.02_537A_022.d

Analysis Method: 537 | Date Collected: 01/15/2018 07:00

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 247.1(mL) | Date Analyzed: 02/02/2018 15:34

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	J M	40	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)	12	U	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5	J	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	103		70-130
STL00996	13C2 PFDA	110		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_022.d
Lims ID: 320-35090-A-9-A
Client ID: WGNA-011518-DUP19
Sample Type: Client
Inject. Date: 02-Feb-2018 15:34:18 ALS Bottle#: 14 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-9-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:49:36 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:40:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	62330	0.5043		79.0	
298.90 > 99.00	1.381	1.381	0.0	1.000	43863		1.42(0.00-0.00)	70.9	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1609137	10.3		8288	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.646	1.646	0.0	1.000	150816	0.8152		118	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.646	1.646	0.0	1.000	146904	1.10		30.4	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.844	-0.008		1425511	10.0		7220	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.836	1.844	-0.008	1.000	460266	3.49		65.1	
413.00 > 169.00	1.836	1.844	-0.008	1.000	271868		1.69(0.00-0.00)	676	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.094	0.0		3169341	28.7		4946	
9 Perfluorononanoic acid									M
463.00 > 419.00	2.102	2.102	0.0	1.000	29037	0.3067		5.4	M
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.094	2.124	-0.030	1.000	414540	4.00		170	M
499.00 > 99.00	2.094	2.124	-0.030	1.000	68426		6.06(0.00-0.00)	109	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1200992	11.0		9151	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 06-Feb-2018 13:49:51 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_022.d

Injection Date: 02-Feb-2018 15:34:18 Instrument ID: A8_N

Lims ID: 320-35090-A-9-A Lab Sample ID: 320-35090-9

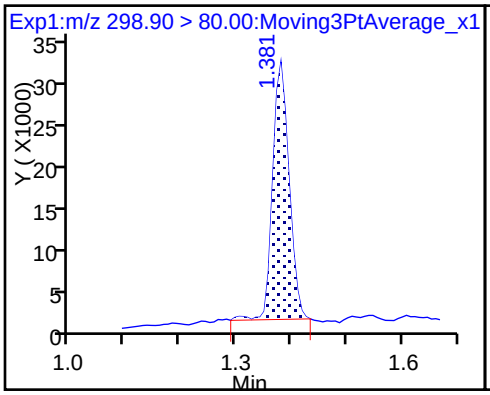
Client ID: WGNA-011518-DUP19

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

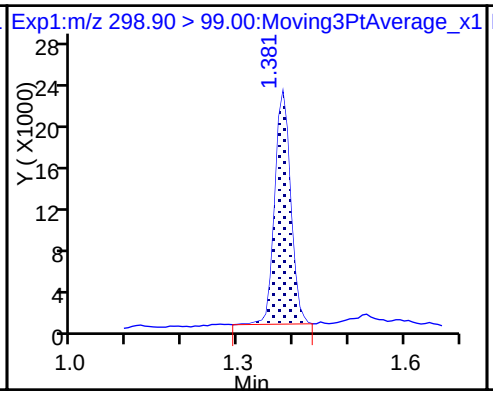
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

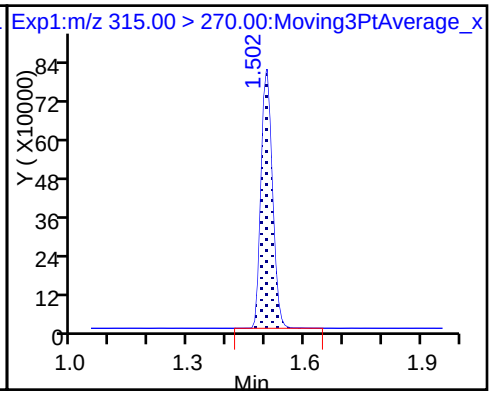
1 Perfluorobutanesulfonic acid



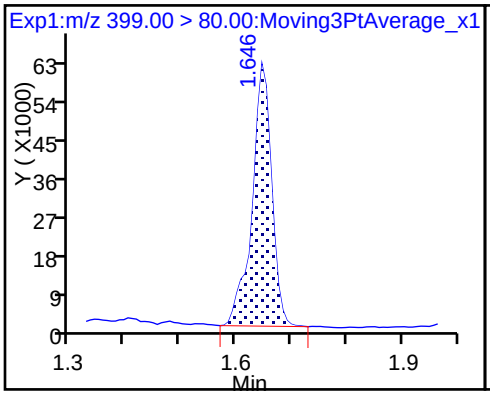
1 Perfluorobutanesulfonic acid



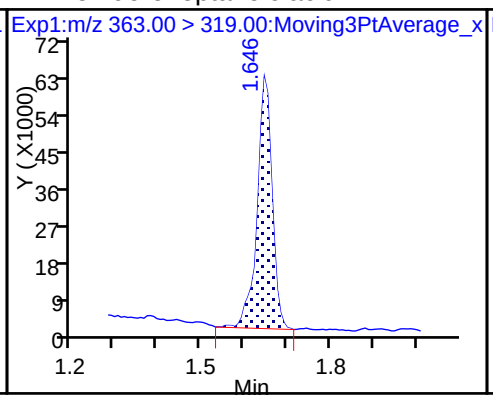
$ 2 13C2 PFHxA



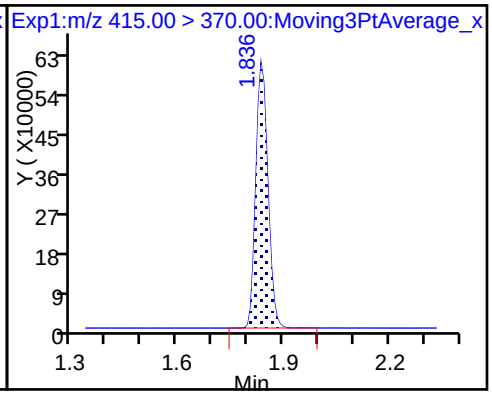
3 Perfluorohexanesulfonic acid



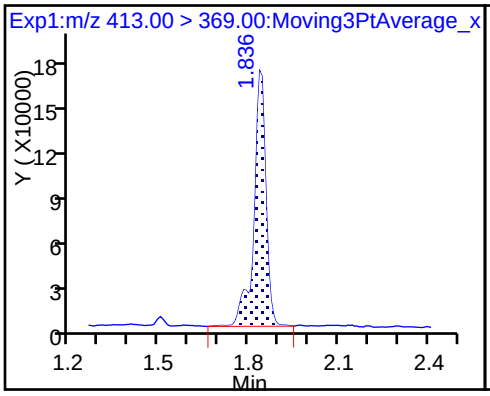
4 Perfluoroheptanoic acid



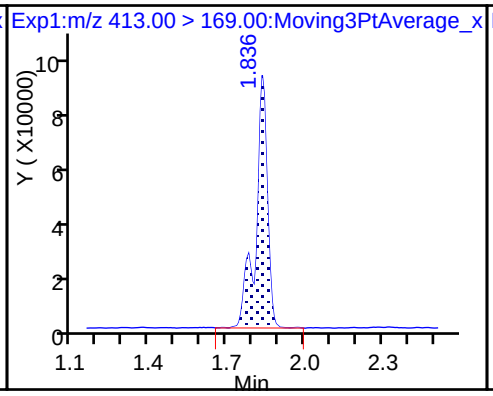
* 6 13C2-PFOA



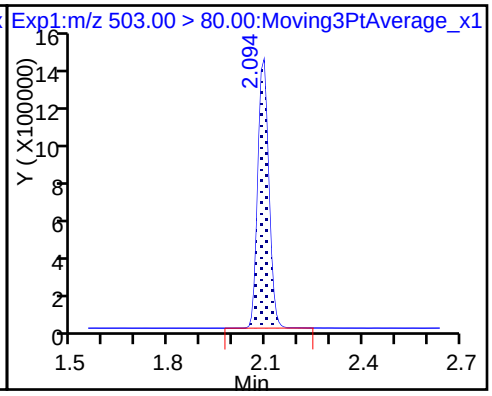
5 Perfluorooctanoic acid



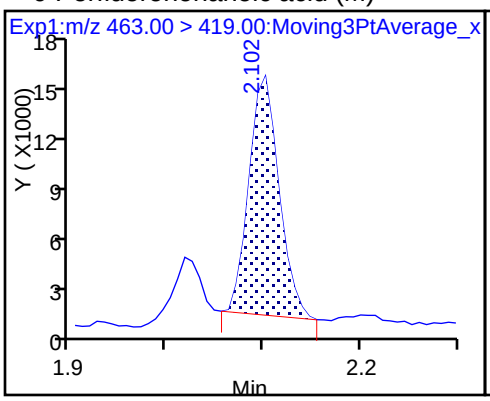
5 Perfluorooctanoic acid



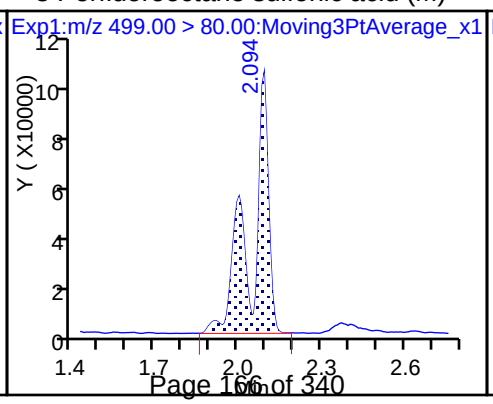
* 7 13C4 PFOS



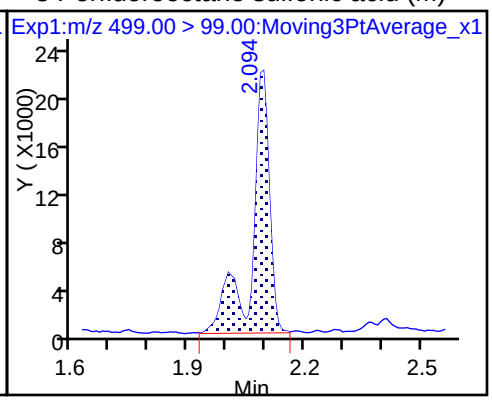
9 Perfluorononanoic acid (M)



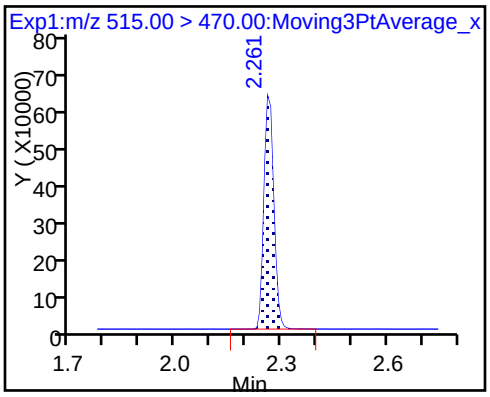
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.261
Y (X10000)
80
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\20180202-53640.b\2018.02.02_537A_022.d
Lims ID: 320-35090-A-9-A
Client ID: WGNA-011518-DUP19
Sample Type: Client
Inject. Date: 02-Feb-2018 15:34:18 ALS Bottle#: 14 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-9-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:49:36 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:40:22

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.3	102.59
$ 10 13C2 PFDA	10.0	11.0	110.10

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

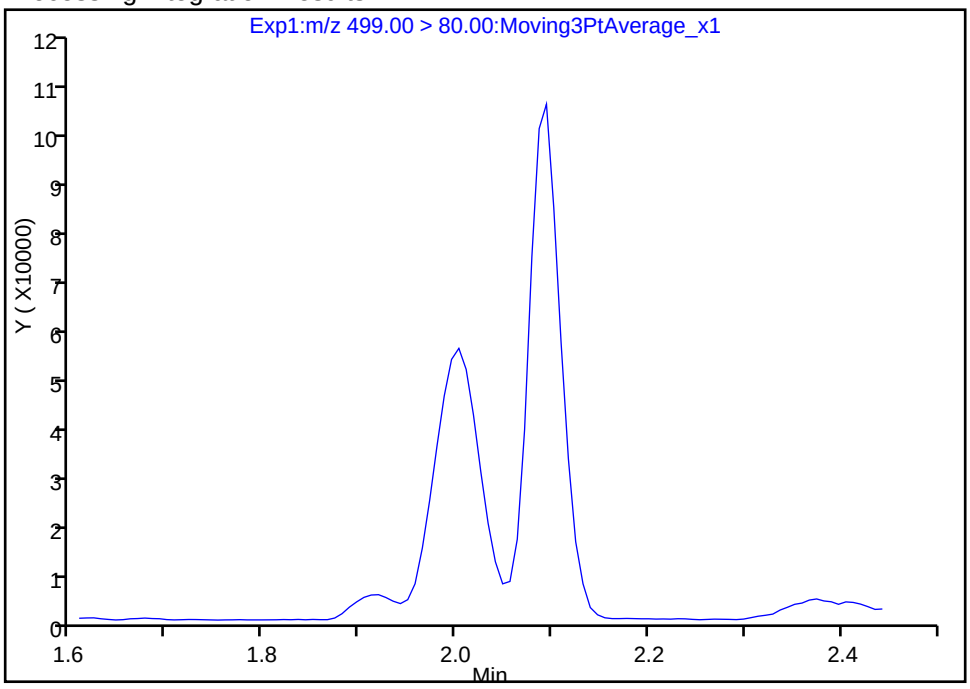
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_022.d				
Injection Date:	02-Feb-2018 15:34:18	Instrument ID:	A8_N		
Lims ID:	320-35090-A-9-A	Lab Sample ID:	320-35090-9		
Client ID:	WGNA-011518-DUP19				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	14	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

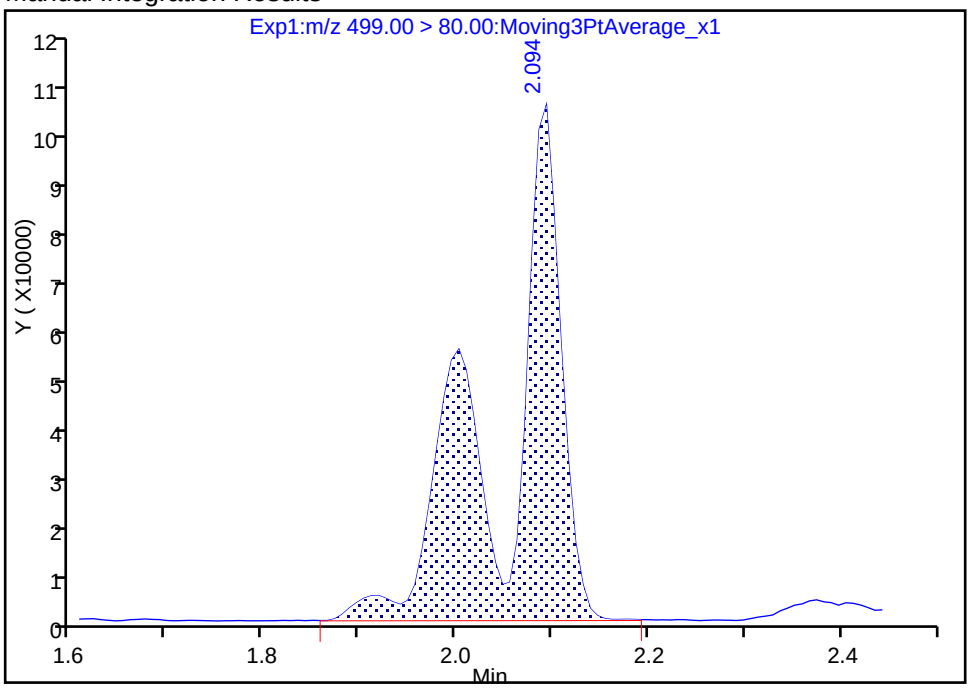
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.09
Area: 414540
Amount: 3.995165
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:39:34
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

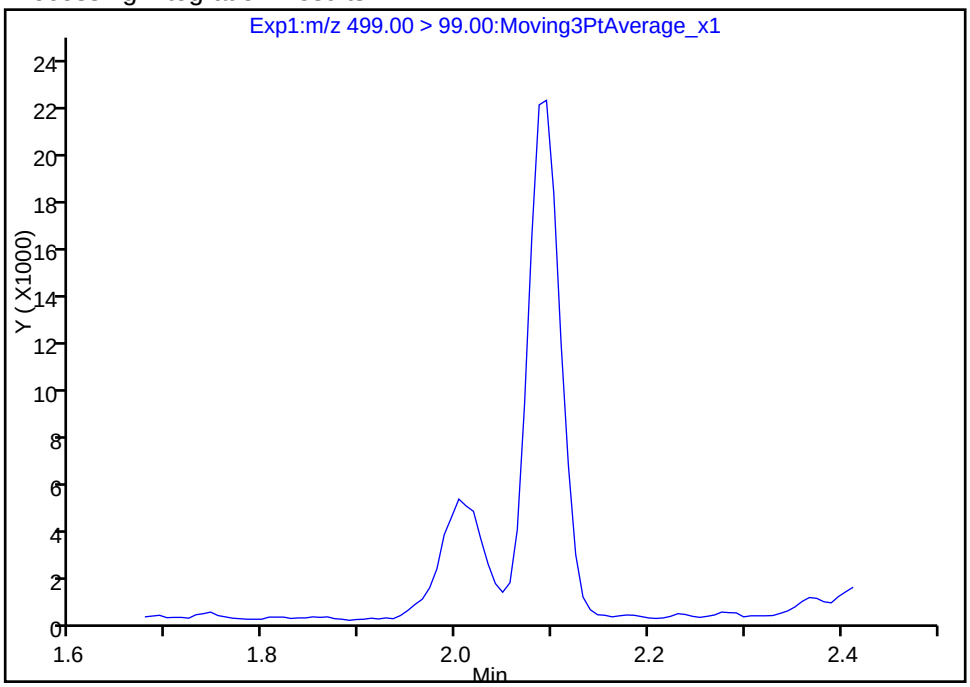
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_022.d				
Injection Date:	02-Feb-2018 15:34:18	Instrument ID:	A8_N		
Lims ID:	320-35090-A-9-A	Lab Sample ID:	320-35090-9		
Client ID:	WGNA-011518-DUP19				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	14	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 2

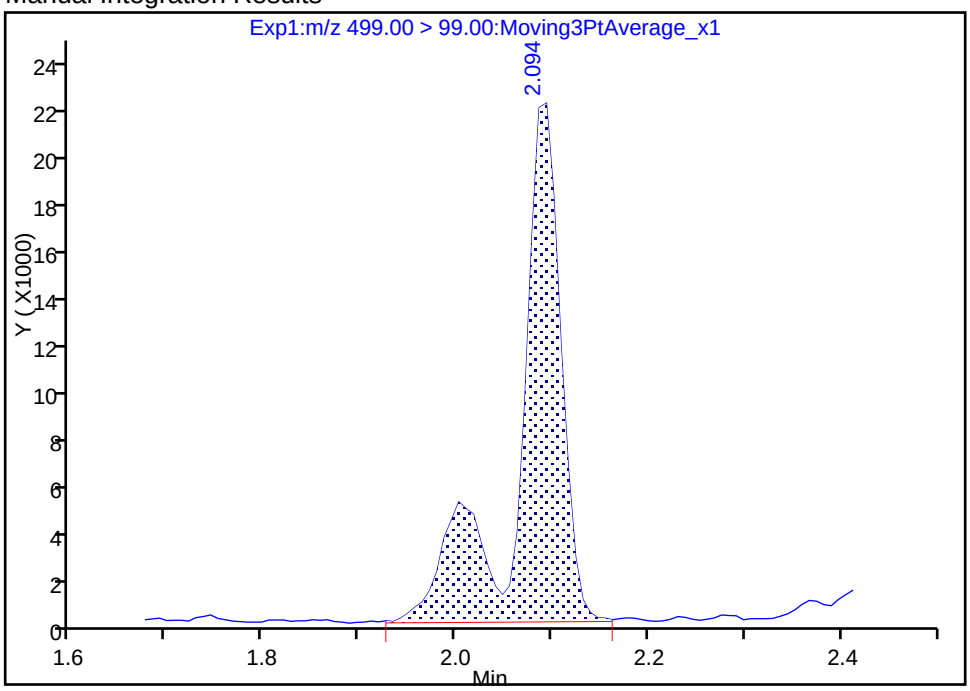
Processing Integration Results

Not Detected
Expected RT: 2.12



Manual Integration Results

RT: 2.09
Area: 68426
Amount: 3.995165
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:39:37
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

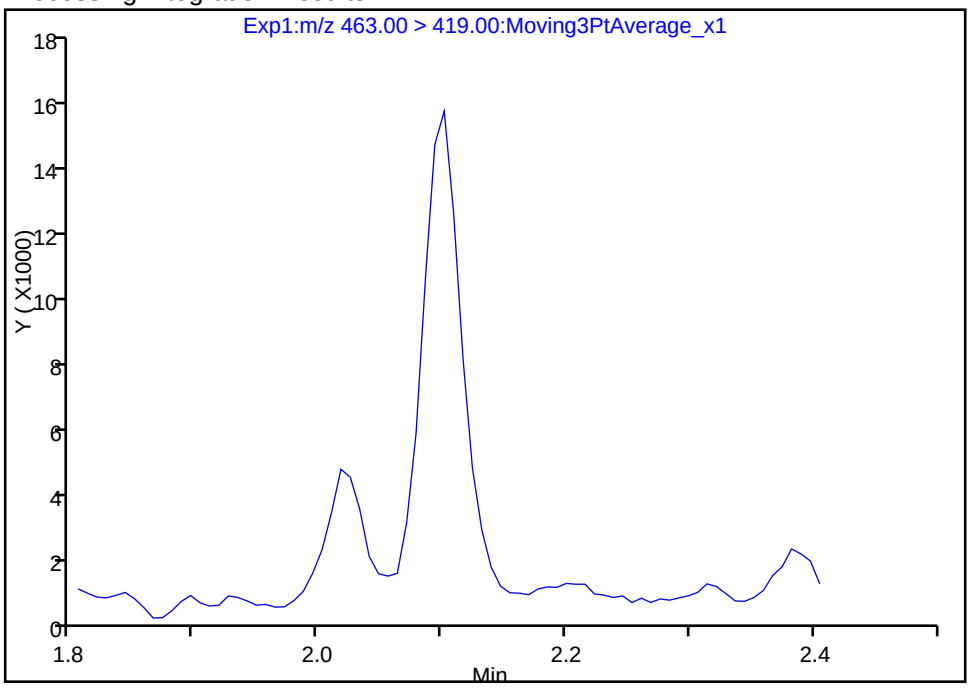
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_022.d				
Injection Date:	02-Feb-2018 15:34:18	Instrument ID:	A8_N		
Lims ID:	320-35090-A-9-A	Lab Sample ID:	320-35090-9		
Client ID:	WGNA-011518-DUP19				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	14	Worklist Smp#:	19
Injection 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

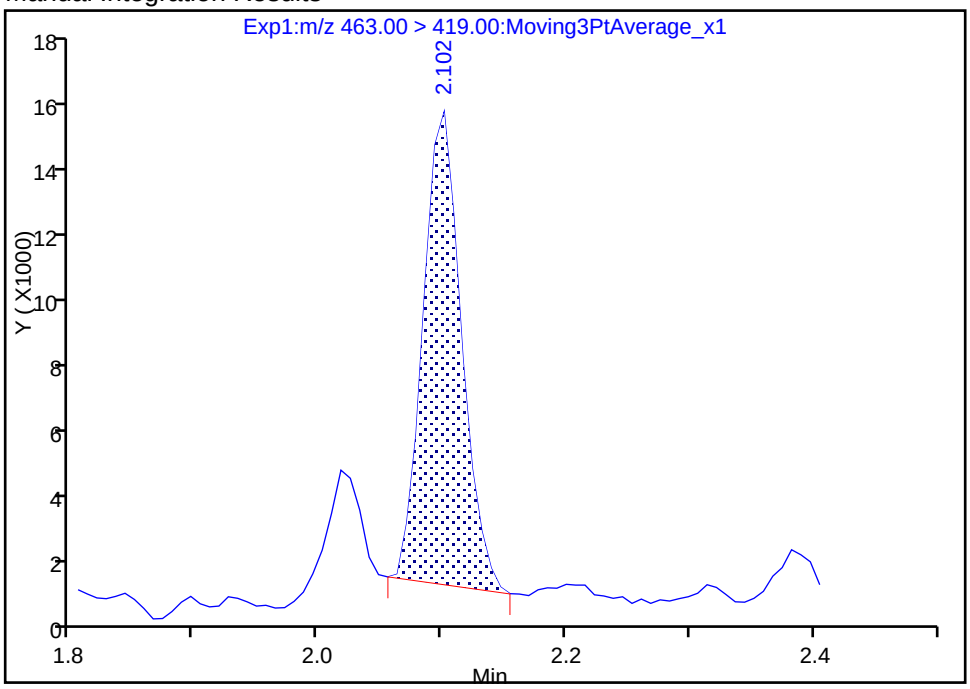
Not Detected
Expected RT: 2.10

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 29037
Amount: 0.306696
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:39:44
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-213 | Lab Sample ID: 320-35090-10

Matrix: Water | Lab File ID: 2018.02.02_537A_023.d

Analysis Method: 537 | Date Collected: 01/15/2018 10:10

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 248.9(mL) | Date Analyzed: 02/02/2018 15:38

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	40	M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	24		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.6	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.0	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	102		70-130
STL00996	13C2 PFDA	110		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_023.d
Lims ID: 320-35090-A-10-A
Client ID: NAWC-011518-RW-213
Sample Type: Client
Inject. Date: 02-Feb-2018 15:38:59 ALS Bottle#: 15 Worklist Smp#: 20
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-10-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:49:36 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:42:08

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.381	-0.008	1.000	222018	1.80		238	
298.90 > 99.00	1.373	1.381	-0.008	1.000	157031		1.41(0.00-0.00)	226	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.502	-0.007	1.000	1574690	10.2		7771	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.639	1.646	-0.007	1.000	349166	1.89		234	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.639	1.646	-0.007	1.000	229224	1.75		45.3	
* 6 13C2-PFOA									
415.00 > 370.00	1.828	1.844	-0.016		1399237	10.0		5954	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.828	1.844	-0.016	1.000	786446	6.07		108	
413.00 > 169.00	1.828	1.844	-0.016	1.000	462522		1.70(0.00-0.00)	1024	
* 7 13C4 PFOS									
503.00 > 80.00	2.086	2.094	-0.008		3165894	28.7		4291	
9 Perfluorononanoic acid									
463.00 > 419.00	2.094	2.102	-0.008	1.000	69973	0.7530		11.2	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.086	2.124	-0.038	1.000	1024702	9.89		393	M
499.00 > 99.00	2.079	2.124	-0.045	0.996	188077		5.45(0.00-0.00)	260	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1180922	11.0		8725	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 06-Feb-2018 13:49:52 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_023.d

Injection Date: 02-Feb-2018 15:38:59 Instrument ID: A8_N

Lims ID: 320-35090-A-10-A Lab Sample ID: 320-35090-10

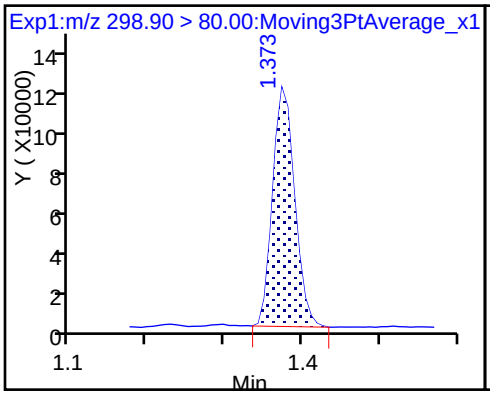
Client ID: NAWC-011518-RW-213

Operator ID: SACINSTLCMS01 ALS Bottle#: 15 Worklist Smp#: 20

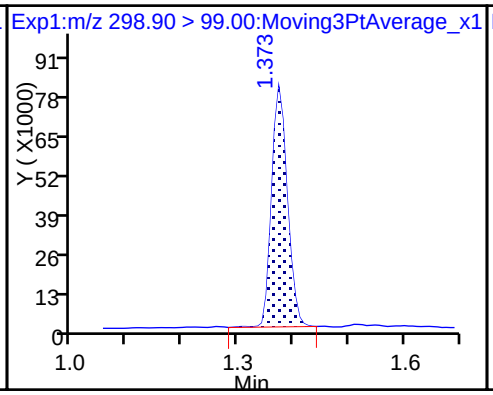
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

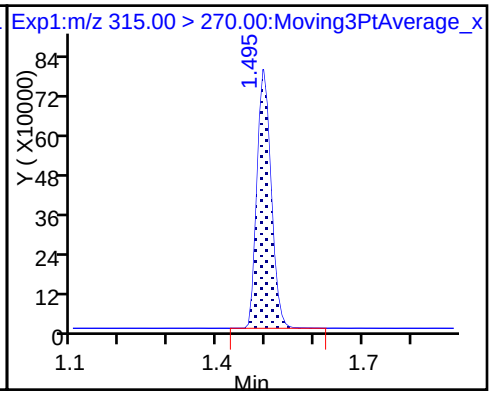
1 Perfluorobutanesulfonic acid



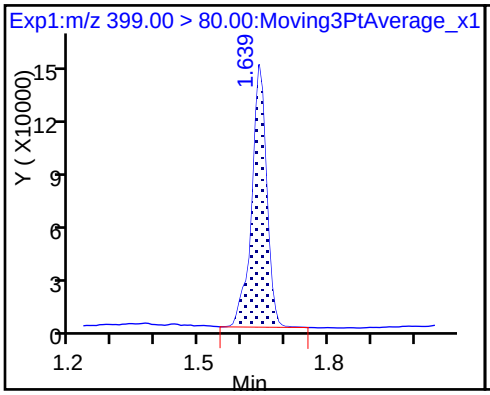
1 Perfluorobutanesulfonic acid



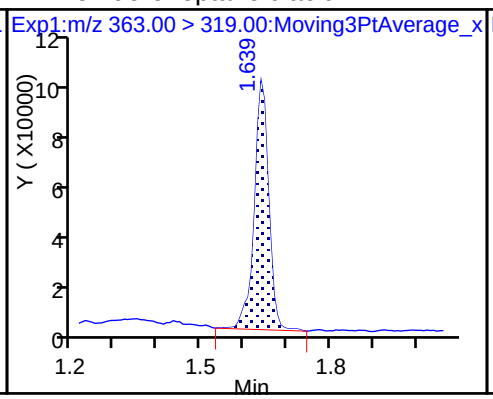
$ 2 13C2 PFHxA



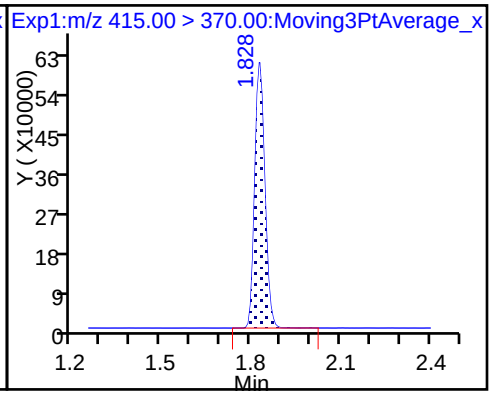
3 Perfluorohexanesulfonic acid



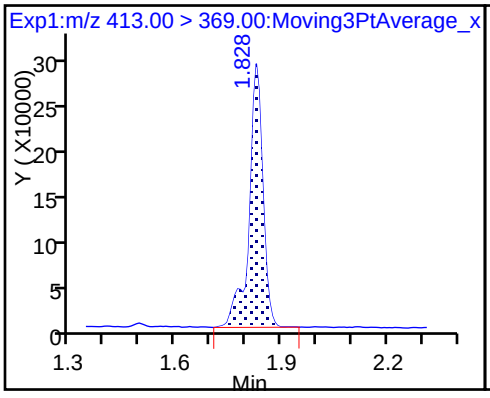
4 Perfluoroheptanoic acid



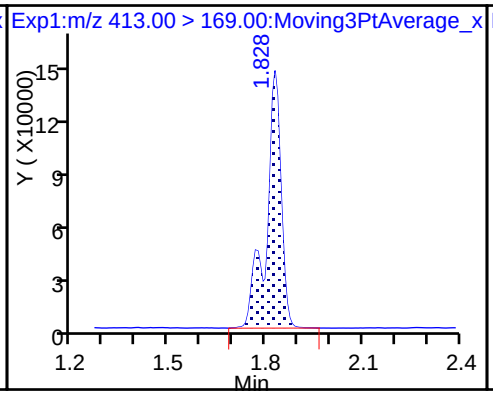
* 6 13C2-PFOA



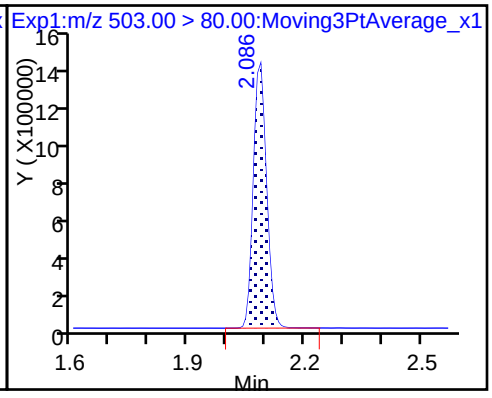
5 Perfluorooctanoic acid



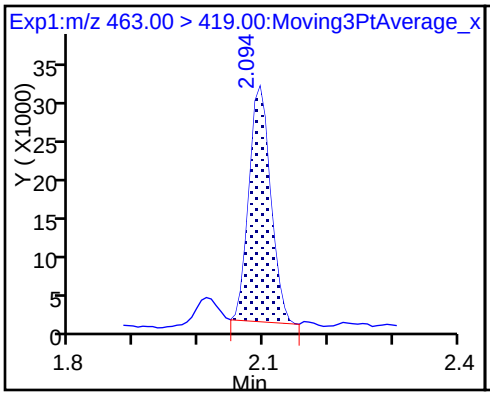
5 Perfluorooctanoic acid



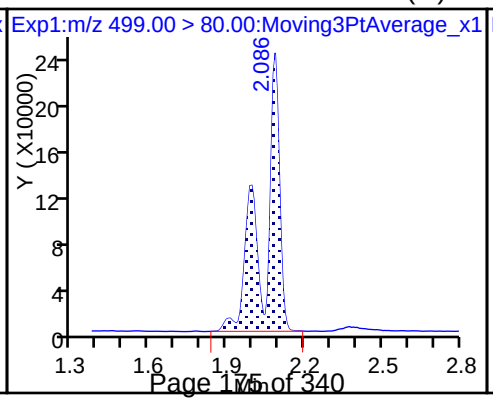
* 7 13C4 PFOS



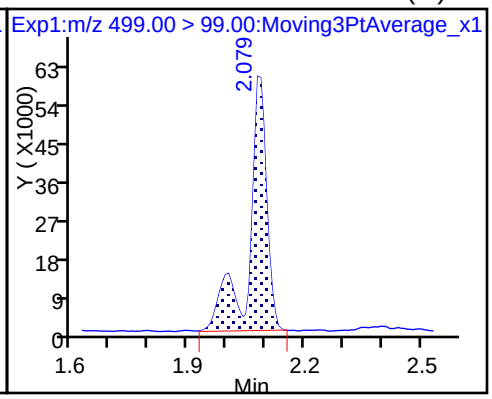
9 Perfluorononanoic acid



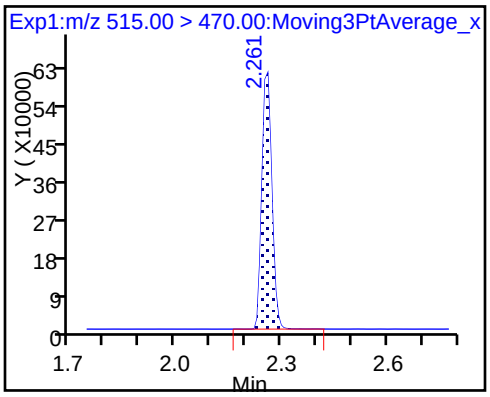
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.261
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\20180202-53640.b\2018.02.02_537A_023.d				
Lims ID:	320-35090-A-10-A				
Client ID:	NAWC-011518-RW-213				
Sample Type:	Client				
Inject. Date:	02-Feb-2018 15:38:59	ALS Bottle#:	15	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-35090-a-10-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	06-Feb-2018 13:49:36	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:	XAWRK055				
First Level Reviewer: hannigana		Date:	06-Feb-2018 13:42:08		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.2	102.28
$ 10 13C2 PFDA	10.0	11.0	110.29

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

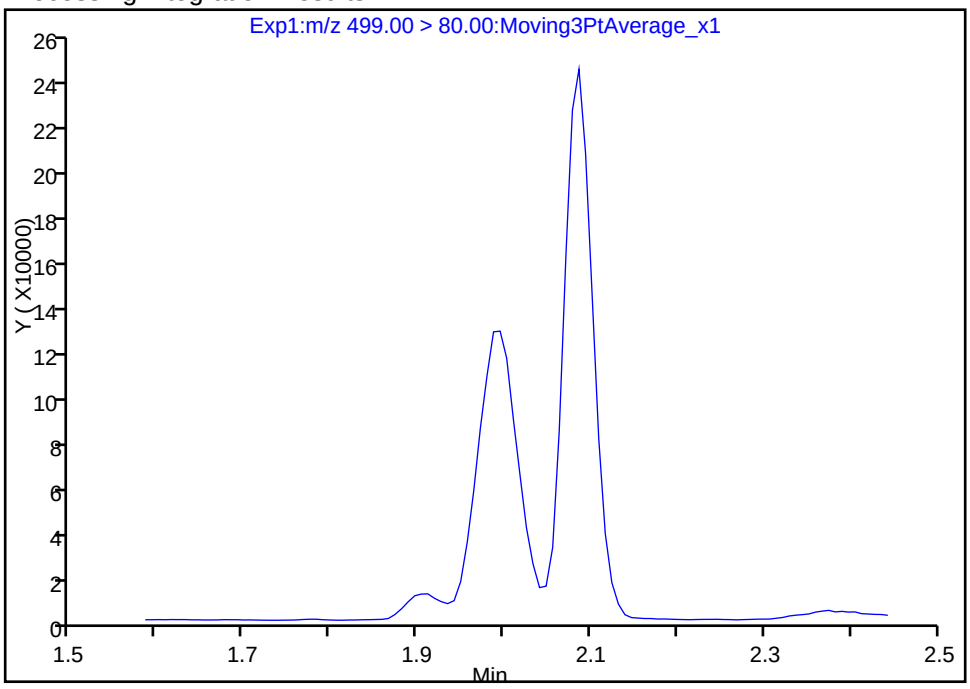
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_023.d				
Injection Date:	02-Feb-2018 15:38:59	Instrument ID:	A8_N		
Lims ID:	320-35090-A-10-A	Lab Sample ID:	320-35090-10		
Client ID:	NAWC-011518-RW-213				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	15	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

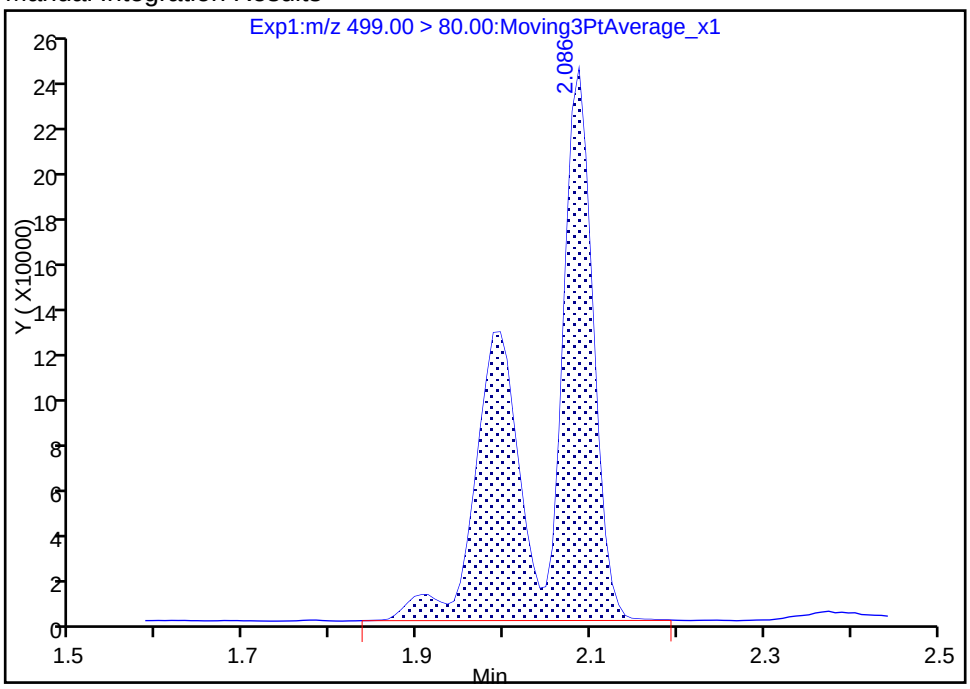
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.09
Area: 1024702
Amount: 9.886407
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:41:45
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

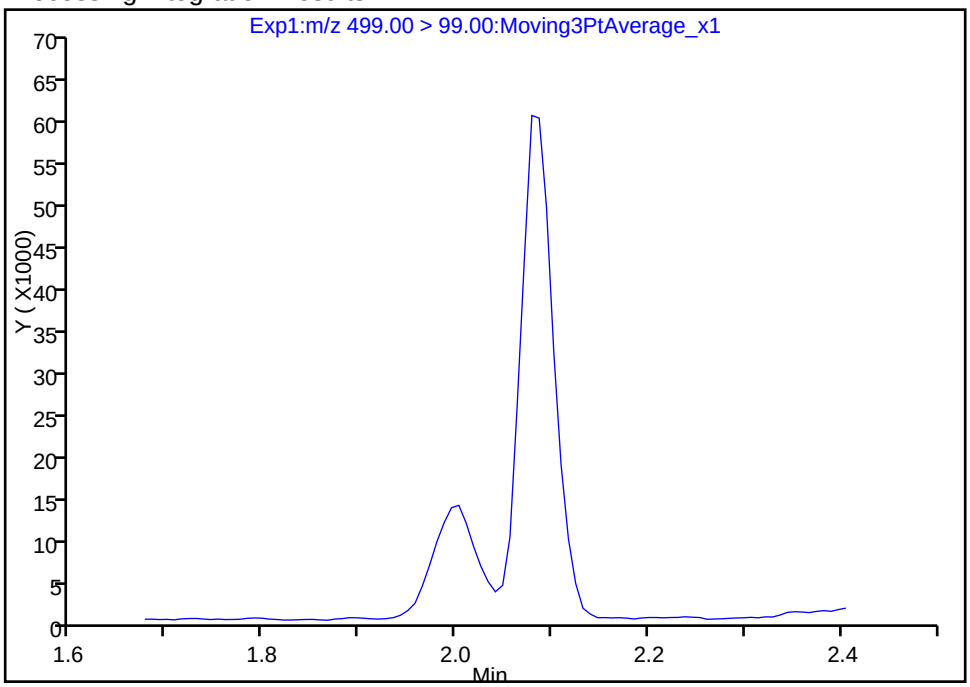
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_023.d				
Injection Date:	02-Feb-2018 15:38:59	Instrument ID:	A8_N		
Lims ID:	320-35090-A-10-A	Lab Sample ID:	320-35090-10		
Client ID:	NAWC-011518-RW-213				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	15	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 2

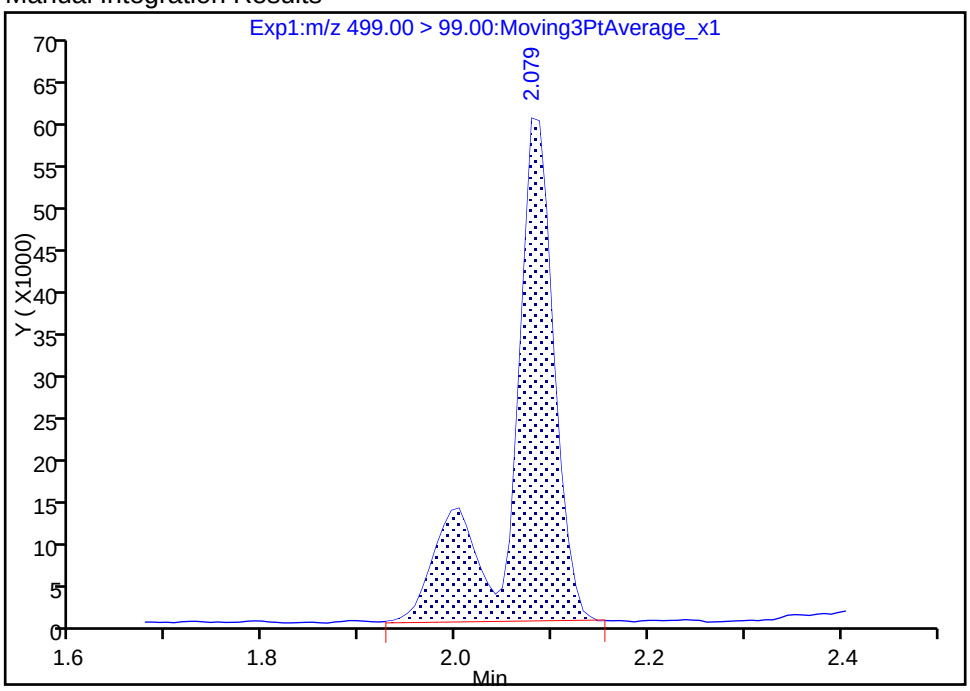
Processing Integration Results

Not Detected
Expected RT: 2.12



Manual Integration Results

RT: 2.08
Area: 188077
Amount: 9.886407
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:41:48
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-213 | Lab Sample ID: 320-35090-11

Matrix: Water | Lab File ID: 2018.02.02_537A_024.d

Analysis Method: 537 | Date Collected: 01/15/2018 10:05

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 250.6(mL) | Date Analyzed: 02/02/2018 15:43

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

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

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

Analysis Batch No.: 206762 | 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	100		70-130
STL00996	13C2 PFDA	110		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_024.d
Lims ID: 320-35090-A-11-A
Client ID: NAWC-011518-FRB-213
Sample Type: Client
Inject. Date: 02-Feb-2018 15:43:40 ALS Bottle#: 16 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-11-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:49:36 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:48:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.502	-0.007	1.000	1631945	10.0		8278	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.844	-0.008		1477701	10.0		6945	
* 7 13C4 PFOS									
503.00 > 80.00	2.086	2.094	-0.008		3257549	28.7		7837	
$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1245921	11.0		8704	

Report Date: 06-Feb-2018 13:49:52 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_024.d

Injection Date: 02-Feb-2018 15:43:40 Instrument ID: A8_N

Lims ID: 320-35090-A-11-A Lab Sample ID: 320-35090-11

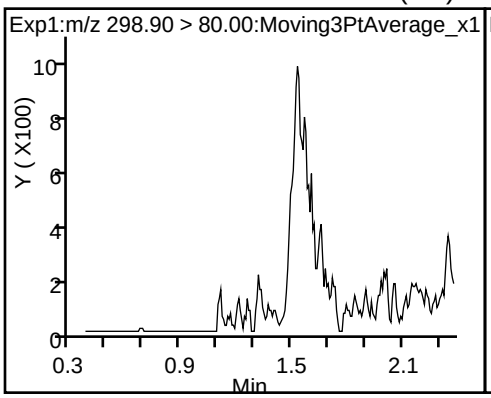
Client ID: NAWC-011518-FRB-213

Operator ID: SACINSTLCMS01 ALS Bottle#: 16 Worklist Smp#: 21

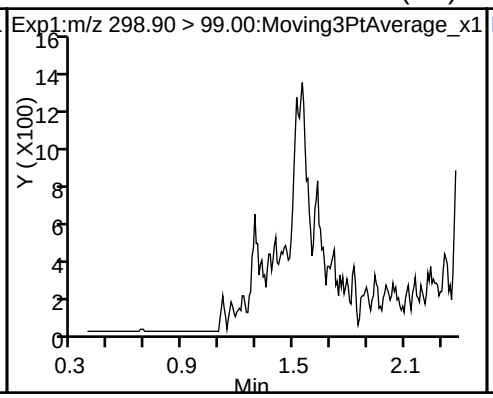
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

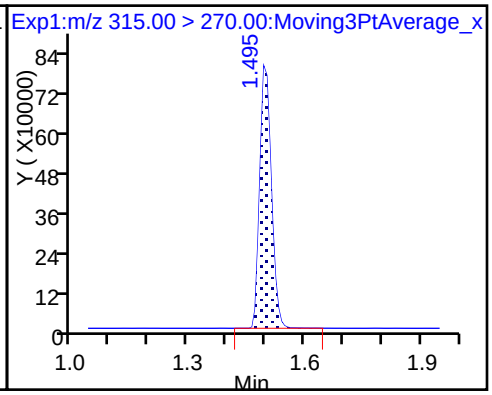
1 Perfluorobutanesulfonic acid (ND)



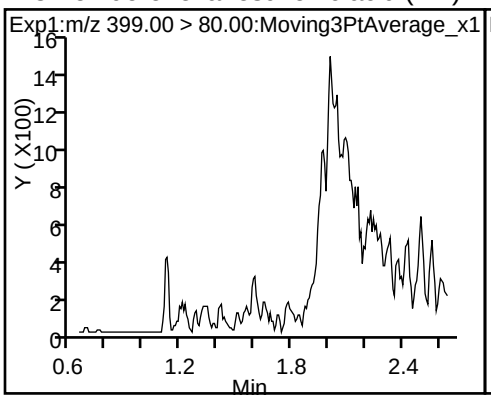
1 Perfluorobutanesulfonic acid (ND)



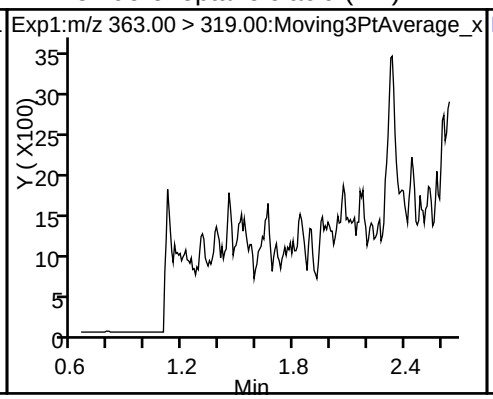
$ 2 13C2 PFHxA



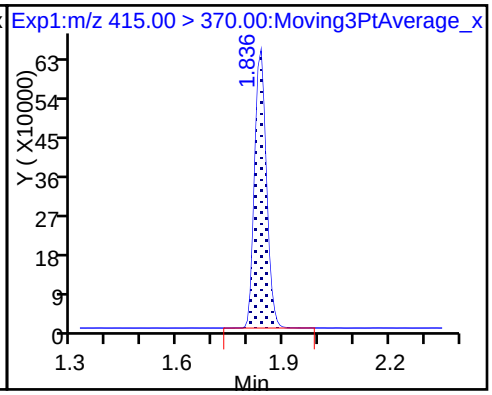
3 Perfluorohexanesulfonic acid (ND)



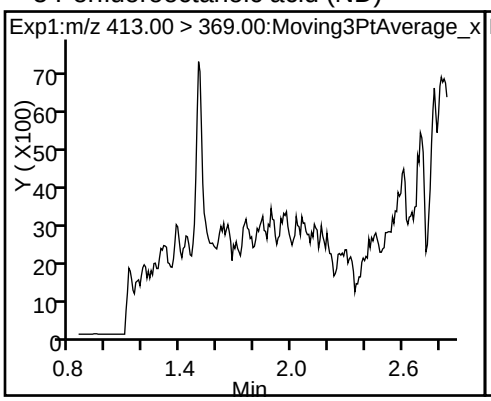
4 Perfluoroheptanoic acid (ND)



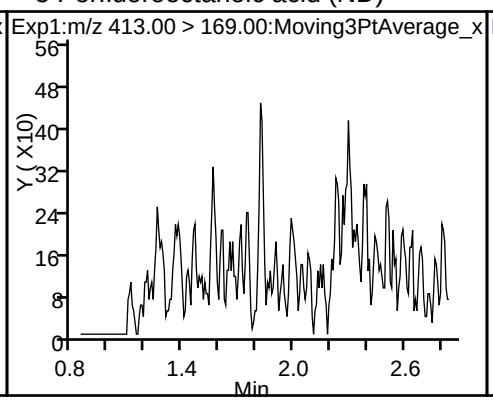
* 6 13C2-PFOA



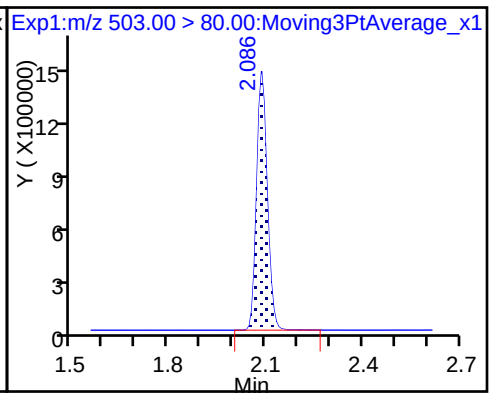
5 Perfluorooctanoic acid (ND)



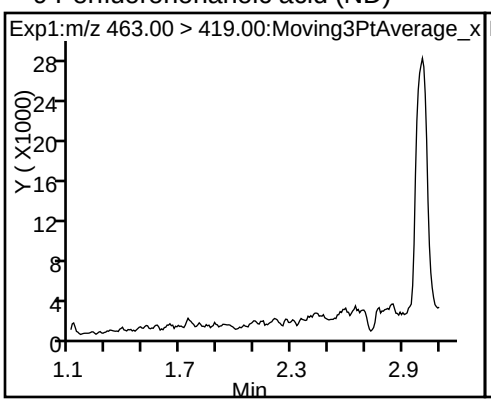
5 Perfluorooctanoic acid (ND)



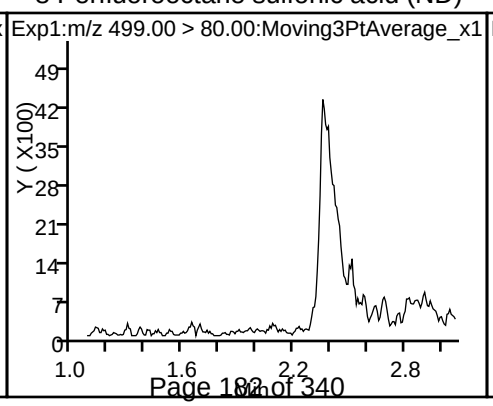
* 7 13C4 PFOS



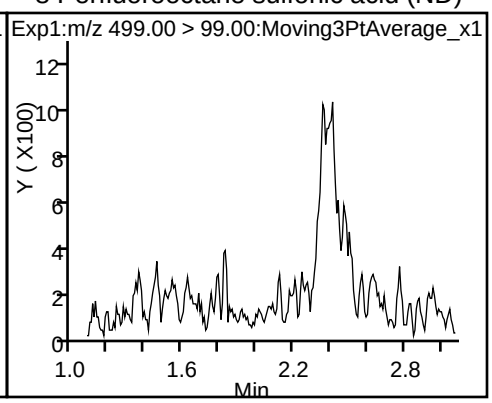
9 Perfluorononanoic acid (ND)



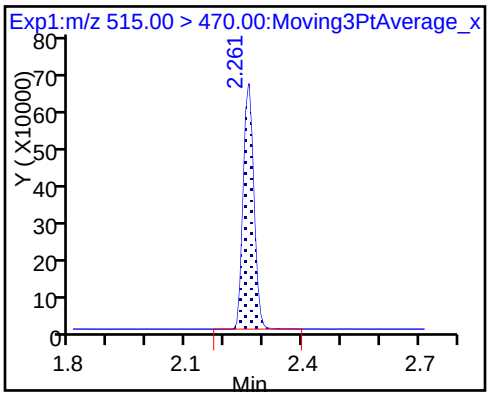
8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.261
Y (X10000)
80
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\20180202-53640.b\2018.02.02_537A_024.d				
Lims ID:	320-35090-A-11-A				
Client ID:	NAWC-011518-FRB-213				
Sample Type:	Client				
Inject. Date:	02-Feb-2018 15:43:40	ALS Bottle#:	16	Worklist Smp#:	21
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-35090-a-11-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	06-Feb-2018 13:49:36	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:	XAWRK055				
First Level Reviewer: hannigana		Date:	06-Feb-2018 13:48:25		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.0	100.37
$ 10 13C2 PFDA	10.0	11.0	110.19

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-215 | Lab Sample ID: 320-35090-12

Matrix: Water | Lab File ID: 2018.02.02_537A_025.d

Analysis Method: 537 | Date Collected: 01/15/2018 12:10

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 247.6(mL) | Date Analyzed: 02/02/2018 15:48

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	J M	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	10	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)	6.7	J	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.2	J	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	101		70-130
STL00996	13C2 PFDA	109		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_025.d
Lims ID: 320-35090-A-12-A
Client ID: NAWC-011518-RW-215
Sample Type: Client
Inject. Date: 02-Feb-2018 15:48:20 ALS Bottle#: 17 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-12-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:49:36 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:43:27

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	112700	0.9384		148	
298.90 > 99.00	1.381	1.381	0.0	1.000	88186		1.28(0.00-0.00)	135	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1607615	10.1		9200	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.646	1.646	0.0	1.000	299672	1.67		270	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.646	1.646	0.0	1.000	107858	0.7962		23.4	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.844	-0.008		1445838	10.0		6960	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.836	1.844	-0.008	1.000	347638	2.60		49.3	
413.00 > 169.00	1.836	1.844	-0.008	1.000	208848		1.66(0.00-0.00)	487	
* 7 13C4 PFOS									
503.00 > 80.00	2.086	2.094	-0.008		3081289	28.7		4936	
9 Perfluorononanoic acid									M
463.00 > 419.00	2.102	2.102	0.0	1.000	27383	0.2852		5.1	M
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.094	2.124	-0.030	1.000	341387	3.38		138	M
499.00 > 99.00	2.086	2.124	-0.038	0.996	64797		5.27(0.00-0.00)	89.5	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1208258	10.9		9913	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 06-Feb-2018 13:49:53 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_025.d

Injection Date: 02-Feb-2018 15:48:20 Instrument ID: A8_N

Lims ID: 320-35090-A-12-A Lab Sample ID: 320-35090-12

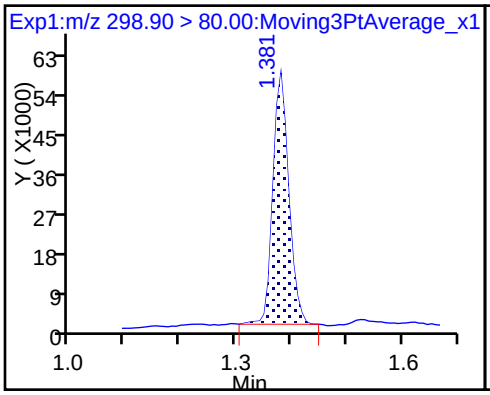
Client ID: NAWC-011518-RW-215

Operator ID: SACINSTLCMS01 ALS Bottle#: 17 Worklist Smp#: 22

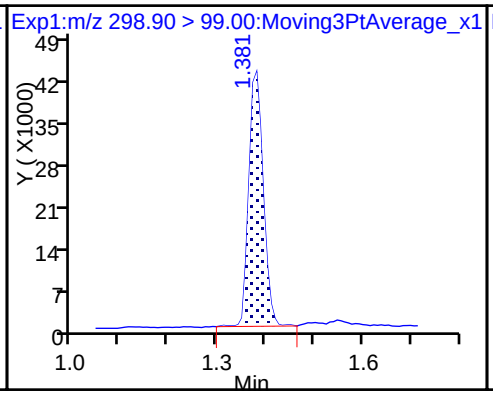
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

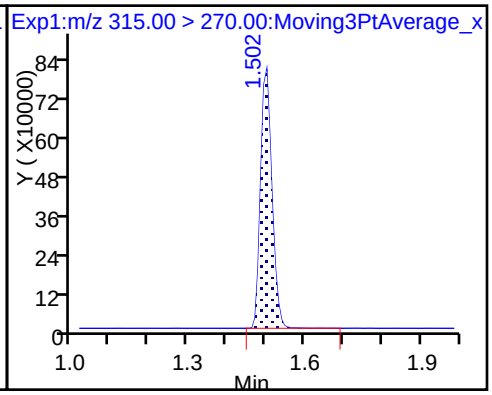
1 Perfluorobutanesulfonic acid



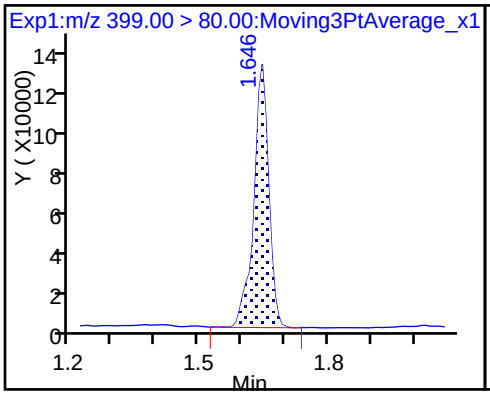
1 Perfluorobutanesulfonic acid



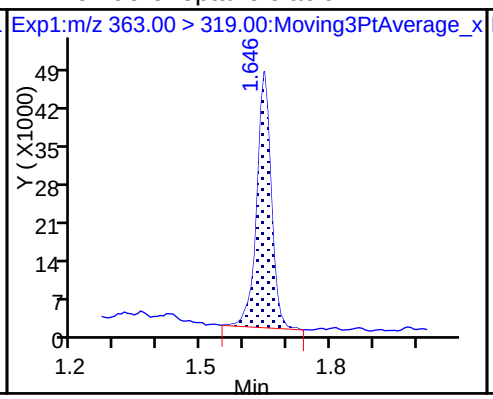
$ 2 13C2 PFHxA



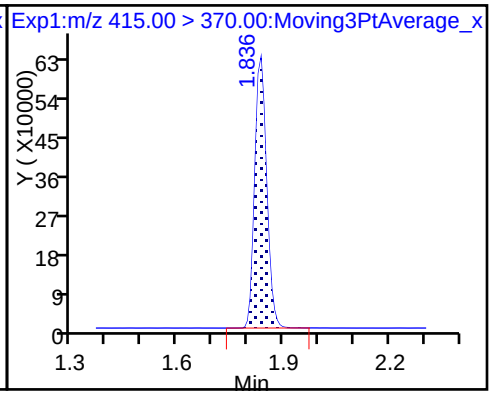
3 Perfluorohexanesulfonic acid



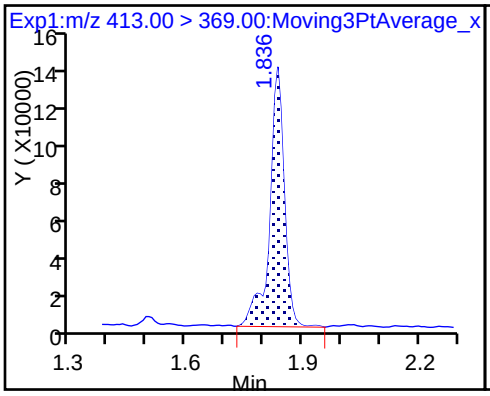
4 Perfluoroheptanoic acid



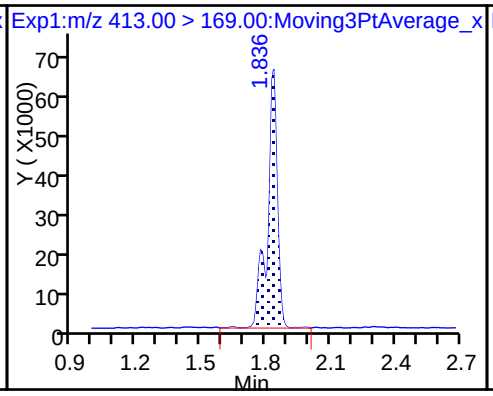
* 6 13C2-PFOA



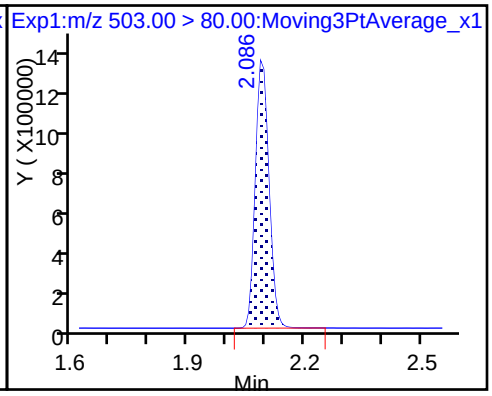
5 Perfluorooctanoic acid



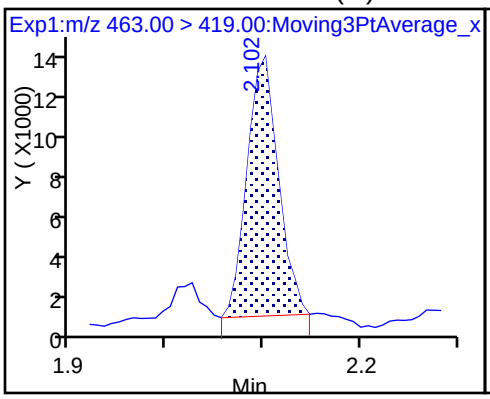
5 Perfluorooctanoic acid



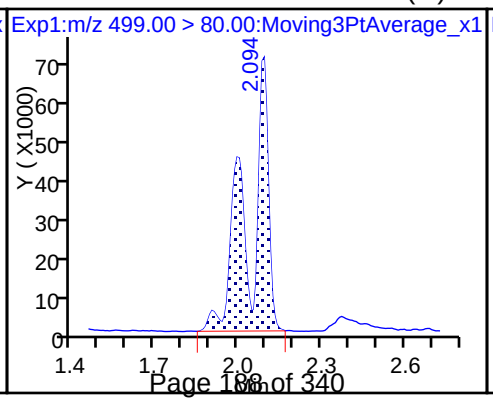
* 7 13C4 PFOS



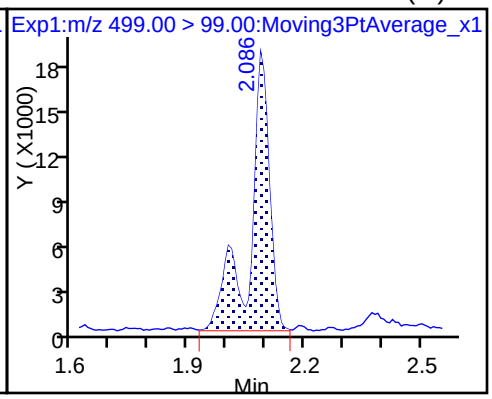
9 Perfluorononanoic acid (M)



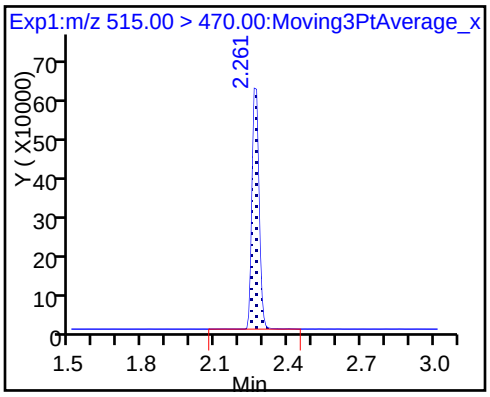
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.261
Y (X10000)
70
60
50
40
30
20
10
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\20180202-53640.b\2018.02.02_537A_025.d				
Lims ID:	320-35090-A-12-A				
Client ID:	NAWC-011518-RW-215				
Sample Type:	Client				
Inject. Date:	02-Feb-2018 15:48:20	ALS Bottle#:	17	Worklist Smp#:	22
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-35090-a-12-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	06-Feb-2018 13:49:36	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:	XAWRK055				
First Level Reviewer: hannigana		Date:	06-Feb-2018 13:43:27		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.1	101.05
$ 10 13C2 PFDA	10.0	10.9	109.21

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

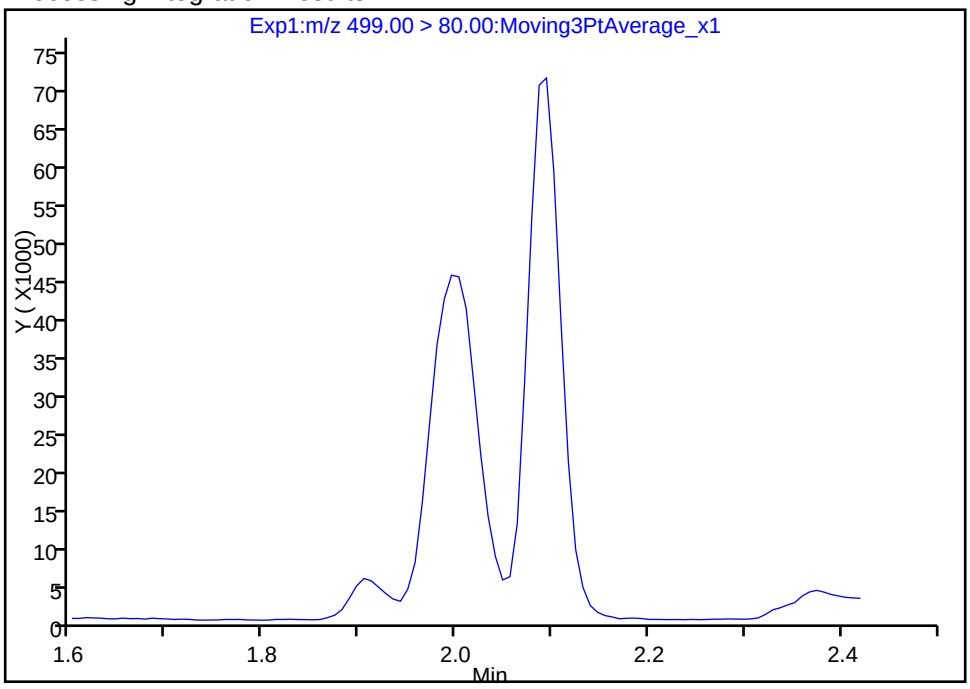
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_025.d				
Injection Date:	02-Feb-2018 15:48:20	Instrument ID:	A8_N		
Lims ID:	320-35090-A-12-A	Lab Sample ID:	320-35090-12		
Client ID:	NAWC-011518-RW-215				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	17	Worklist Smp#:	22
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

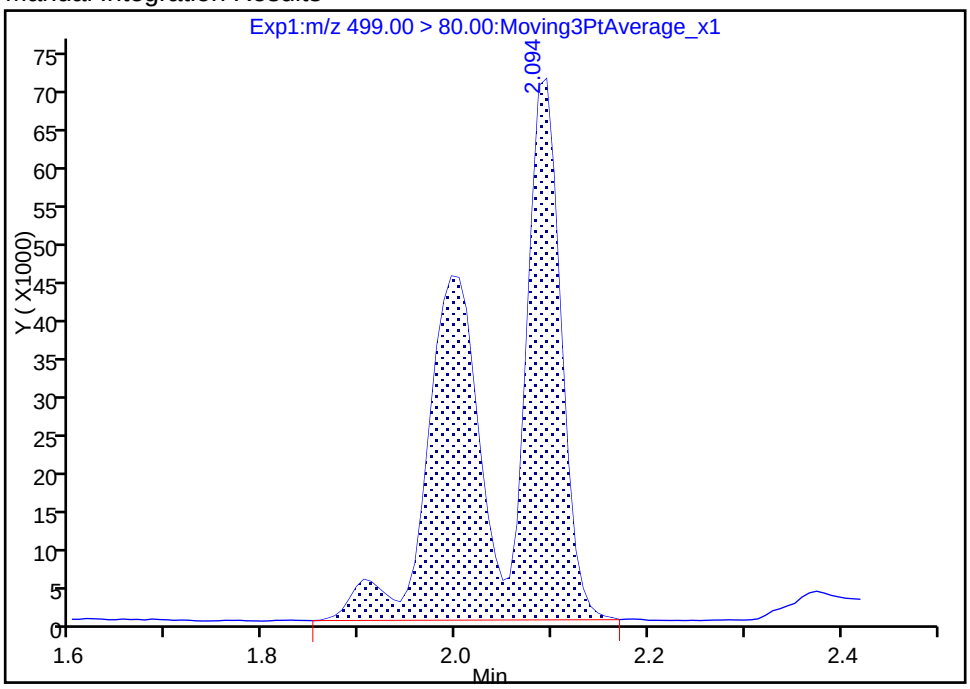
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.09
Area: 341387
Amount: 3.384167
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:42:46
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

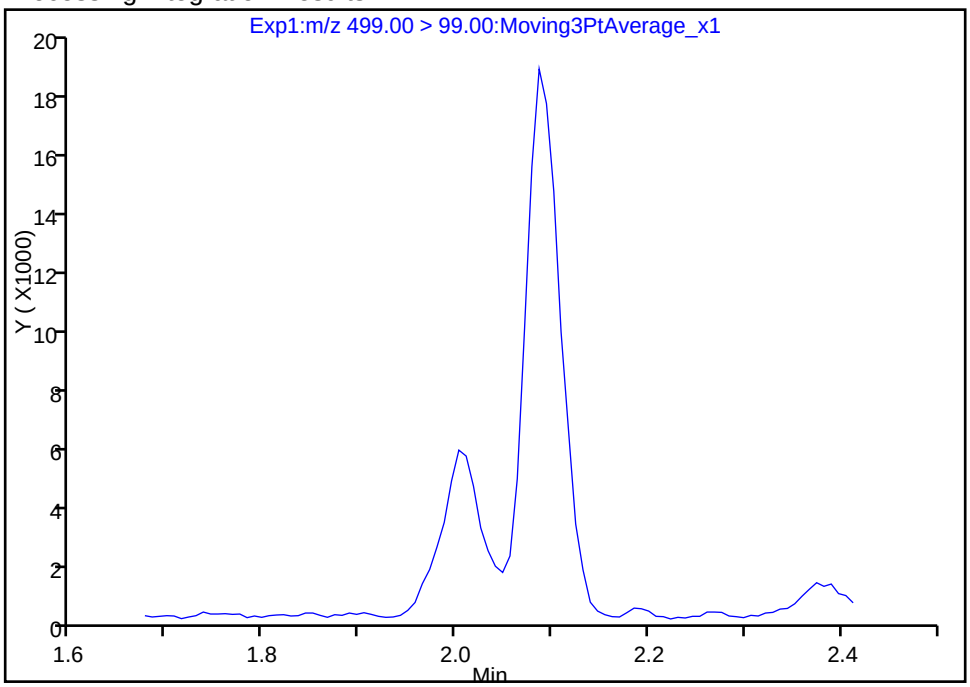
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_025.d				
Injection Date:	02-Feb-2018 15:48:20	Instrument ID:	A8_N		
Lims ID:	320-35090-A-12-A	Lab Sample ID:	320-35090-12		
Client ID:	NAWC-011518-RW-215				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	17	Worklist Smp#:	22
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 2

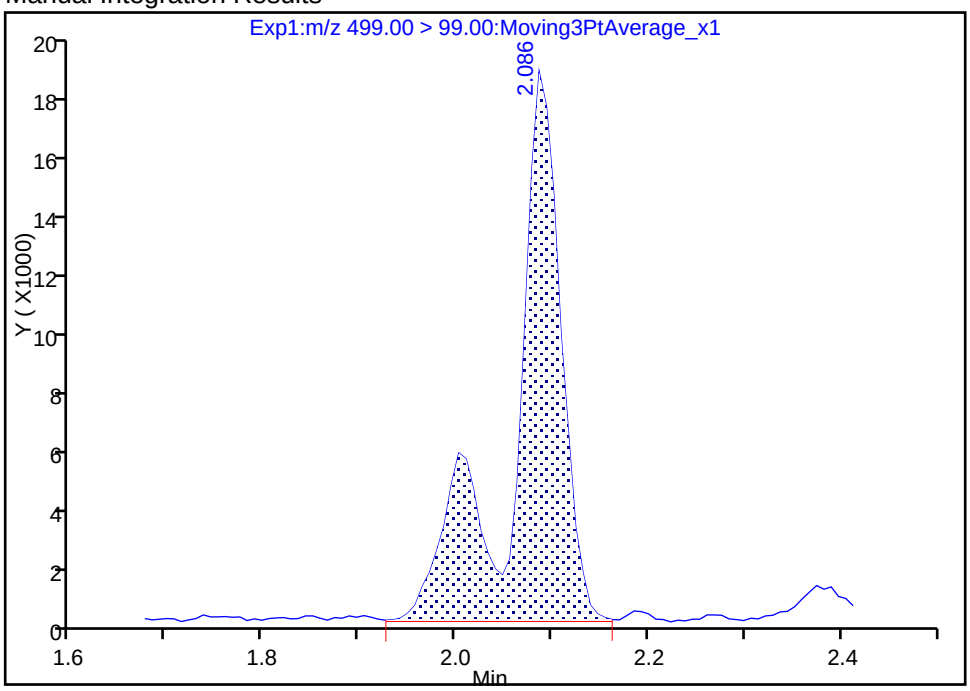
Processing Integration Results

Not Detected
Expected RT: 2.12



Manual Integration Results

RT: 2.09
Area: 64797
Amount: 3.384167
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:42:53
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

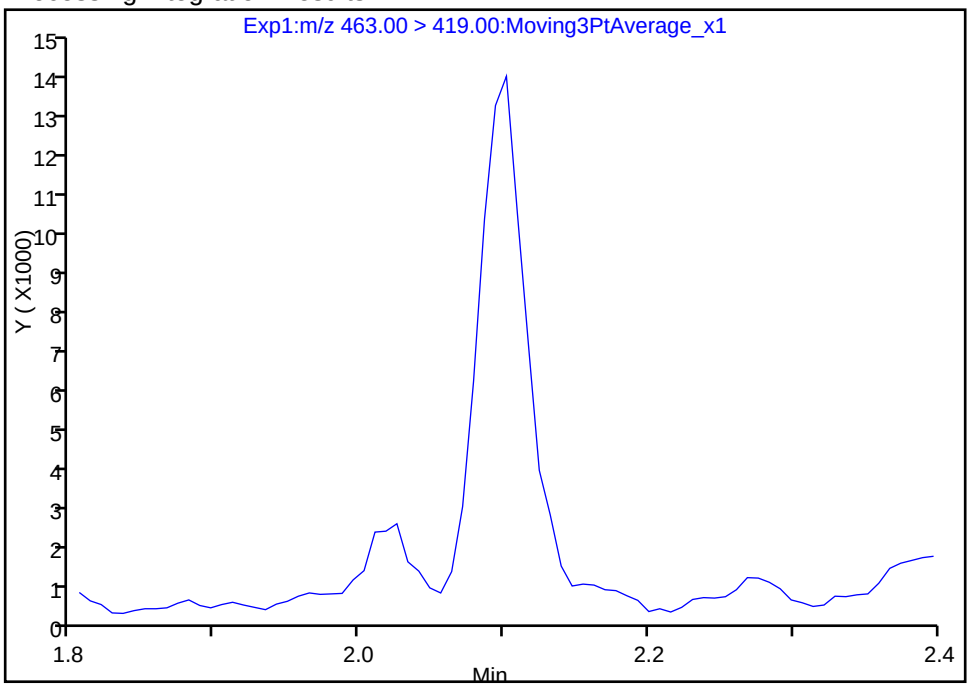
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_025.d				
Injection Date:	02-Feb-2018 15:48:20	Instrument ID:	A8_N		
Lims ID:	320-35090-A-12-A	Lab Sample ID:	320-35090-12		
Client ID:	NAWC-011518-RW-215				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	17	Worklist Smp#:	22
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

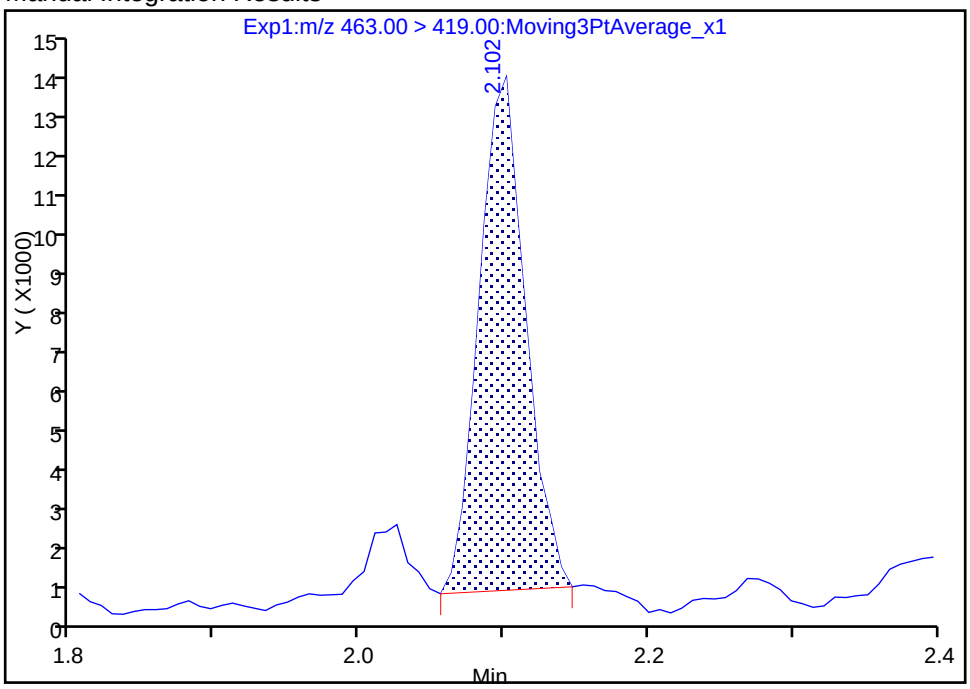
Not Detected
Expected RT: 2.10

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 27383
Amount: 0.285160
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:43:03
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-215 | Lab Sample ID: 320-35090-13

Matrix: Water | Lab File ID: 2018.02.02_537A_026.d

Analysis Method: 537 | Date Collected: 01/15/2018 12:05

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 251.5(mL) | Date Analyzed: 02/02/2018 15:53

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

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

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

Analysis Batch No.: 206762 | 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	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	100		70-130
STL00996	13C2 PFDA	118		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_026.d
Lims ID: 320-35090-A-13-A
Client ID: NAWC-011518-FRB-215
Sample Type: Client
Inject. Date: 02-Feb-2018 15:53:00 ALS Bottle#: 18 Worklist Smp#: 23
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-13-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:49:36 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:43:48

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.502	-0.007	1.000	1539802	10.0		8343	
* 6 13C2-PFOA									
415.00 > 370.00	1.828	1.844	-0.016		1398357	10.0		6127	
* 7 13C4 PFOS									
503.00 > 80.00	2.079	2.094	-0.015		3172443	28.7		7189	
$ 10 13C2 PFDA									
515.00 > 470.00	2.253	2.261	-0.008	1.000	1263273	11.8		10394	

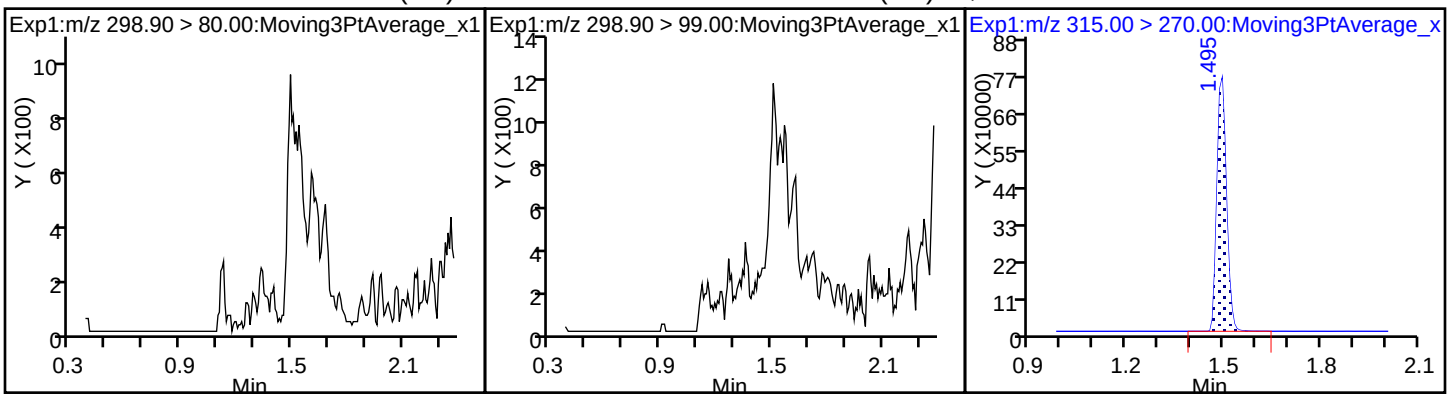
Report Date: 06-Feb-2018 13:49:54 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

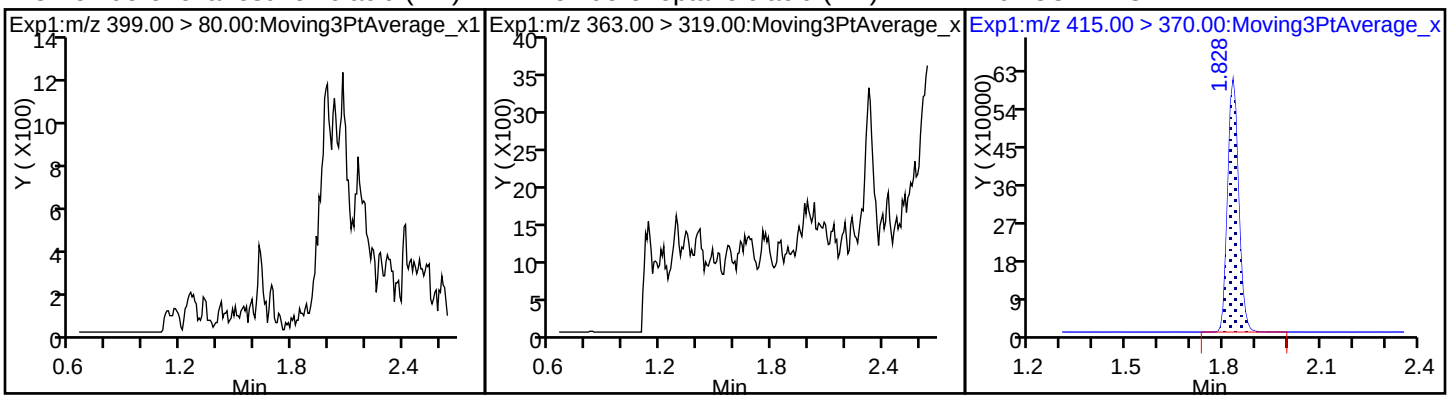
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_026.d

Injection Date:	02-Feb-2018 15:53:00	Instrument ID:	A8_N		
Lims ID:	320-35090-A-13-A	Lab Sample ID:	320-35090-13		
Client ID:	NAWC-011518-FRB-215				
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		

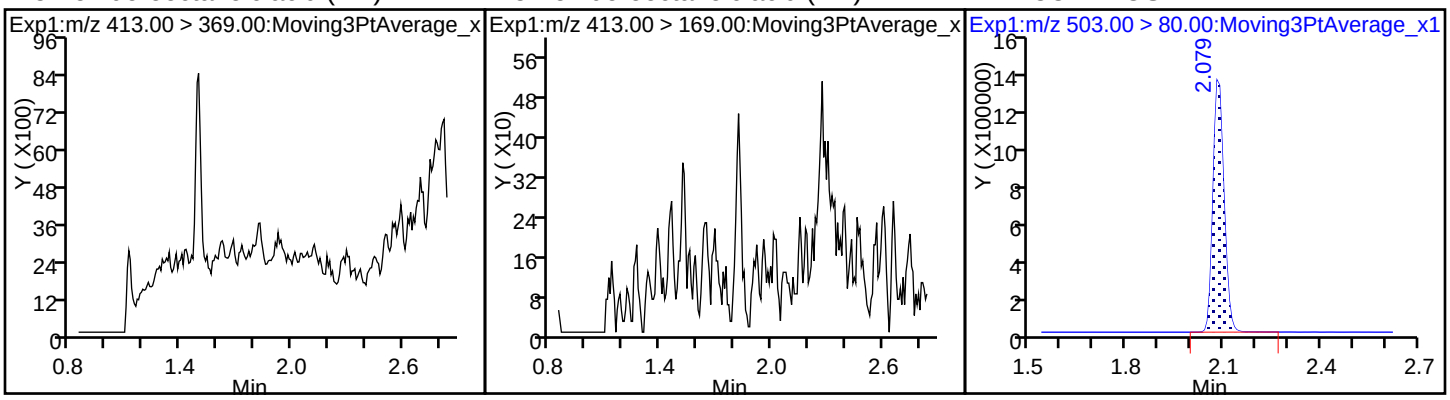
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) $ 2 13C2 PFHxA



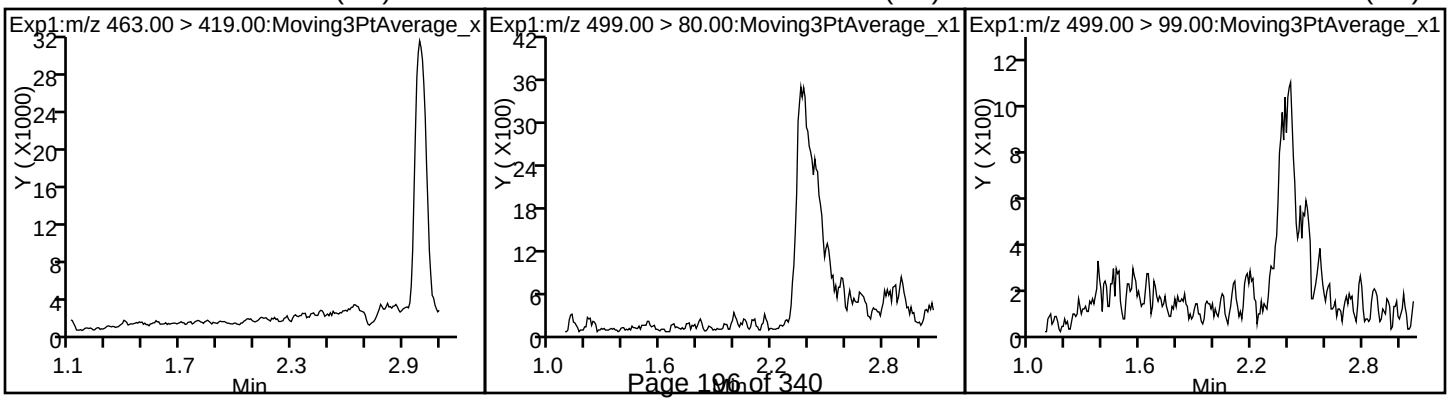
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



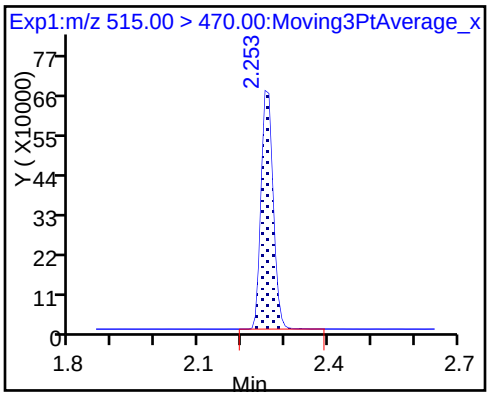
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) * 7 13C4 PFOS



9 Perfluorononanoic acid (ND) 8 Perfluorooctane sulfonic acid (ND) 8 Perfluorooctane sulfonic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.253
Y (X10000)
77
66
55
44
33
22
11
0
1.8
2.1
2.4
2.7
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_026.d				
Lims ID:	320-35090-A-13-A				
Client ID:	NAWC-011518-FRB-215				
Sample Type:	Client				
Inject. Date:	02-Feb-2018 15:53:00	ALS Bottle#:	18	Worklist Smp#:	23
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-35090-a-13-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	06-Feb-2018 13:49:36	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:	XAWRK055				
First Level Reviewer: hannigana		Date:	06-Feb-2018 13:43:48		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.0	100.08
$ 10 13C2 PFDA	10.0	11.8	118.06

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-48 | Lab Sample ID: 320-35090-14

Matrix: Water | Lab File ID: 2018.02.02_537A_027.d

Analysis Method: 537 | Date Collected: 01/15/2018 13:10

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 246(mL) | Date Analyzed: 02/02/2018 15:57

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U M	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	6.1	J	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)	1.9	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U M	91	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	107		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_027.d
Lims ID: 320-35090-A-14-A
Client ID: NAWC-011518-RW-48
Sample Type: Client
Inject. Date: 02-Feb-2018 15:57:41 ALS Bottle#: 19 Worklist Smp#: 24
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-14-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:49:36 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:44:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									M
298.90 > 80.00	1.373	1.381	-0.008	1.000	57937	0.4638		78.4	M
298.90 > 99.00	1.373	1.381	-0.008	1.000	43423		1.33(0.00-0.00)	67.1	M
$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.502	-0.007	1.000	1533023	9.59		7690	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.639	1.646	-0.007	1.000	113149	0.6052		89.2	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.639	1.646	-0.007	1.000	64171	0.4714		12.7	
* 6 13C2-PFOA									
415.00 > 370.00	1.828	1.844	-0.016		1453041	10.0		7055	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.828	1.844	-0.016	1.000	203276	1.51		27.7	
413.00 > 169.00	1.828	1.844	-0.016	1.000	133709		1.52(0.00-0.00)	310	
* 7 13C4 PFOS									
503.00 > 80.00	2.079	2.094	-0.015		3202843	28.7		4873	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	1.988	2.124	-0.136	1.000	145275	1.39		51.1	M
499.00 > 99.00	2.079	2.124	-0.045	1.046	19026		7.64(0.00-0.00)	19.1	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.253	2.261	-0.008	1.000	1186597	10.7		8069	

QC Flag Legend

Review Flags

M - Manually Integrated

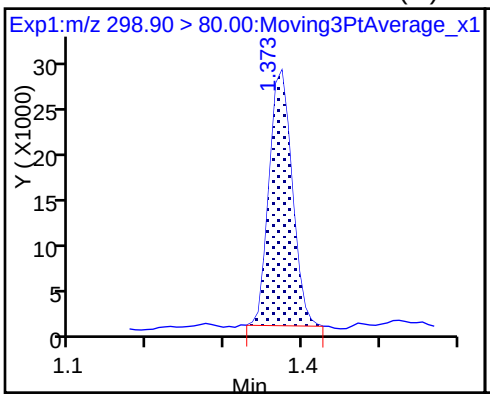
Report Date: 06-Feb-2018 13:49:55 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

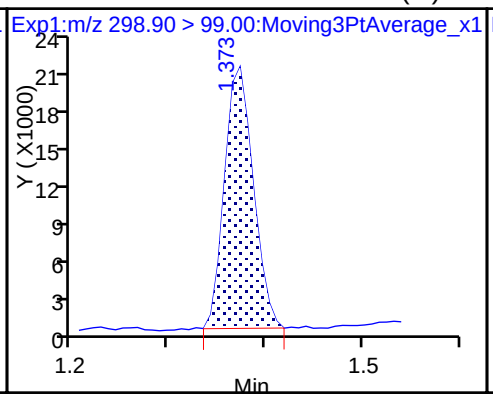
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_027.d

Injection Date:	02-Feb-2018 15:57:41	Instrument ID:	A8_N		
Lims ID:	320-35090-A-14-A	Lab Sample ID:	320-35090-14		
Client ID:	NAWC-011518-RW-48				
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		

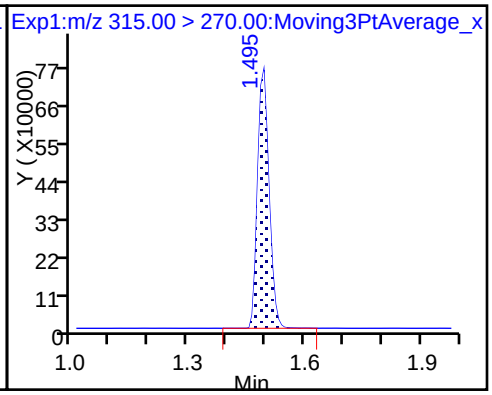
1 Perfluorobutanesulfonic acid (M)



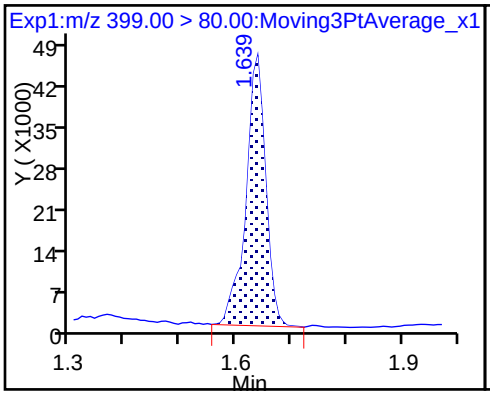
1 Perfluorobutanesulfonic acid (M)



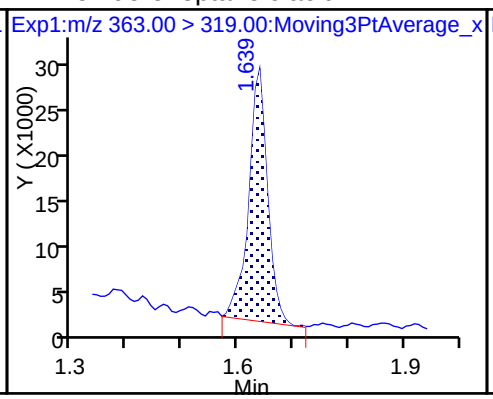
$ 2 13C2 PFHxA



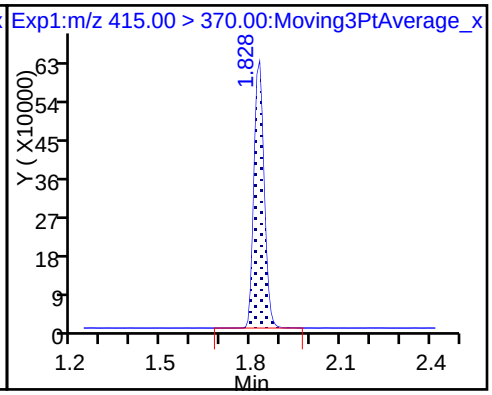
3 Perfluorohexanesulfonic acid



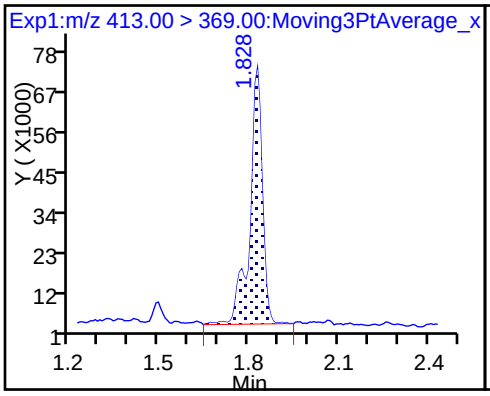
4 Perfluoroheptanoic acid



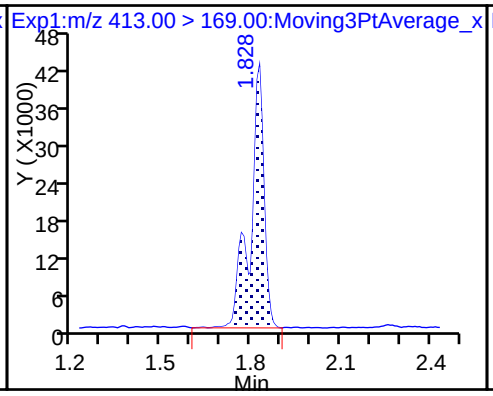
* 6 13C2-PFOA



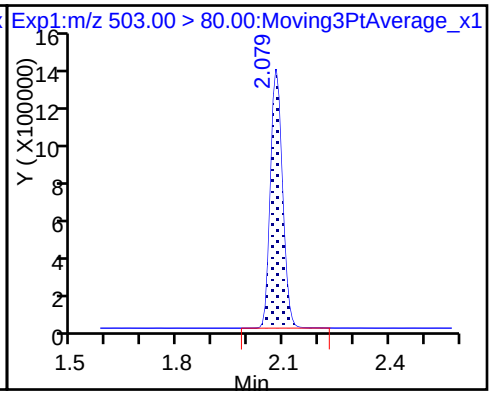
5 Perfluorooctanoic acid



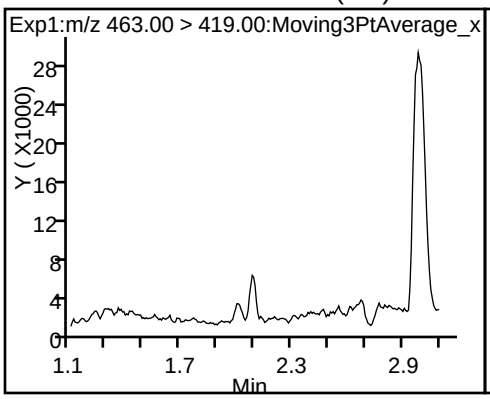
5 Perfluorooctanoic acid



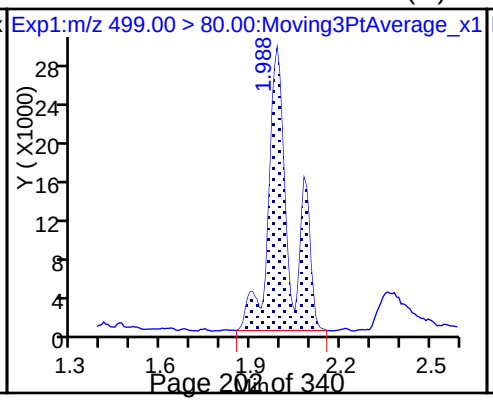
* 7 13C4 PFOS



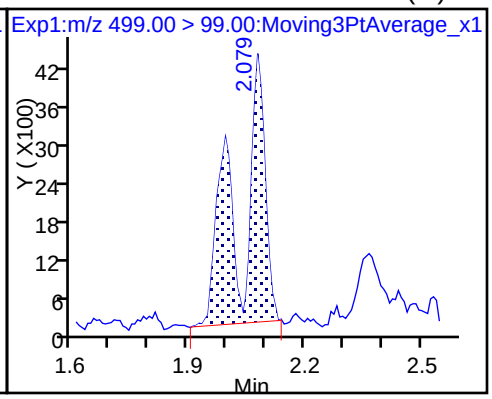
9 Perfluorononanoic acid (ND)



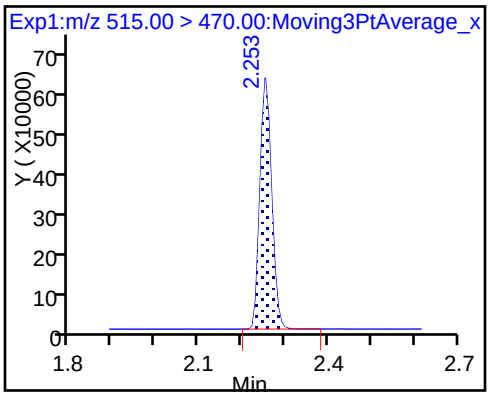
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.253
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\20180202-53640.b\2018.02.02_537A_027.d				
Lims ID:	320-35090-A-14-A				
Client ID:	NAWC-011518-RW-48				
Sample Type:	Client				
Inject. Date:	02-Feb-2018 15:57:41	ALS Bottle#:	19	Worklist Smp#:	24
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-35090-a-14-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	06-Feb-2018 13:49:36	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:	XAWRK055				
First Level Reviewer: hannigana		Date:	06-Feb-2018 13:44:51		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	9.59	95.89
$ 10 13C2 PFDA	10.0	10.7	106.72

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

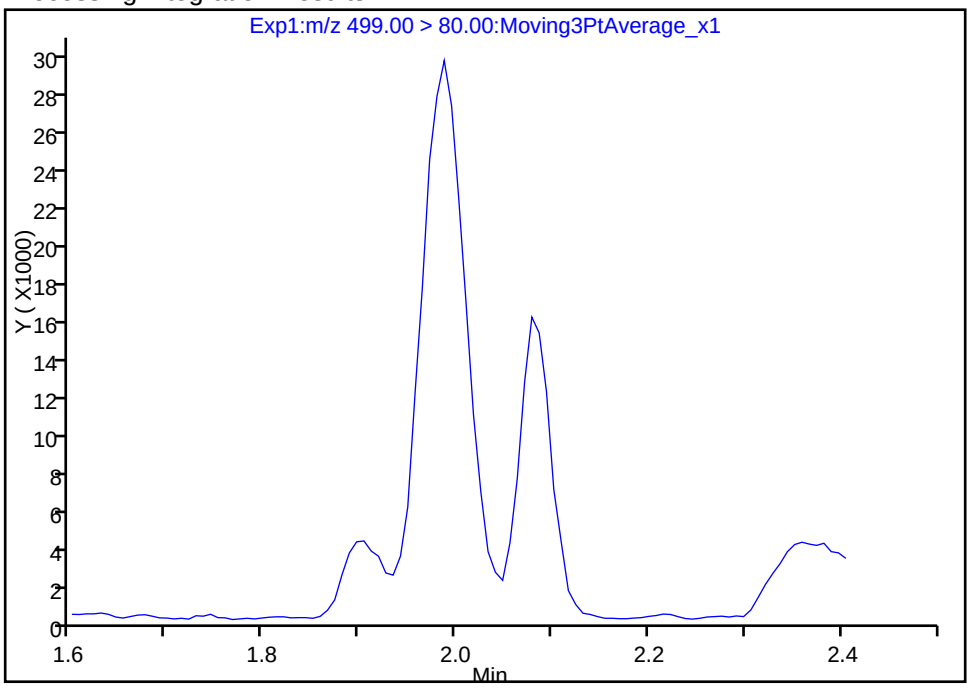
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_027.d				
Injection Date:	02-Feb-2018 15:57:41	Instrument ID:	A8_N		
Lims ID:	320-35090-A-14-A	Lab Sample ID:	320-35090-14		
Client ID:	NAWC-011518-RW-48				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	19	Worklist Smp#:	24
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

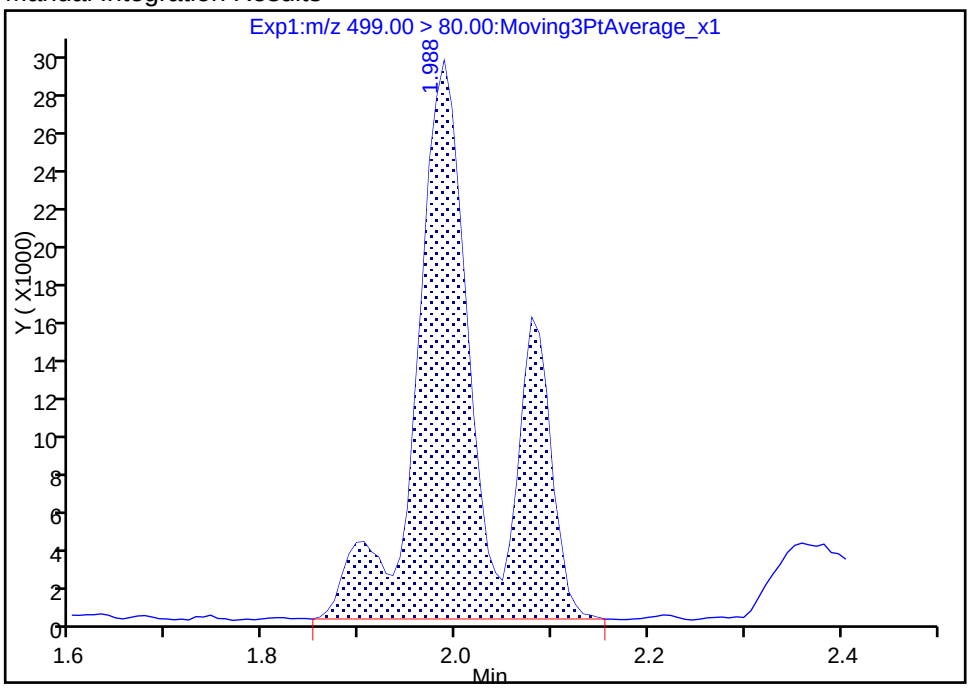
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 1.99
Area: 145275
Amount: 1.385455
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:44:05
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

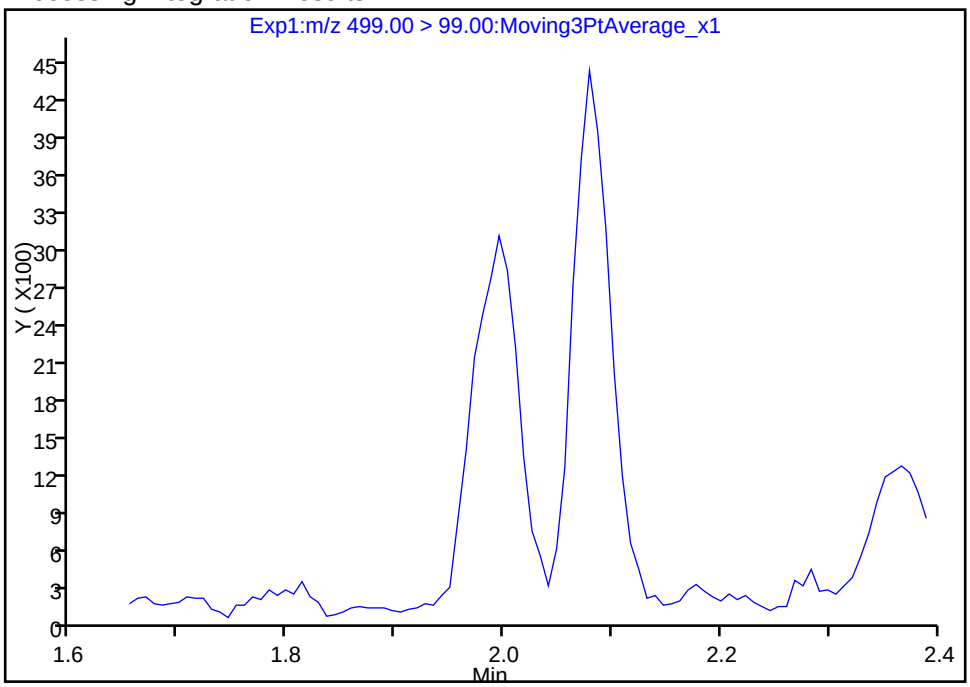
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_027.d				
Injection Date:	02-Feb-2018 15:57:41	Instrument ID:	A8_N		
Lims ID:	320-35090-A-14-A	Lab Sample ID:	320-35090-14		
Client ID:	NAWC-011518-RW-48				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	19	Worklist Smp#:	24
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 2

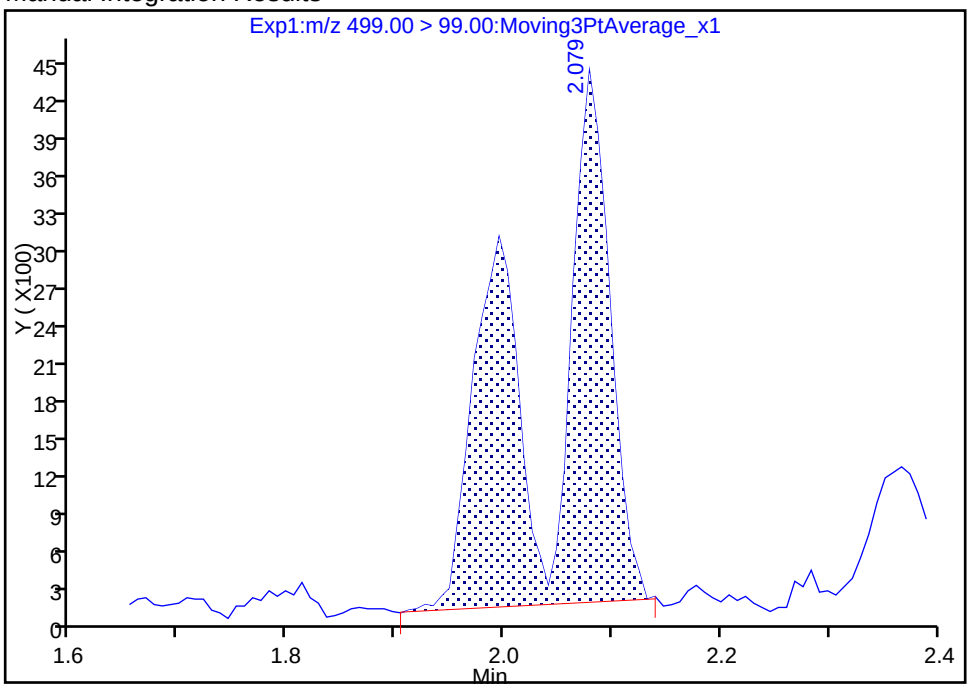
Processing Integration Results

Not Detected
Expected RT: 2.12



Manual Integration Results

RT: 2.08
Area: 19026
Amount: 1.385455
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:44:09
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

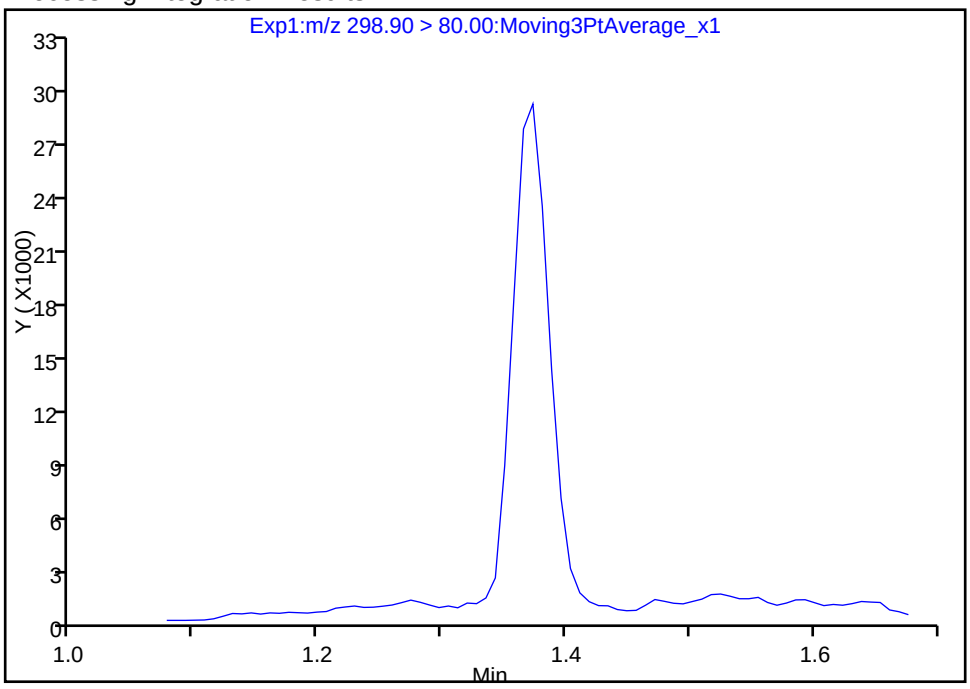
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_027.d				
Injection Date:	02-Feb-2018 15:57:41	Instrument ID:	A8_N		
Lims ID:	320-35090-A-14-A	Lab Sample ID:	320-35090-14		
Client ID:	NAWC-011518-RW-48				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	19	Worklist Smp#:	24
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

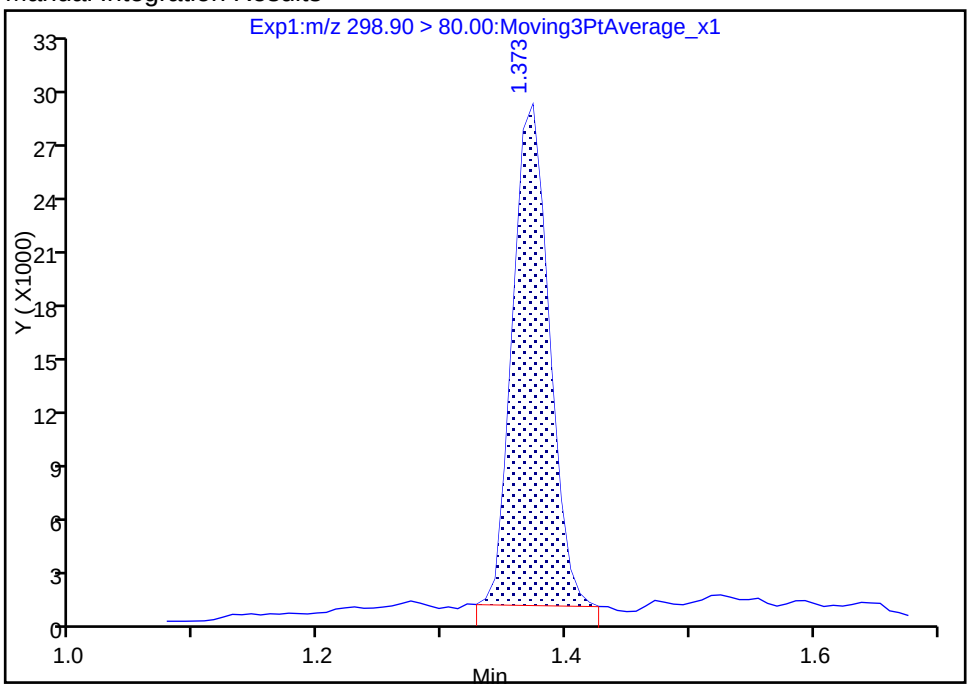
Not Detected
Expected RT: 1.38

Processing Integration Results



Manual Integration Results

RT: 1.37
Area: 57937
Amount: 0.463792
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:43:59
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

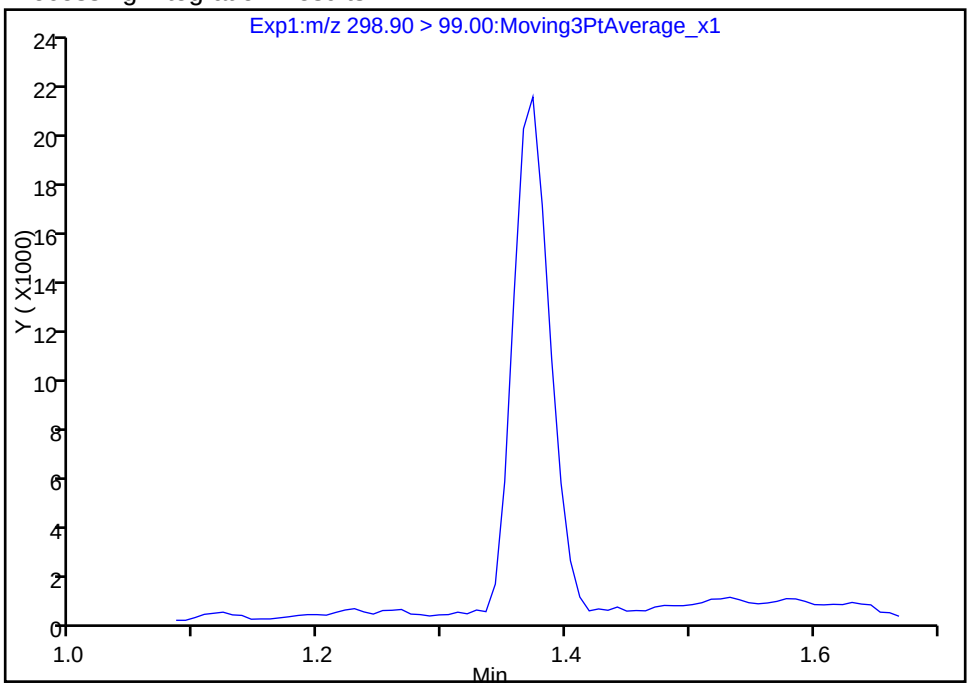
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_027.d				
Injection Date:	02-Feb-2018 15:57:41	Instrument ID:	A8_N		
Lims ID:	320-35090-A-14-A	Lab Sample ID:	320-35090-14		
Client ID:	NAWC-011518-RW-48				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	19	Worklist Smp#:	24
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

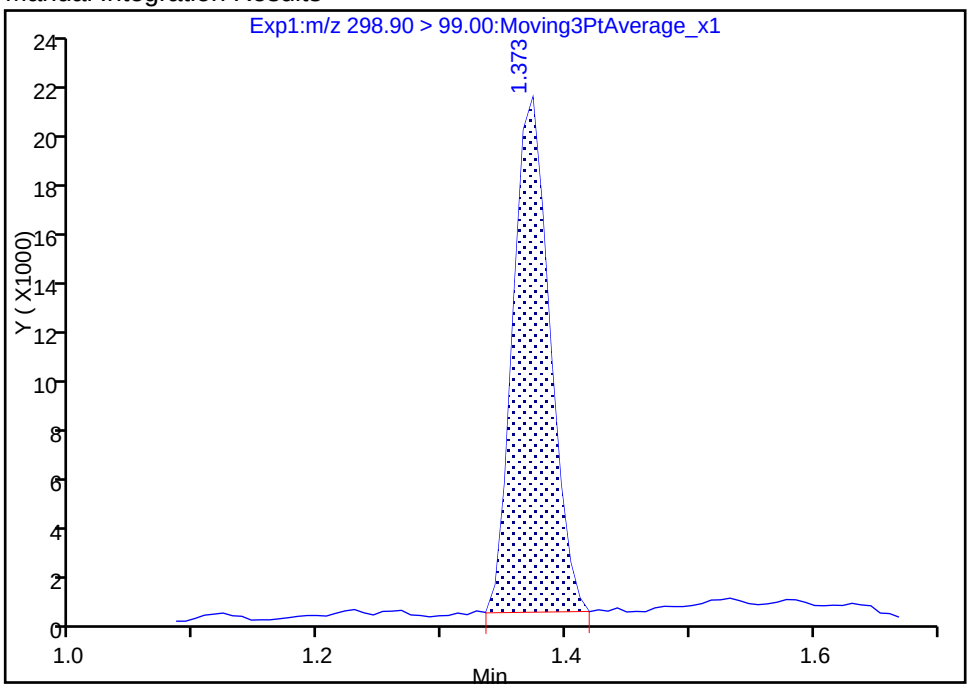
Processing Integration Results

Not Detected
Expected RT: 1.38



Manual Integration Results

RT: 1.37
Area: 43423
Amount: 0.463792
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:44:16
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-48 | Lab Sample ID: 320-35090-15

Matrix: Water | Lab File ID: 2018.02.02_537A_028.d

Analysis Method: 537 | Date Collected: 01/15/2018 13:05

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 250.4(mL) | Date Analyzed: 02/02/2018 16:02

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

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

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

Analysis Batch No.: 206762 | 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	107		70-130
STL00996	13C2 PFDA	111		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_028.d
Lims ID: 320-35090-A-15-A
Client ID: NAWC-011518-FRB-48
Sample Type: Client
Inject. Date: 02-Feb-2018 16:02:22 ALS Bottle#: 20 Worklist Smp#: 25
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35090-a-15-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:49:36 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:45:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.502	-0.007	1.000	1671706	10.7		9321	
* 6 13C2-PFOA									
415.00 > 370.00	1.828	1.844	-0.016		1416442	10.0		6936	
* 7 13C4 PFOS									
503.00 > 80.00	2.086	2.094	-0.008		3166785	28.7		7694	
$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1203431	11.1		8343	

Report Date: 06-Feb-2018 13:49:55 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_028.d

Injection Date: 02-Feb-2018 16:02:22 Instrument ID: A8_N

Lims ID: 320-35090-A-15-A Lab Sample ID: 320-35090-15

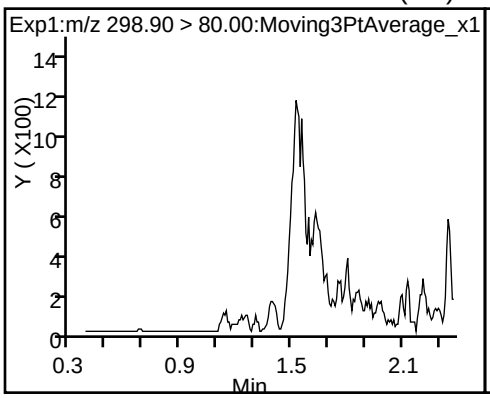
Client ID: NAWC-011518-FRB-48

Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 25

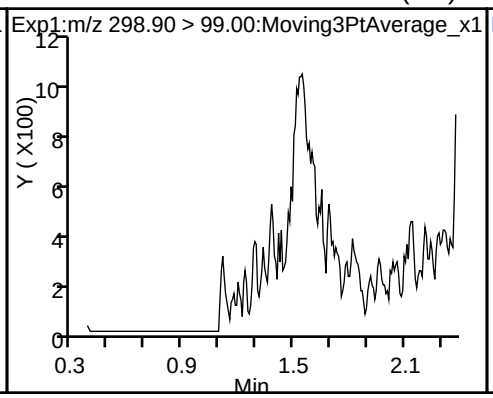
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

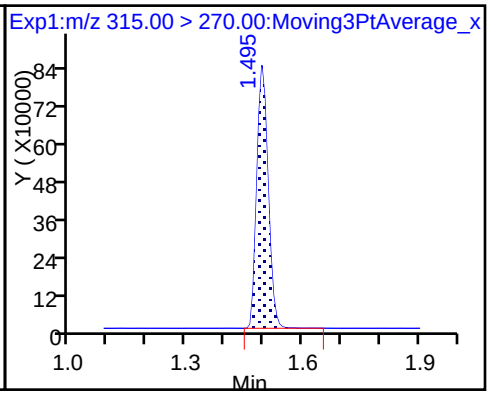
1 Perfluorobutanesulfonic acid (ND)



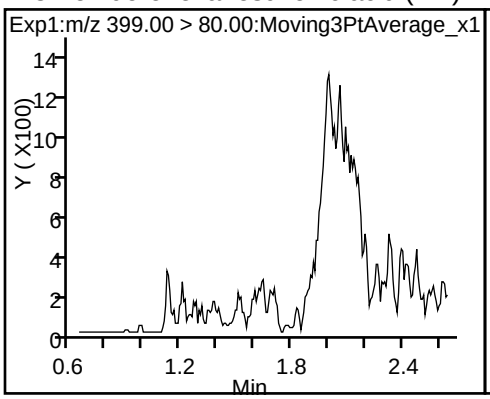
1 Perfluorobutanesulfonic acid (ND)



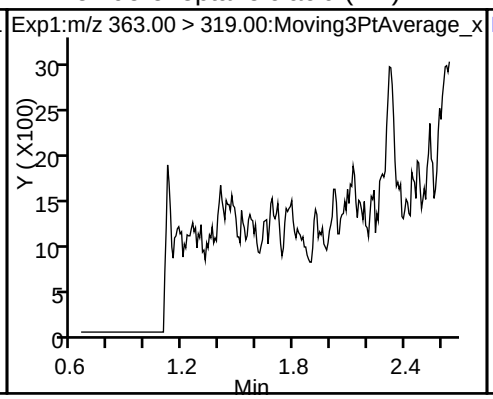
$ 2 13C2 PFHxA



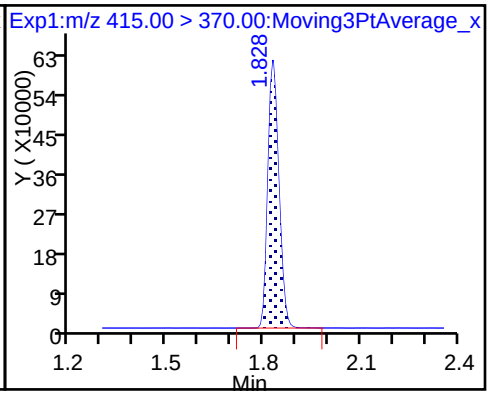
3 Perfluorohexanesulfonic acid (ND)



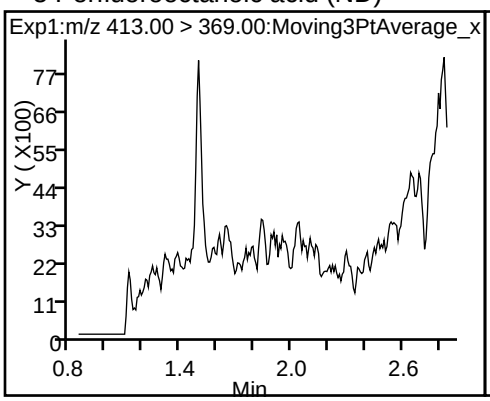
4 Perfluoroheptanoic acid (ND)



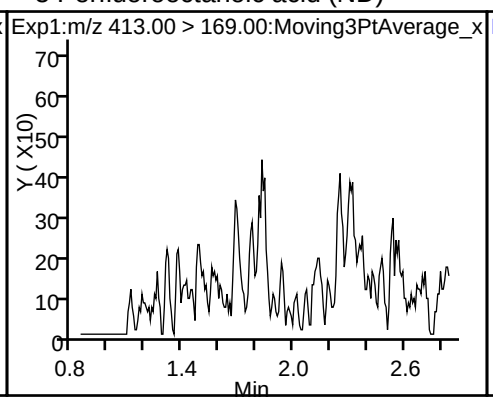
* 6 13C2-PFOA



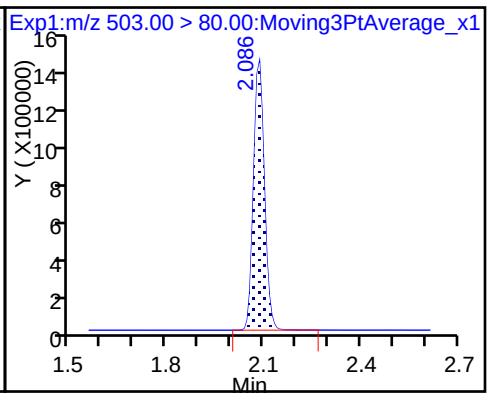
5 Perfluorooctanoic acid (ND)



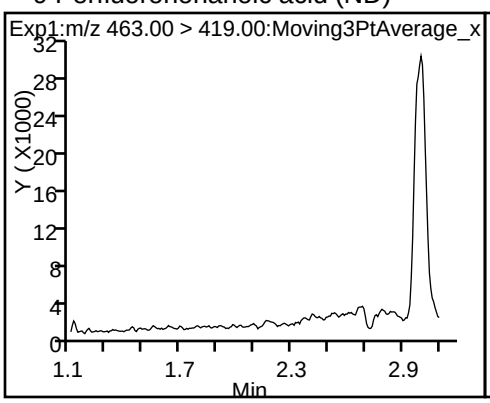
5 Perfluorooctanoic acid (ND)



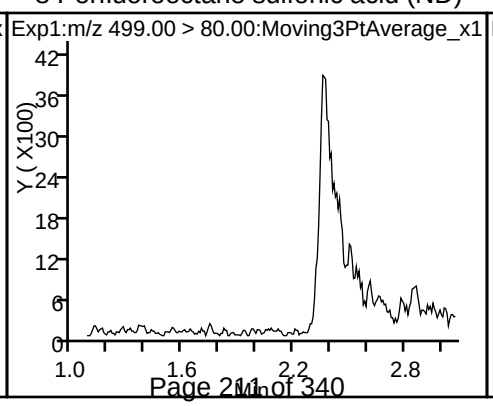
* 7 13C4 PFOS



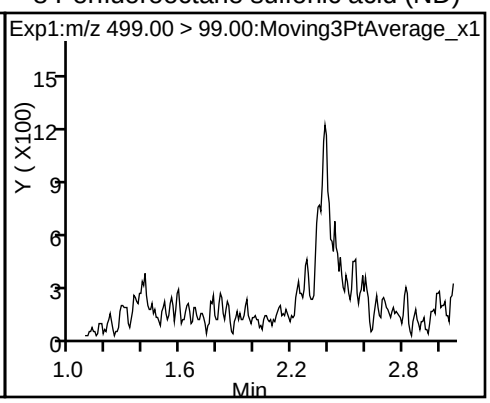
9 Perfluorononanoic acid (ND)



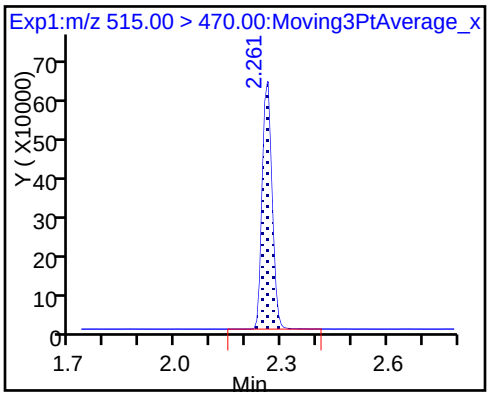
8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.261
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\20180202-53640.b\2018.02.02_537A_028.d				
Lims ID:	320-35090-A-15-A				
Client ID:	NAWC-011518-FRB-48				
Sample Type:	Client				
Inject. Date:	02-Feb-2018 16:02:22	ALS Bottle#:	20	Worklist Smp#:	25
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-35090-a-15-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	06-Feb-2018 13:49:36	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:	XAWRK055				
First Level Reviewer: hannigana		Date:	06-Feb-2018 13:45:09		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.7	107.26
$ 10 13C2 PFDA	10.0	11.1	111.03

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

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1 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.: 320-35090-1 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.: 320-35090-1 Analy Batch No.: 192908

SDG No.:

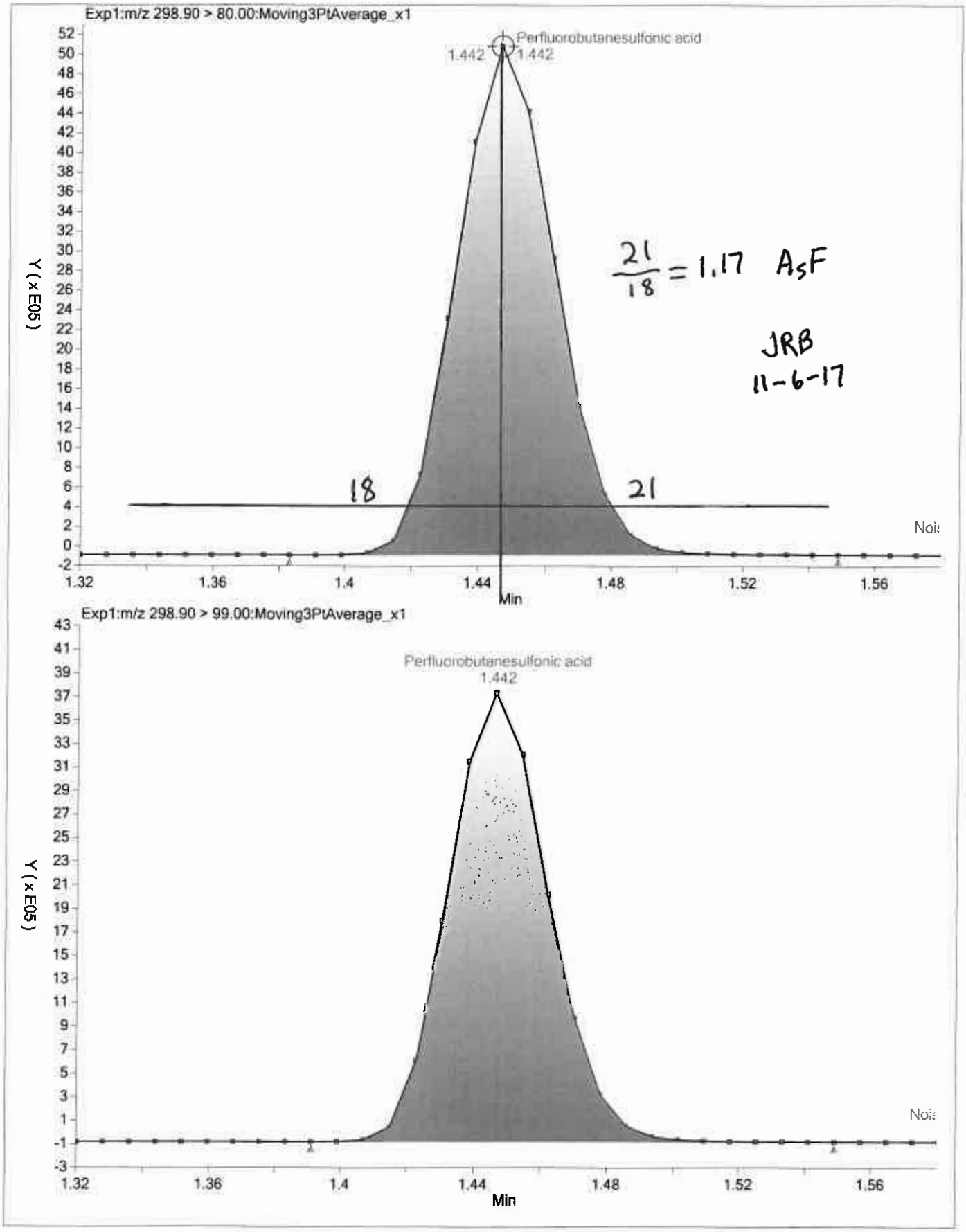
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

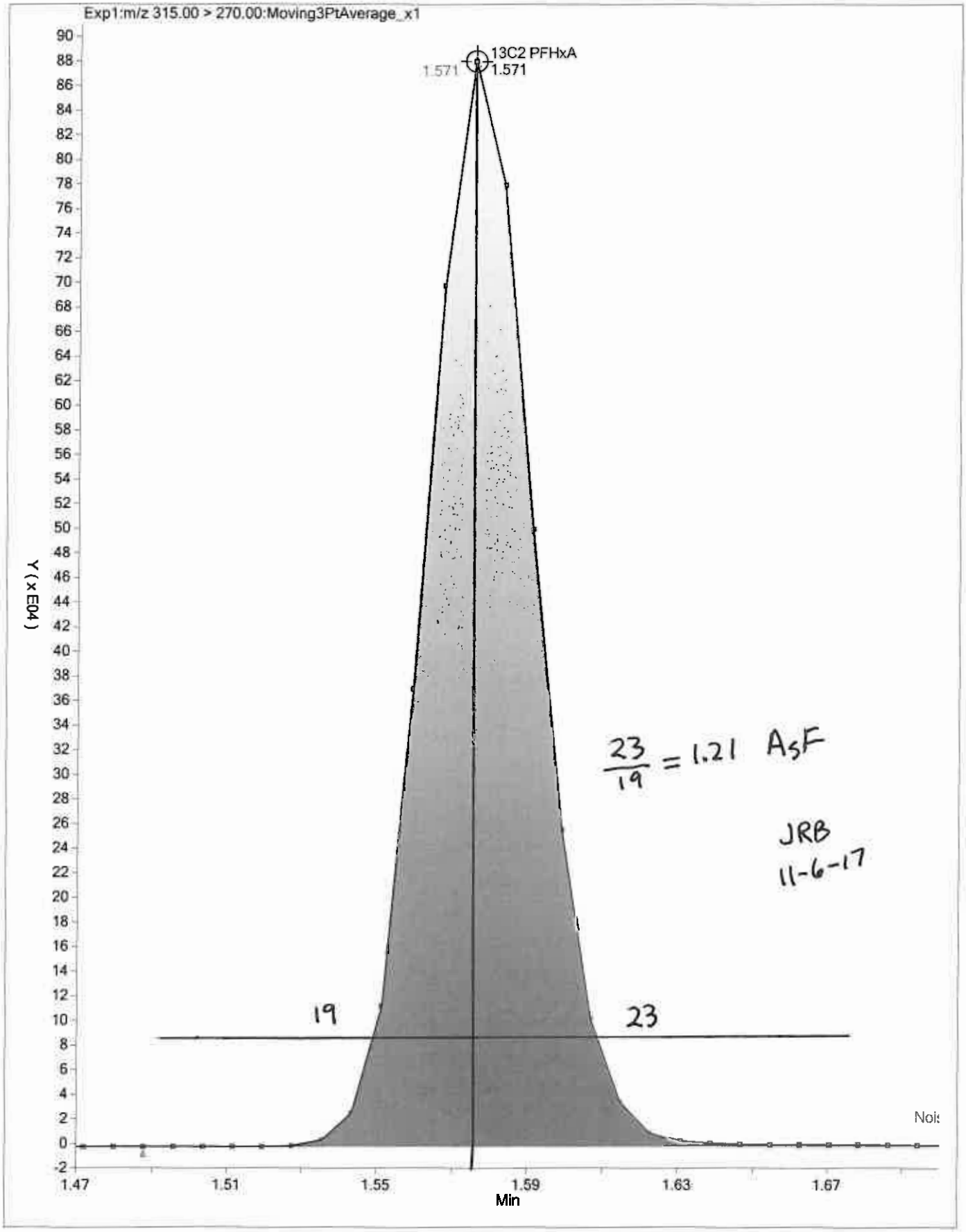
Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

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


Exp1:m/z 298.90 > 80.00:Moving3PtAverage_x1
Perfluorobutanesulfonic acid
1.442
1.442
Y (x E05)
18
21
21/18 = 1.17 AsF
JRB
11-6-17
Min
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
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

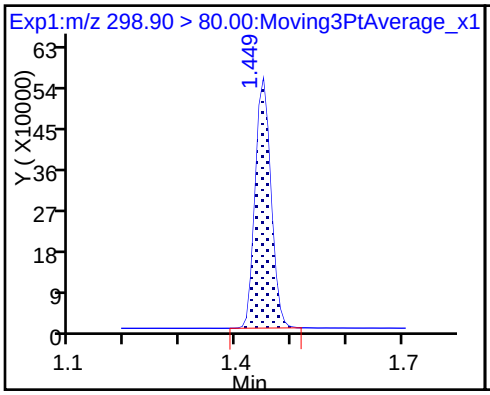
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4

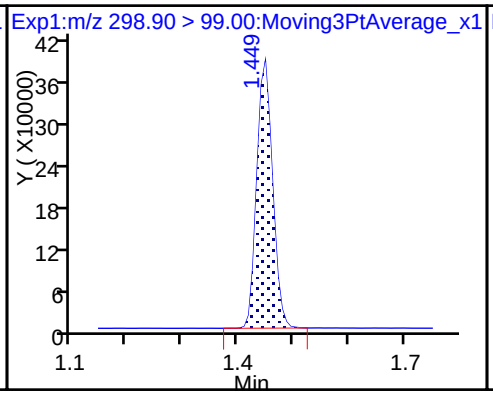
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

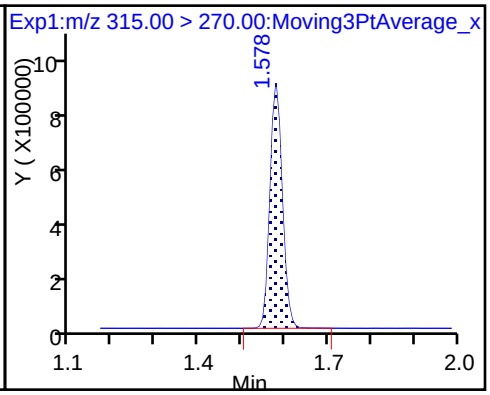
1 Perfluorobutanesulfonic acid



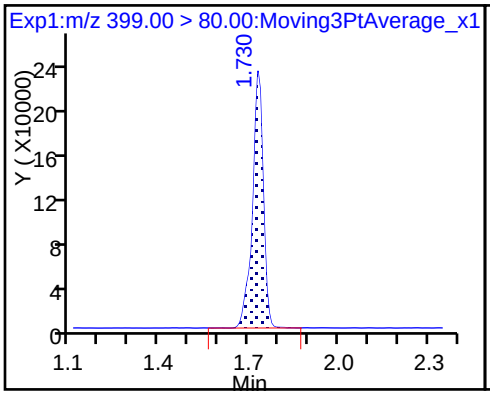
1 Perfluorobutanesulfonic acid



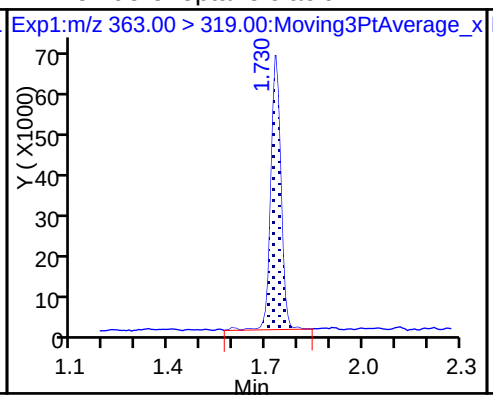
$ 2 13C2 PFHxA



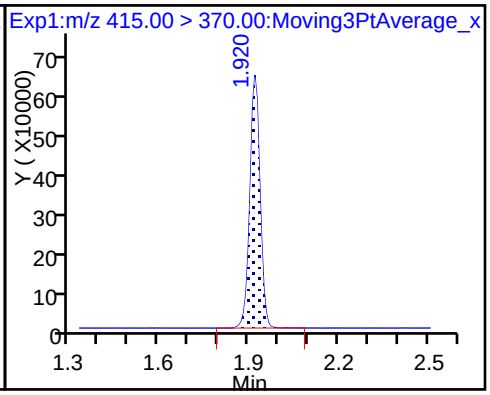
3 Perfluorohexanesulfonic acid



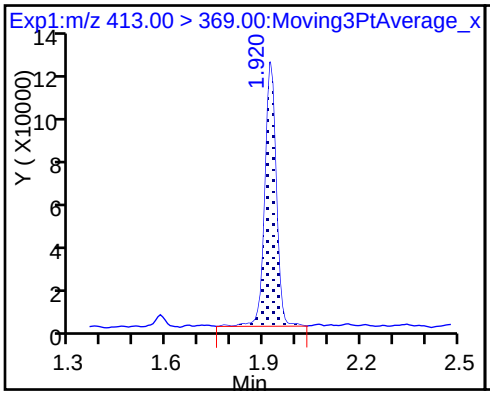
4 Perfluoroheptanoic acid



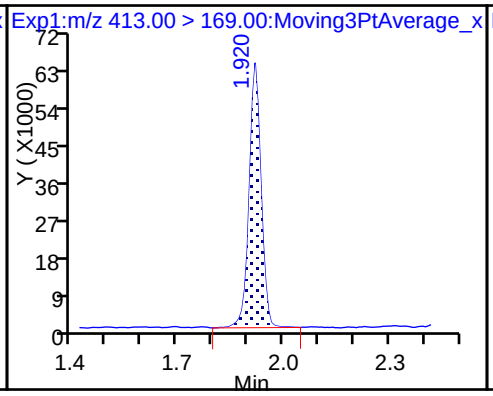
* 6 13C2-PFOA



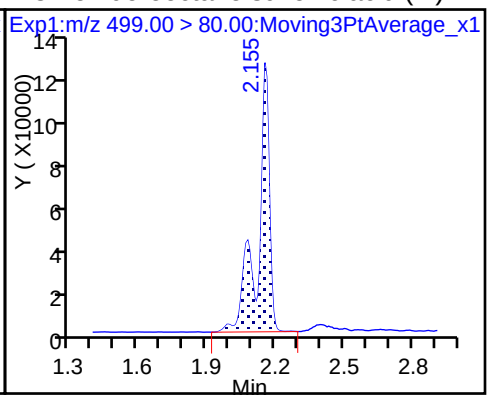
5 Perfluorooctanoic acid



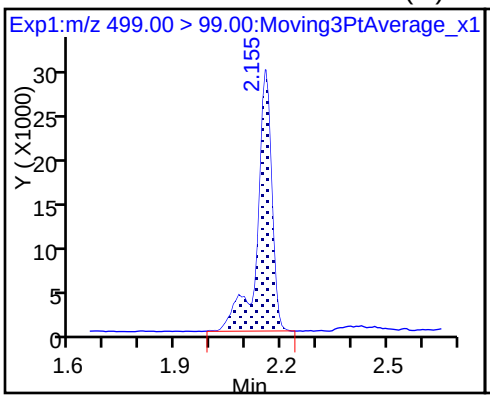
5 Perfluorooctanoic acid



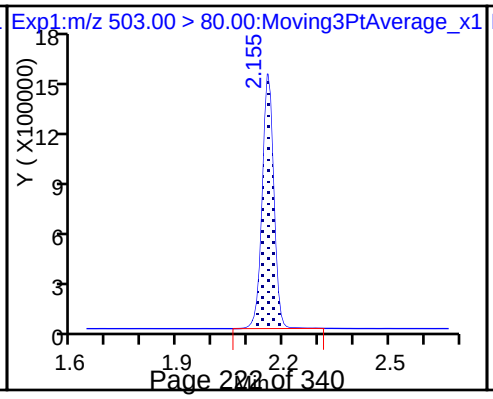
8 Perfluorooctane sulfonic acid (M)



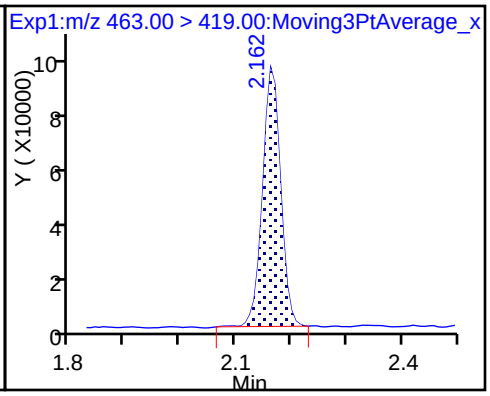
8 Perfluorooctane sulfonic acid (M)



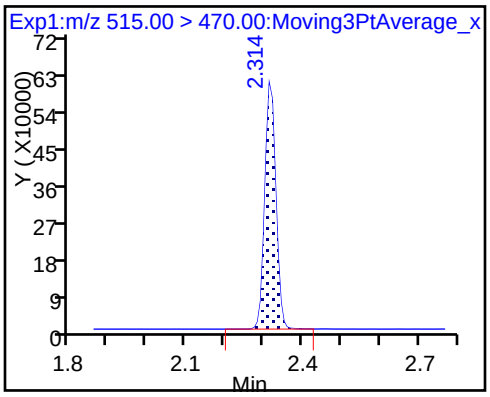
* 7 13C4 PFOS



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

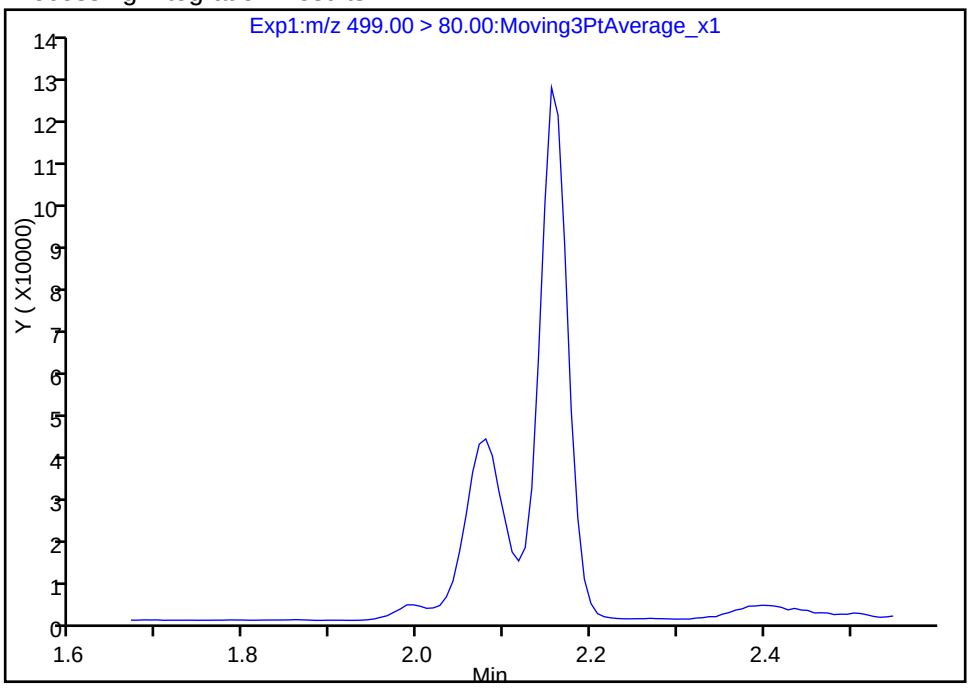
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_004.d
Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

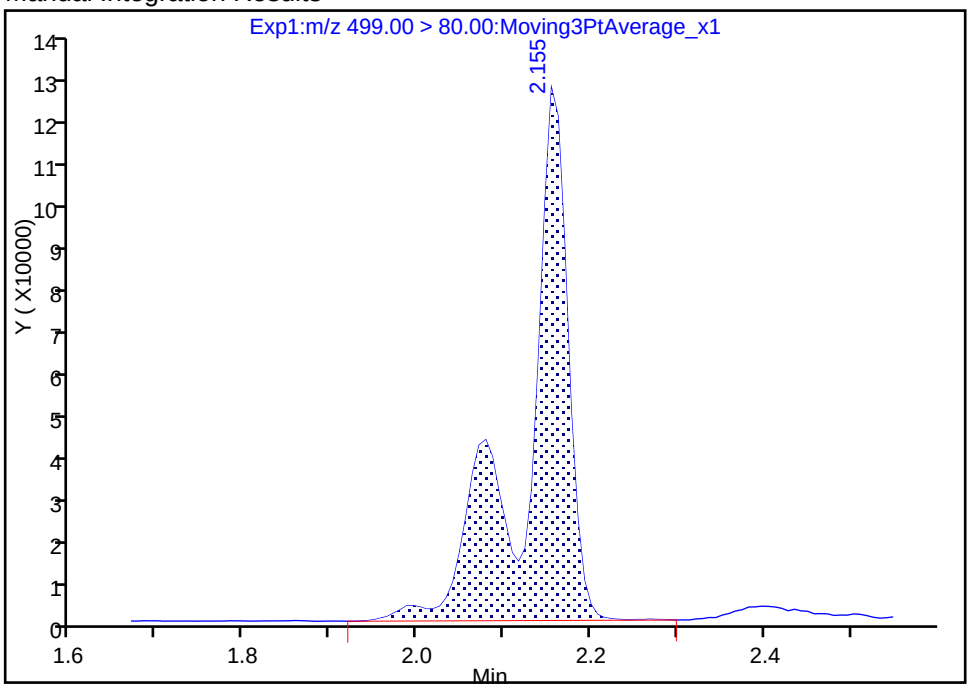
Not Detected
Expected RT: 2.15

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

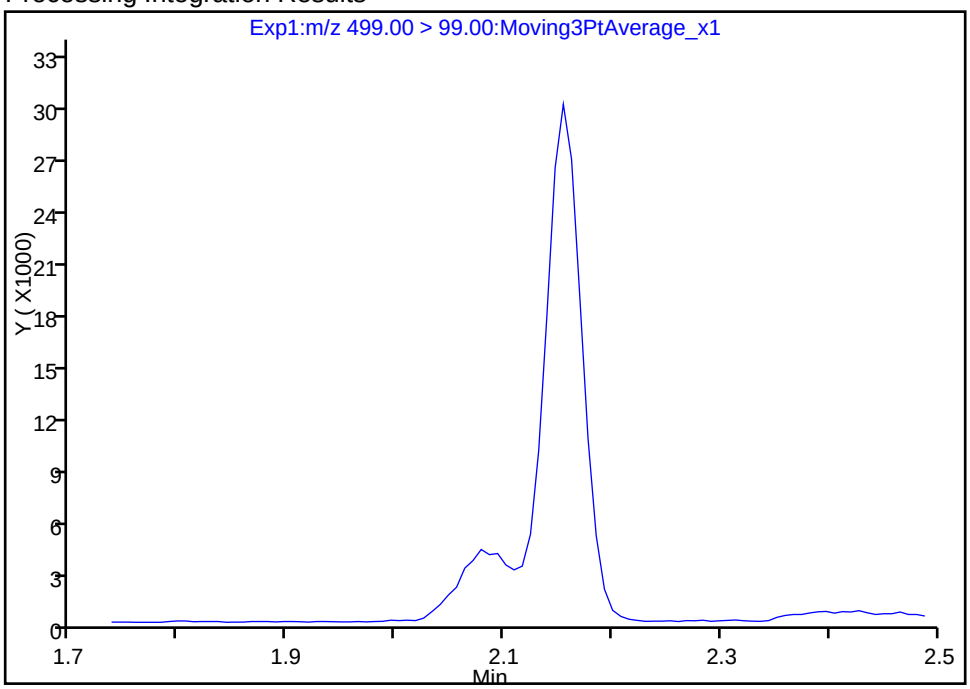
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_004.d
Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

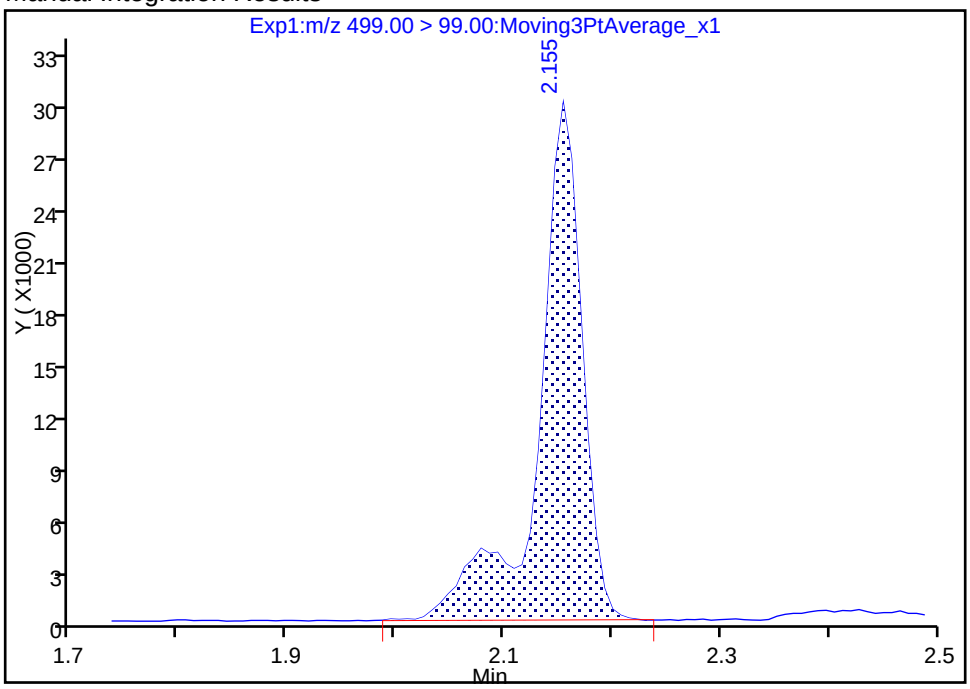
Not Detected
Expected RT: 2.15

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

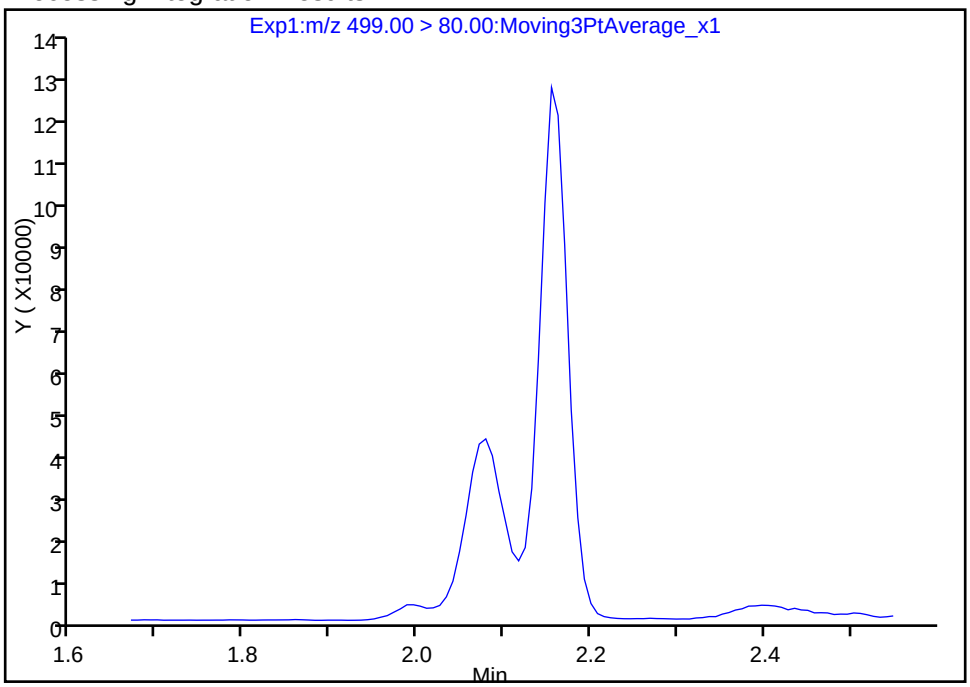
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_004.d
Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

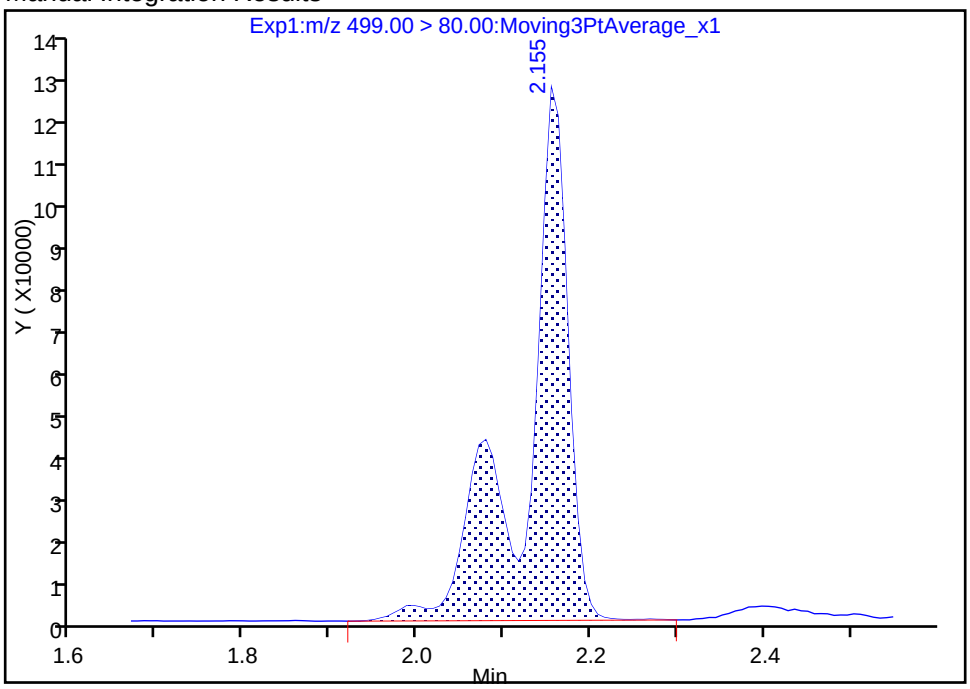
Not Detected
Expected RT: 2.15

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

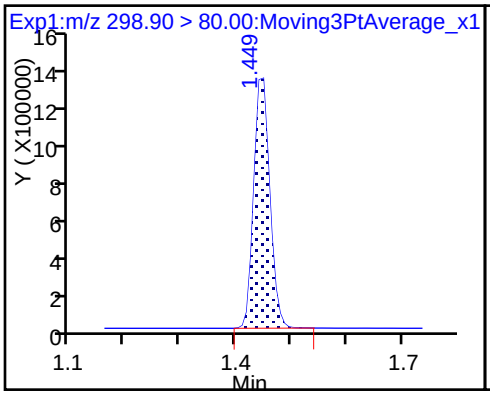
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5

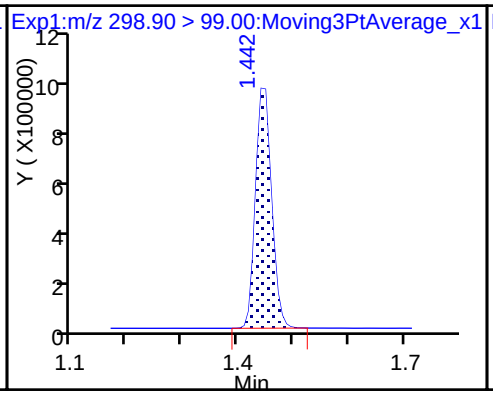
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

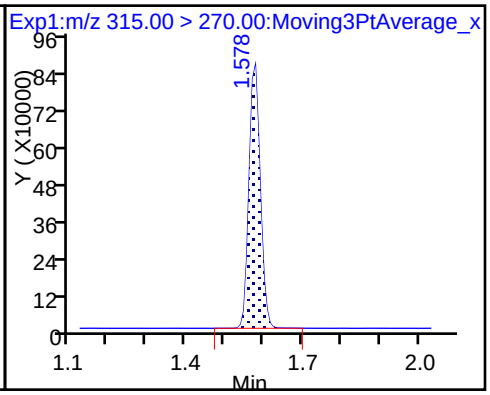
1 Perfluorobutanesulfonic acid



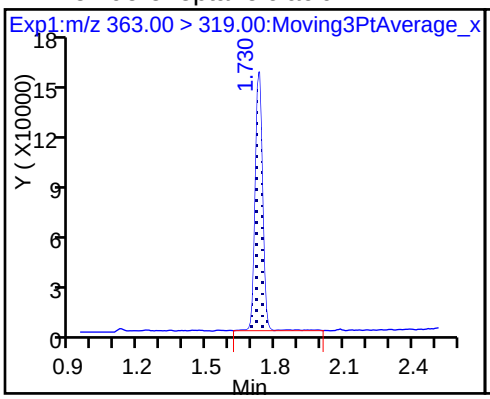
1 Perfluorobutanesulfonic acid



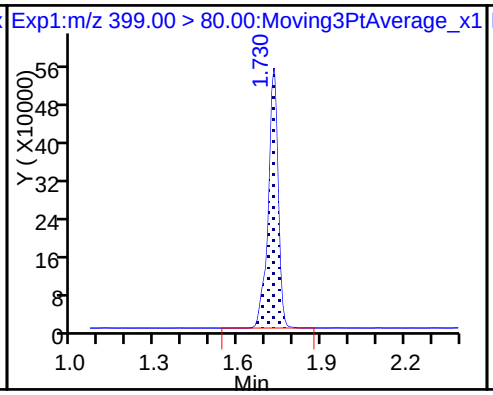
$ 2 13C2 PFHxA



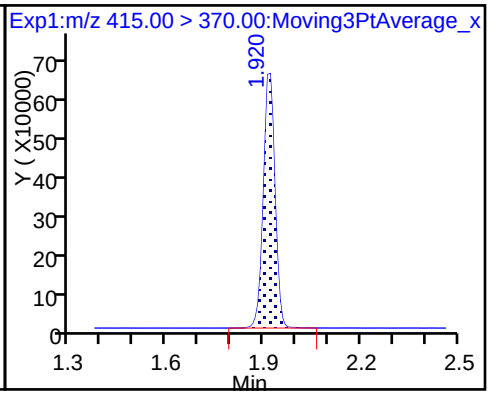
4 Perfluoroheptanoic acid



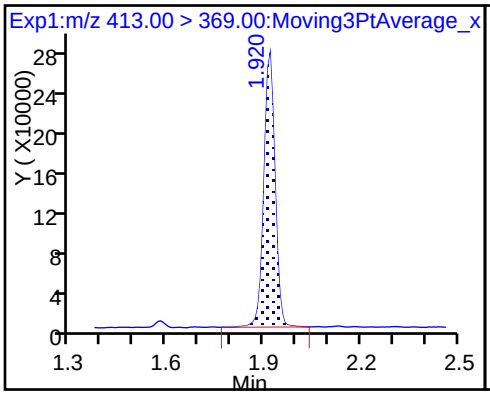
3 Perfluorohexanesulfonic acid



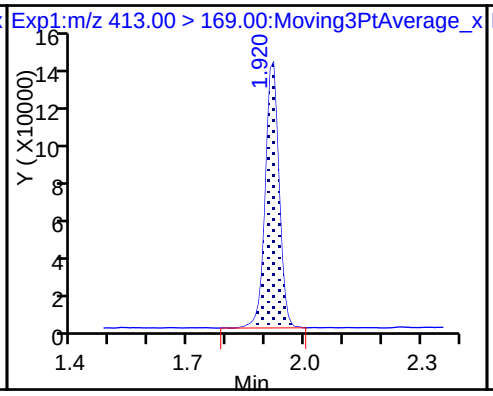
* 6 13C2-PFOA



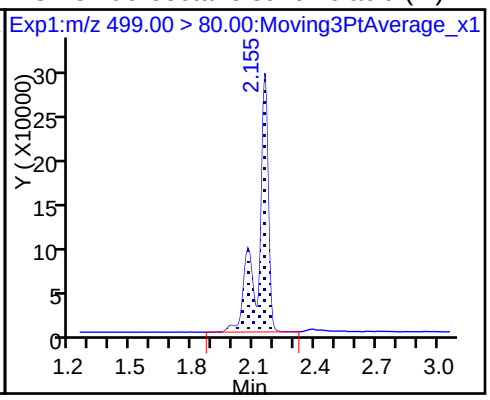
5 Perfluorooctanoic acid



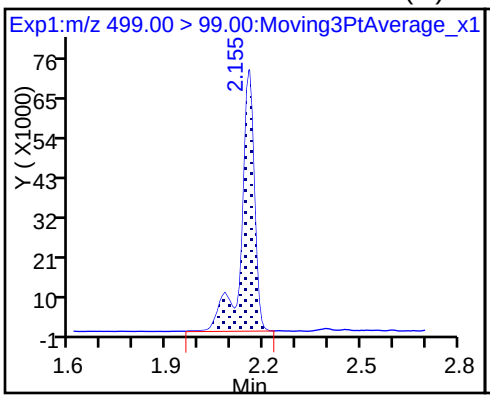
5 Perfluorooctanoic acid



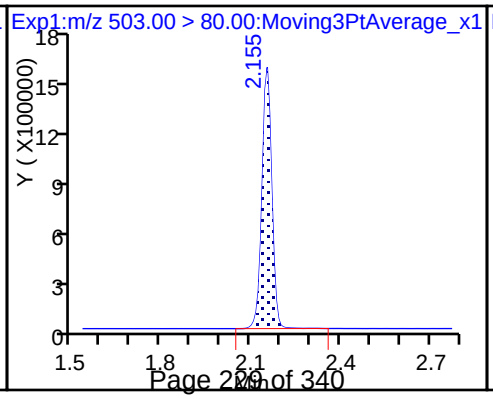
8 Perfluorooctane sulfonic acid (M)



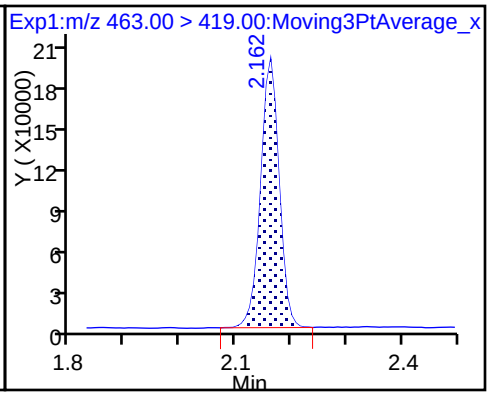
8 Perfluorooctane sulfonic acid (M)



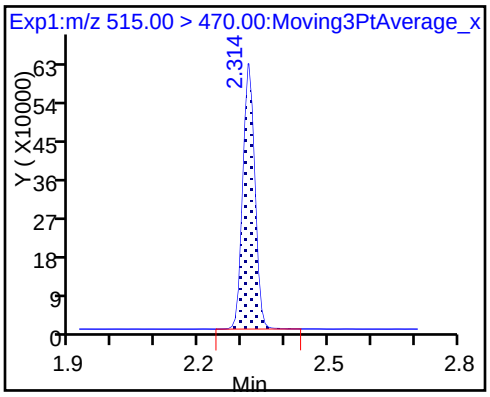
* 7 13C4 PFOS



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

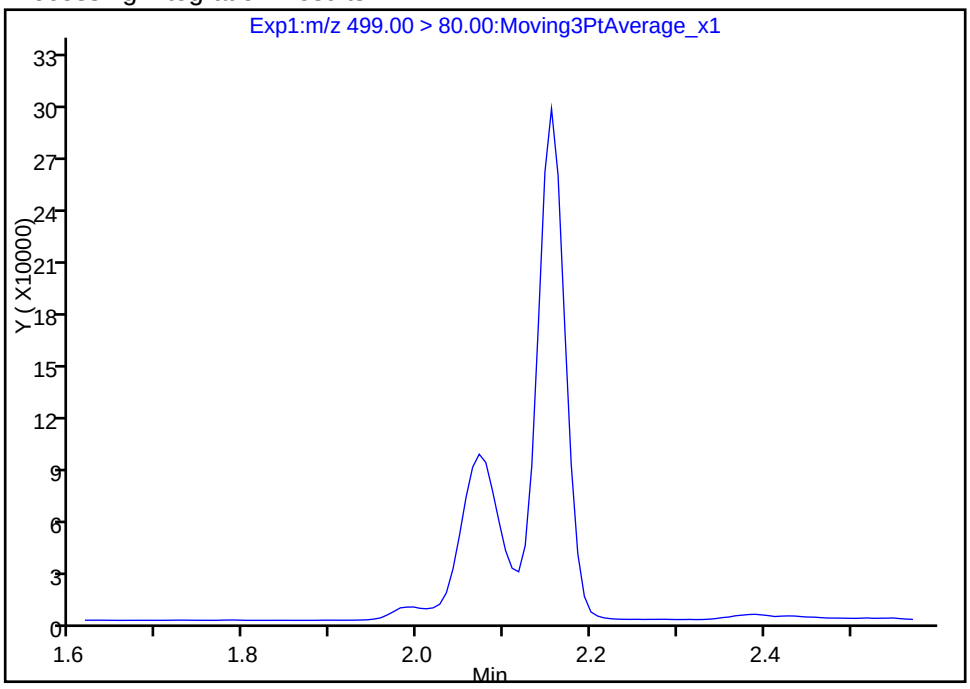
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_005.d				
Injection Date:	03-Nov-2017 13:42:39	Instrument ID:	A8_N		
Lims ID:	IC L2				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	2	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

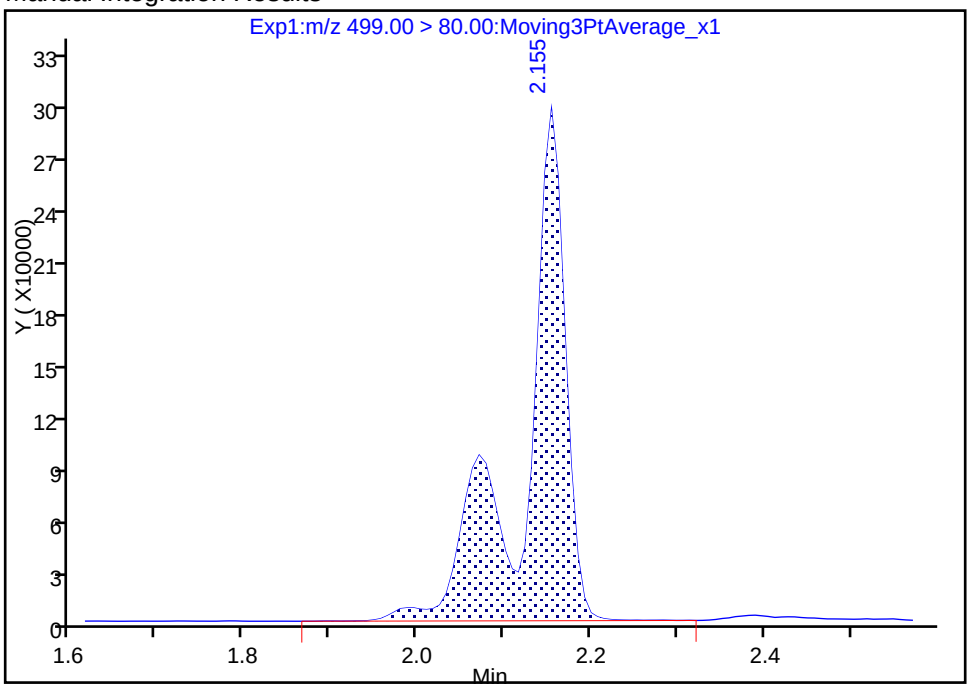
Not Detected
Expected RT: 2.15

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

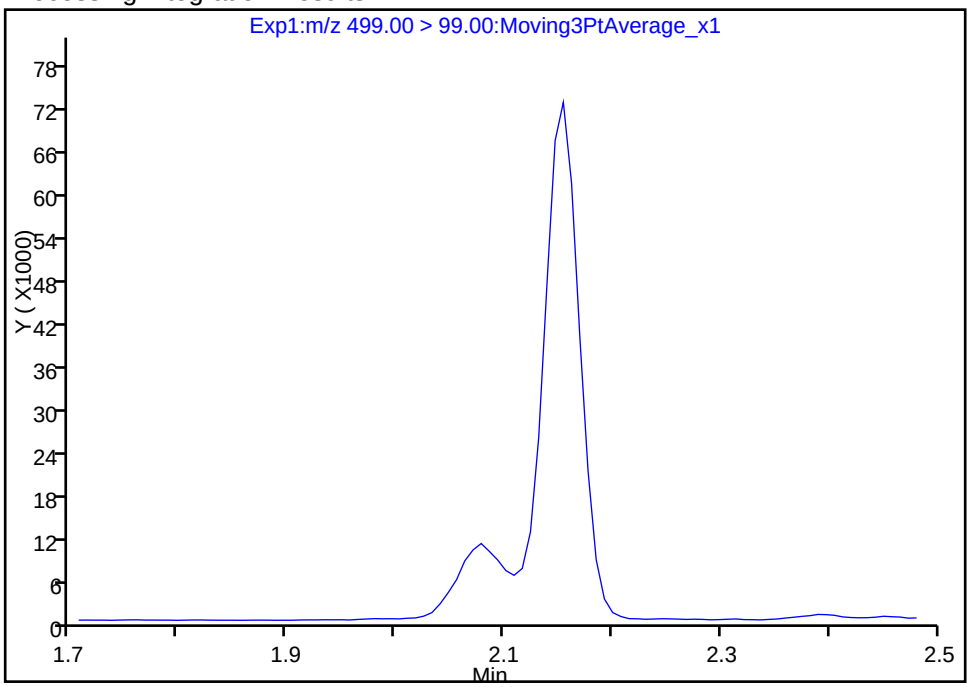
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_005.d
Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

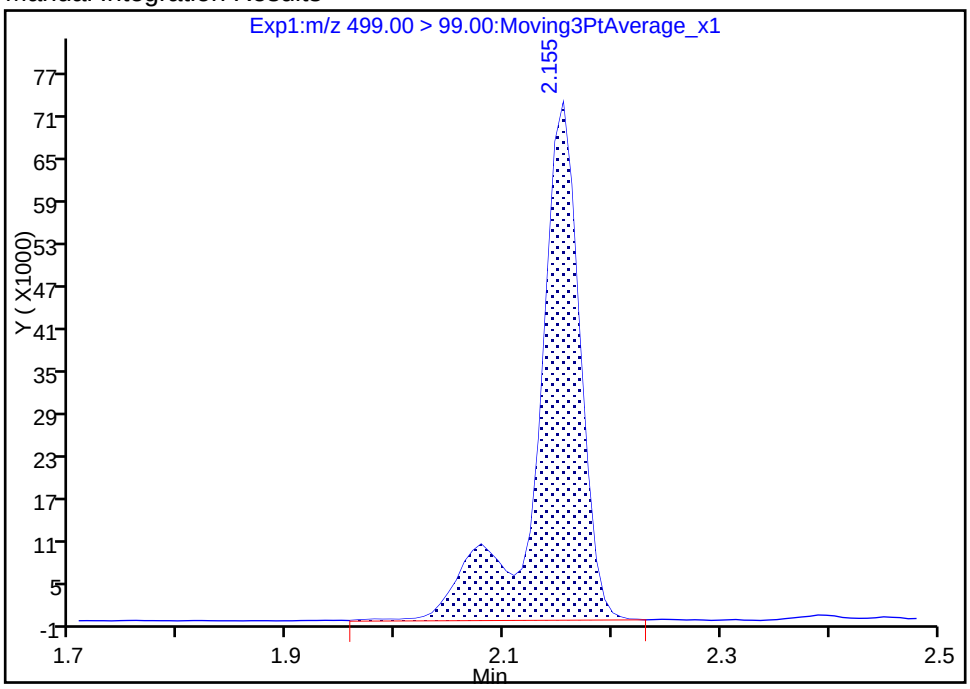
Not Detected
Expected RT: 2.15

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

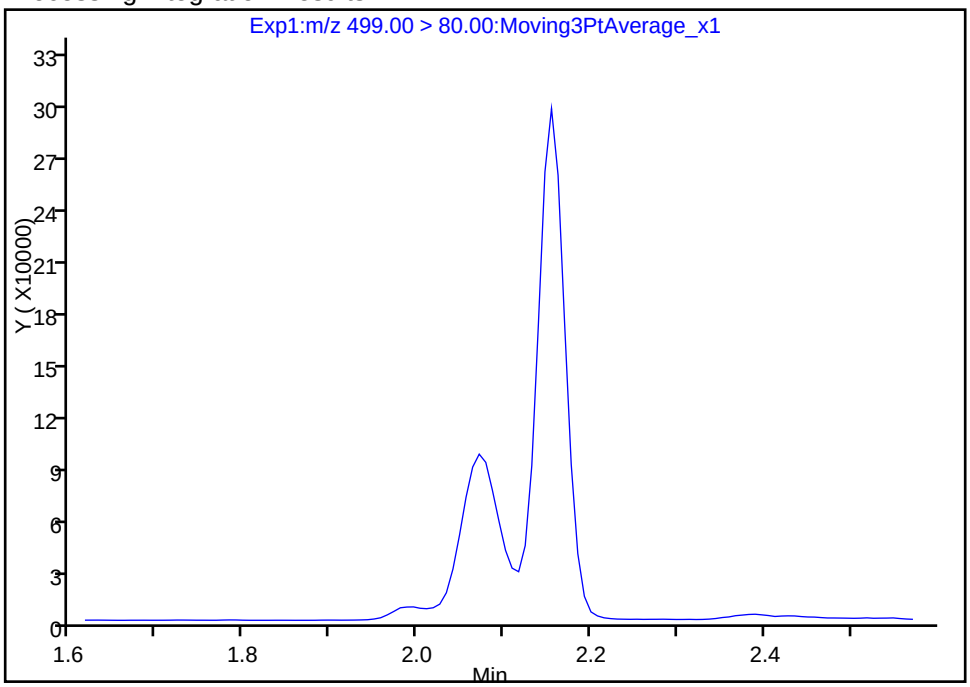
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_005.d
Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

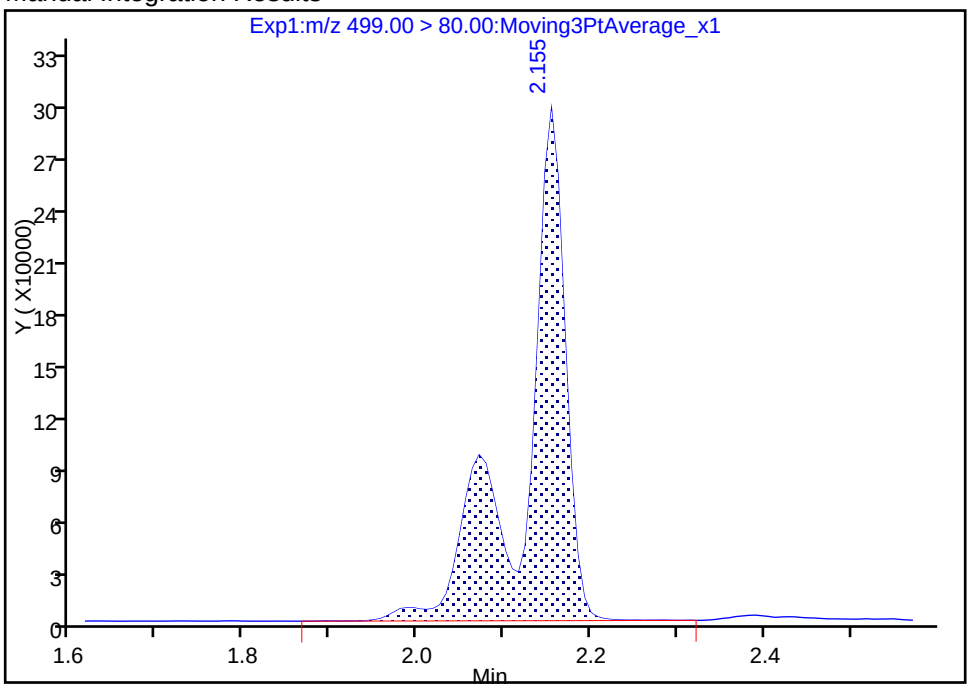
Not Detected
Expected RT: 2.15

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

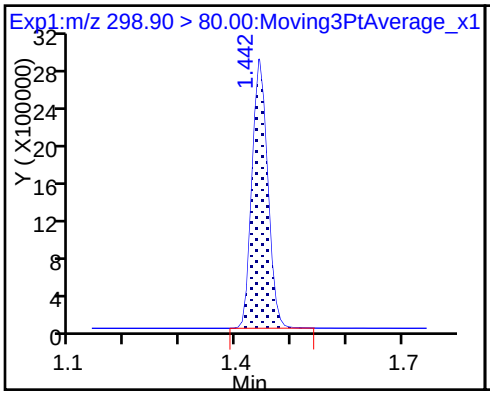
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6

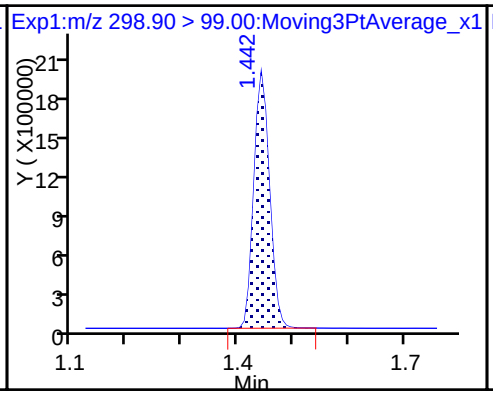
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

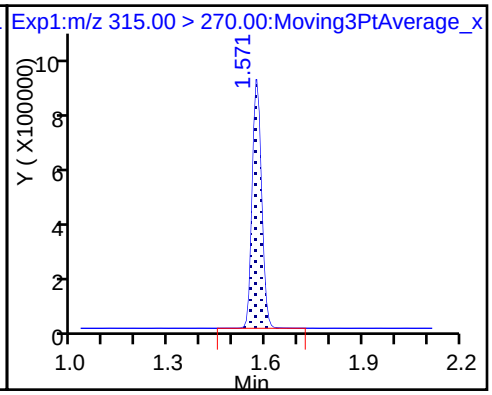
1 Perfluorobutanesulfonic acid



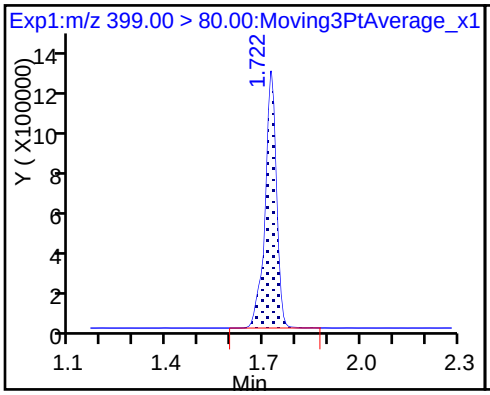
1 Perfluorobutanesulfonic acid



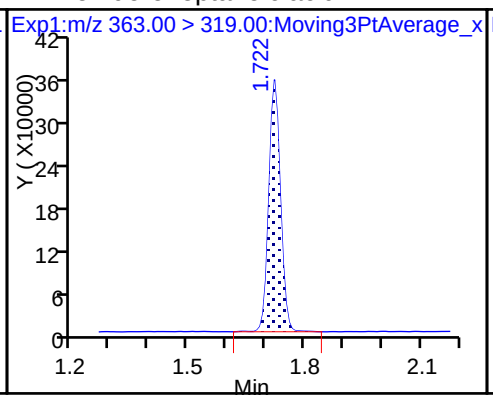
$ 2 13C2 PFHxA



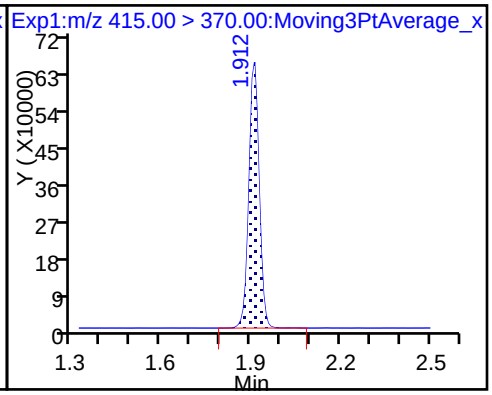
3 Perfluorohexanesulfonic acid



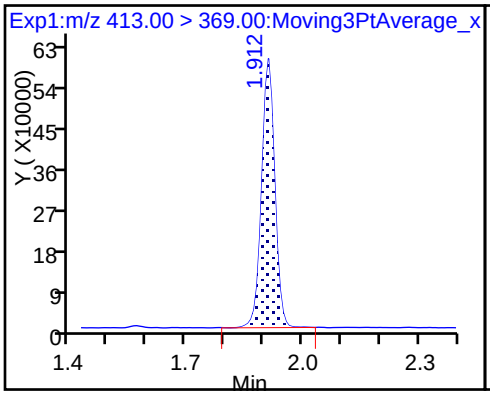
4 Perfluoroheptanoic acid



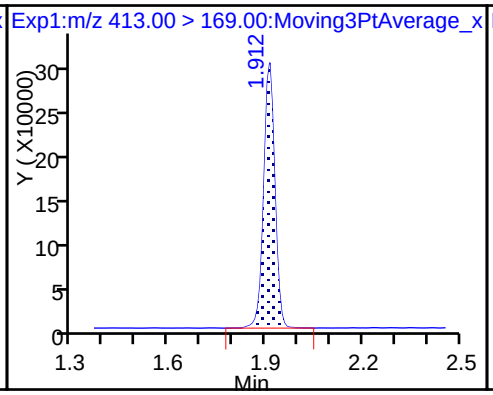
* 6 13C2-PFOA



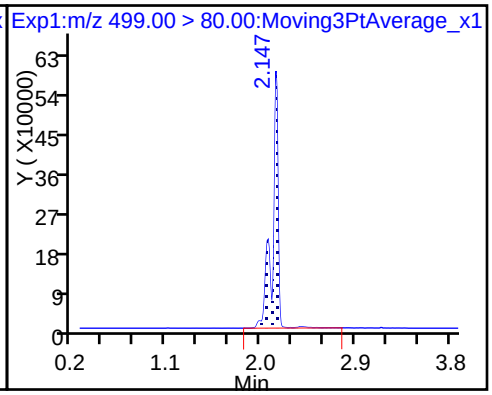
5 Perfluorooctanoic acid



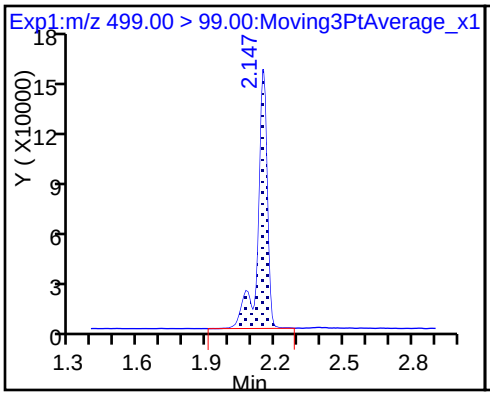
5 Perfluorooctanoic acid



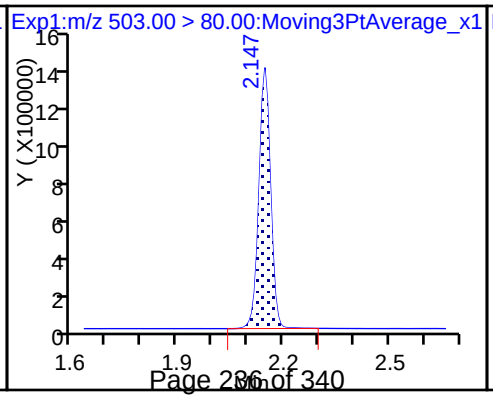
8 Perfluorooctane sulfonic acid



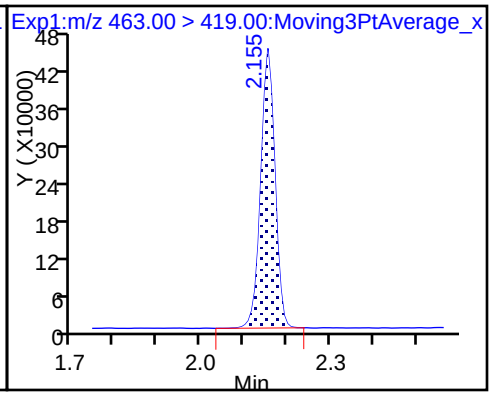
8 Perfluorooctane sulfonic acid



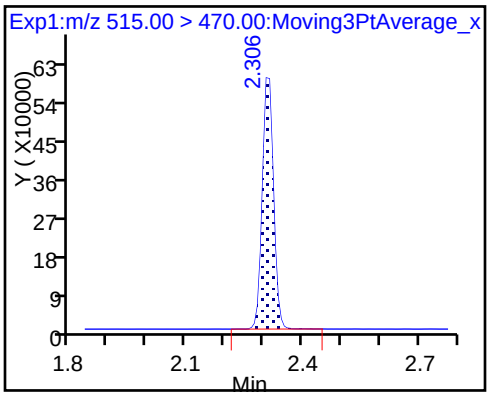
* 7 13C4 PFOS



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

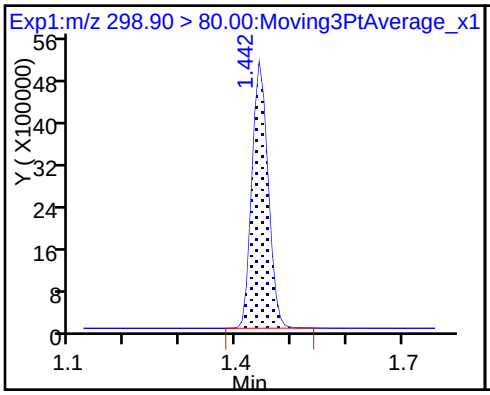
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7

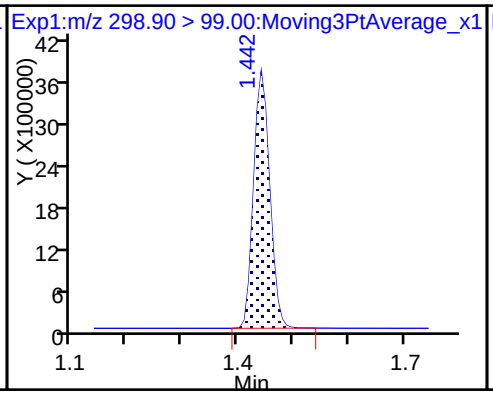
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

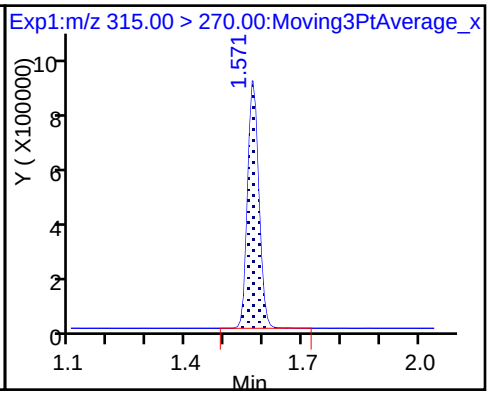
1 Perfluorobutanesulfonic acid



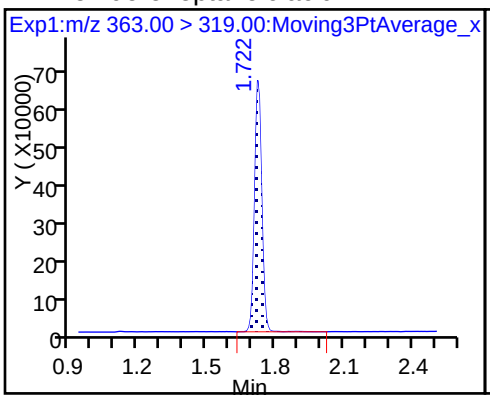
1 Perfluorobutanesulfonic acid



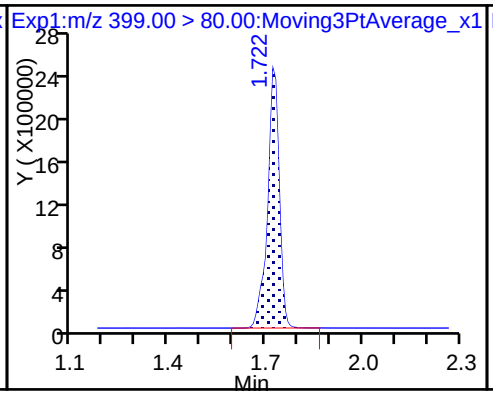
$ 2 13C2 PFHxA



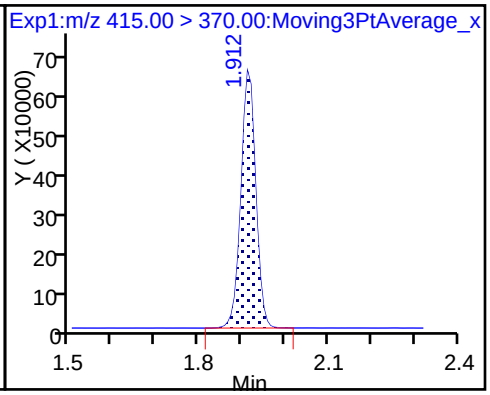
4 Perfluoroheptanoic acid



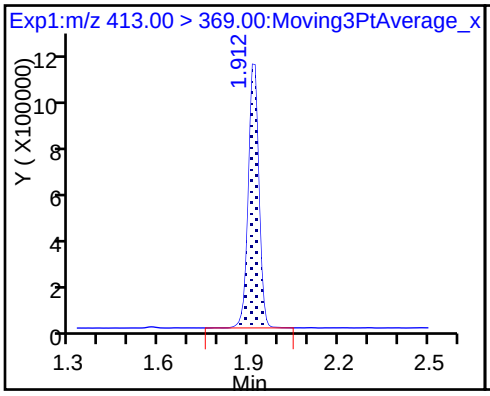
3 Perfluorohexanesulfonic acid



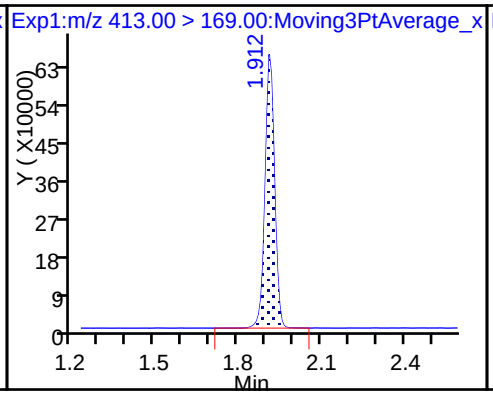
* 6 13C2-PFOA



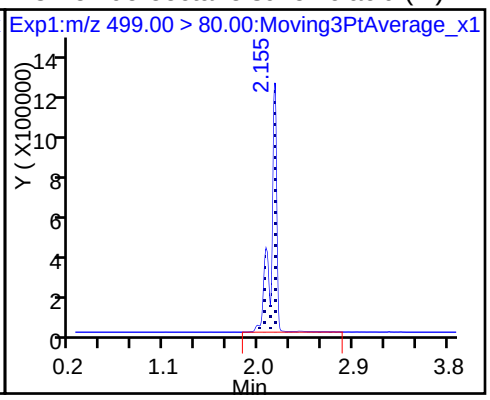
5 Perfluorooctanoic acid



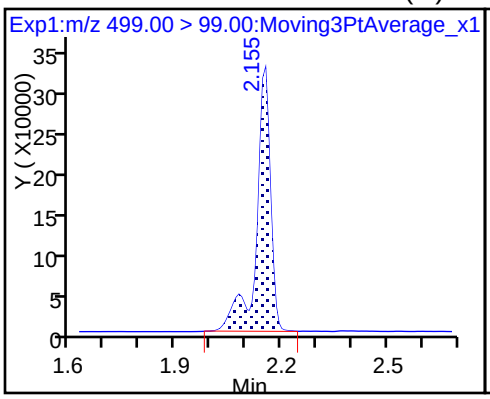
5 Perfluorooctanoic acid



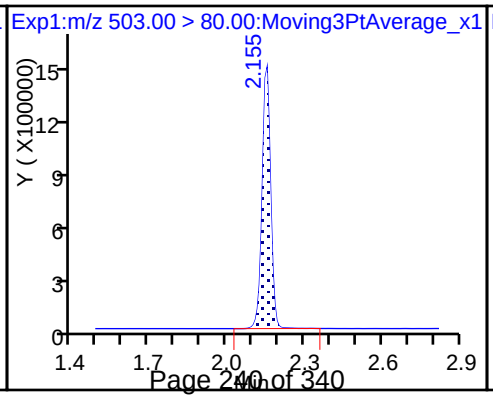
8 Perfluorooctane sulfonic acid (M)



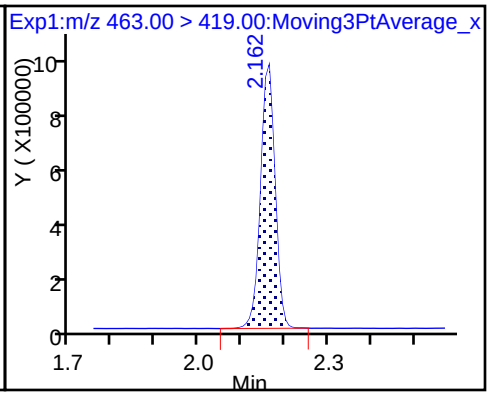
8 Perfluorooctane sulfonic acid (M)



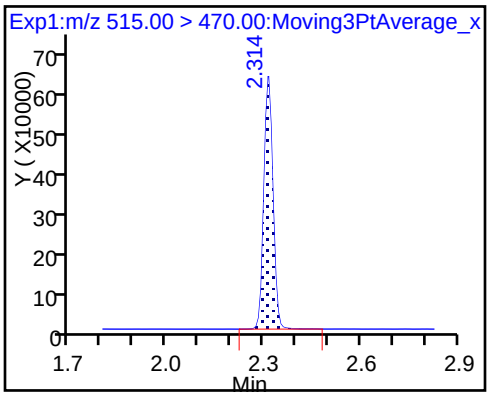
* 7 13C4 PFOS



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

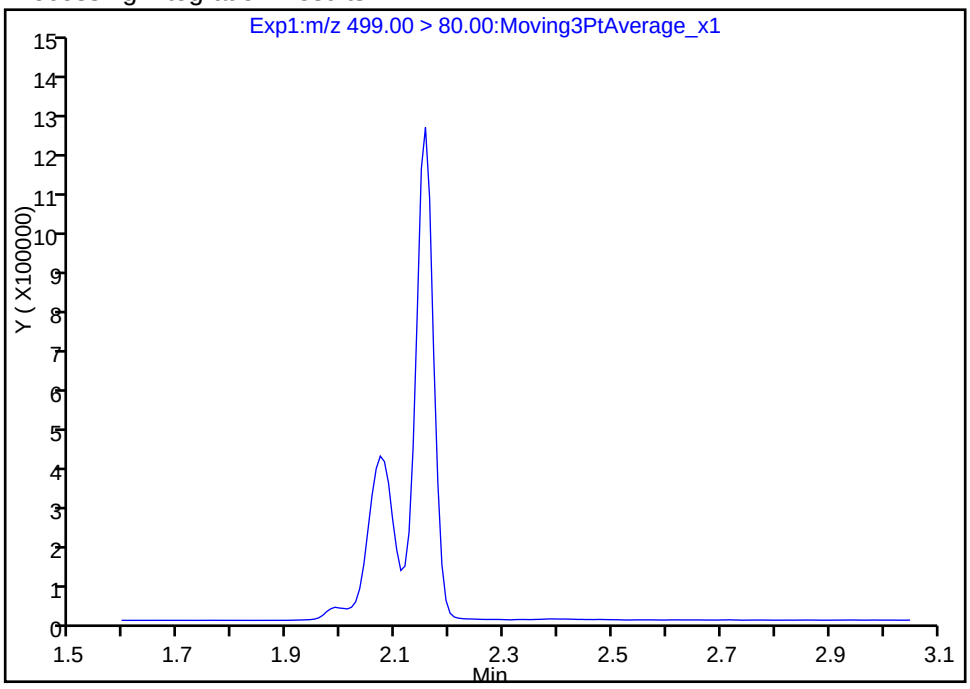
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_007.d
Injection Date: 03-Nov-2017 13:52:00 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

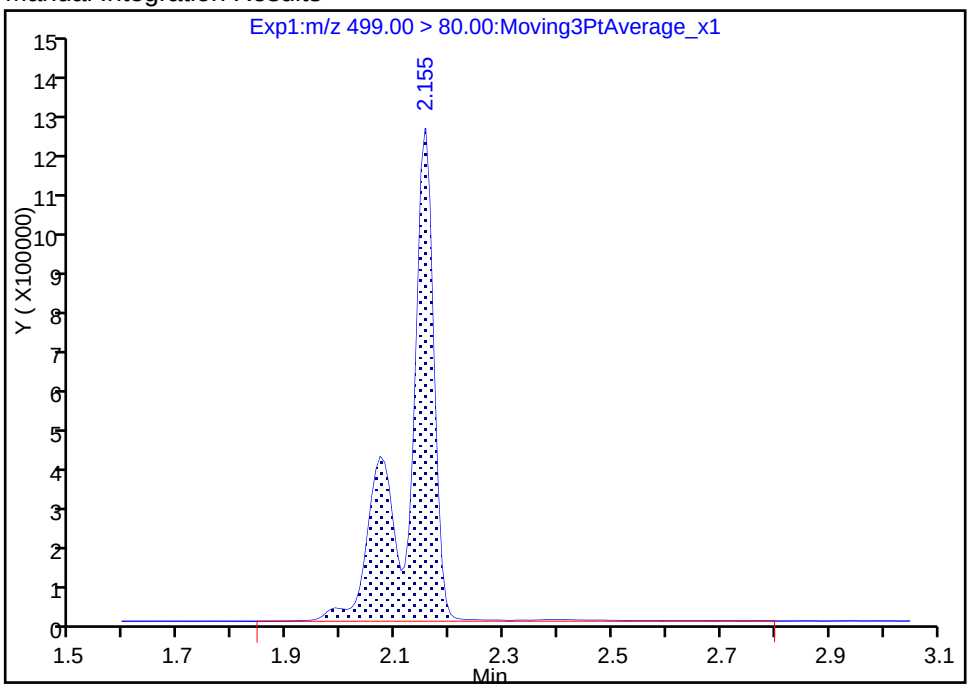
Not Detected
Expected RT: 2.15

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

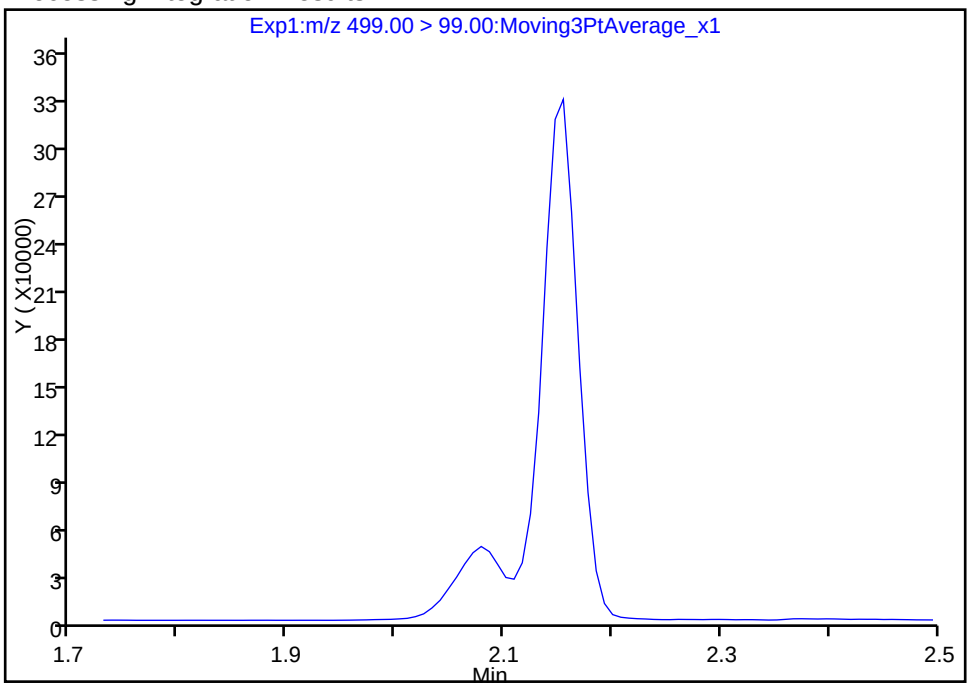
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_007.d
Injection Date: 03-Nov-2017 13:52:00 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

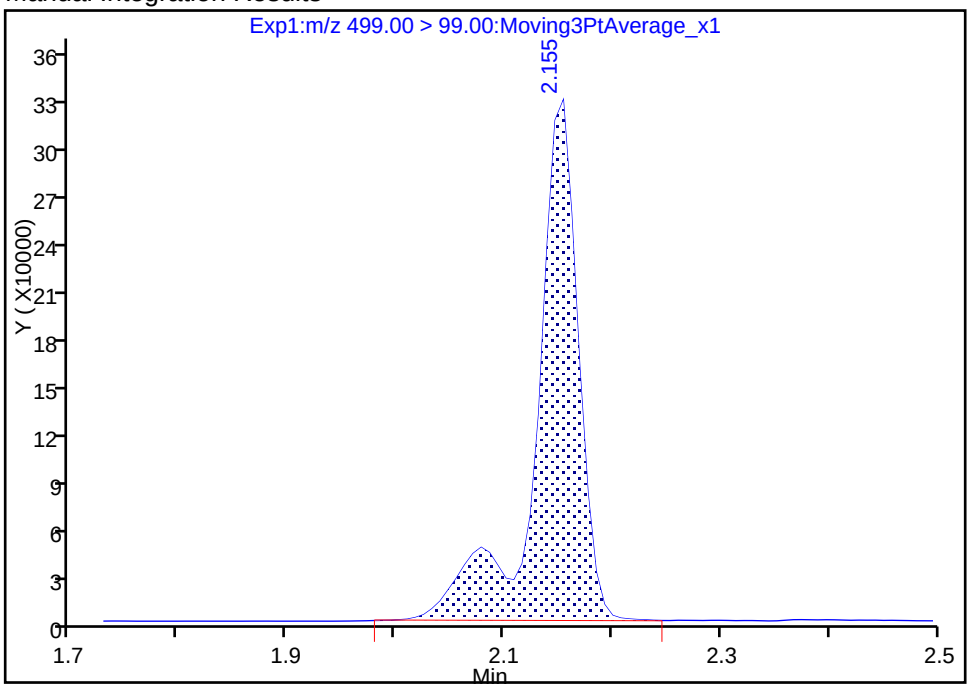
Not Detected
Expected RT: 2.15

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

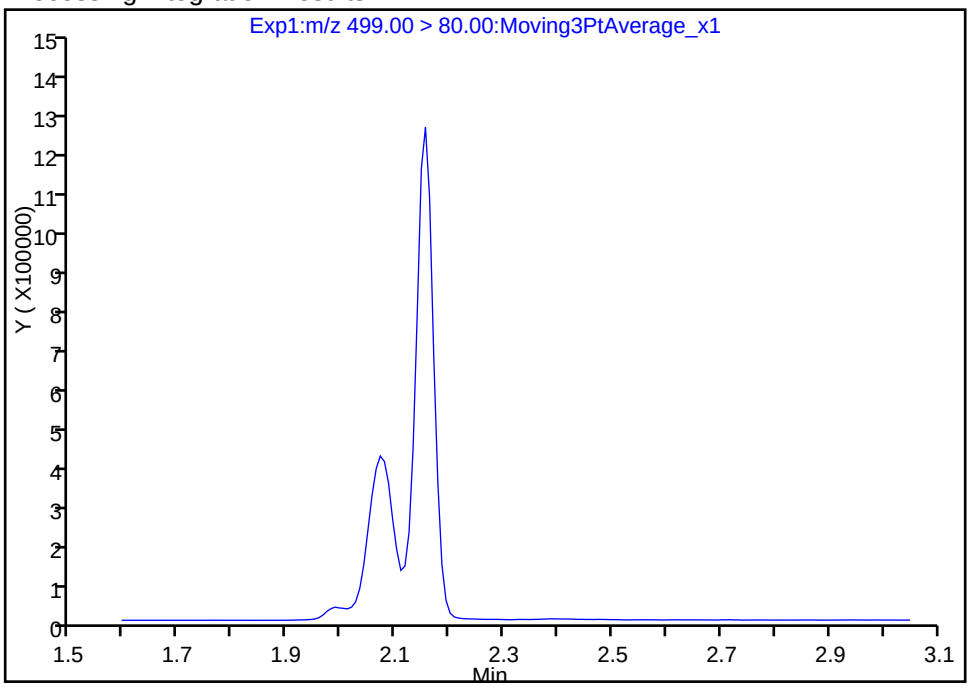
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_007.d
Injection Date: 03-Nov-2017 13:52:00 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

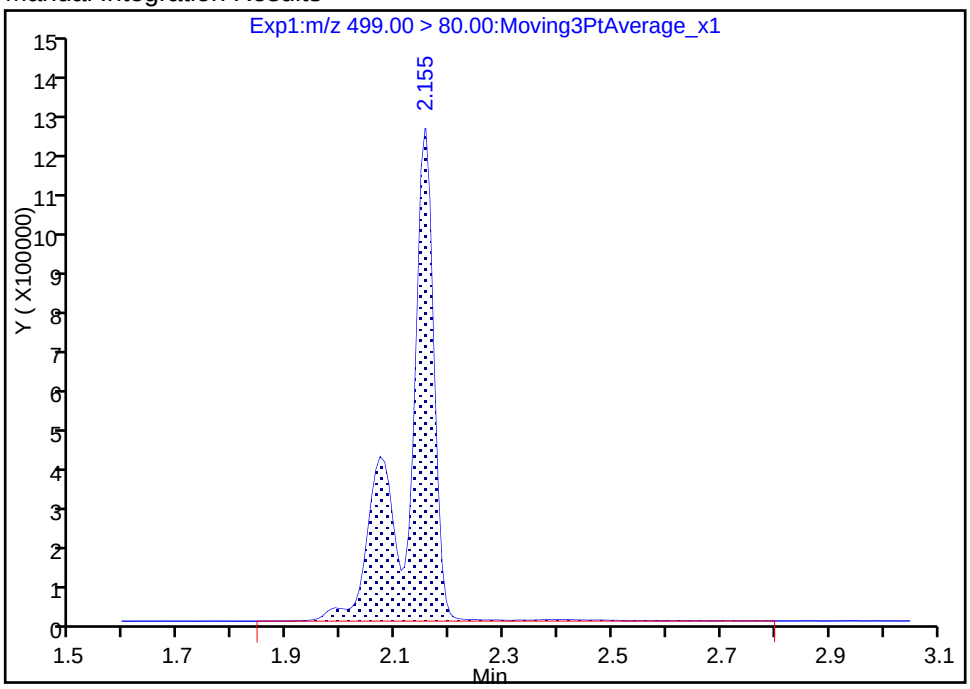
Not Detected
Expected RT: 2.15

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

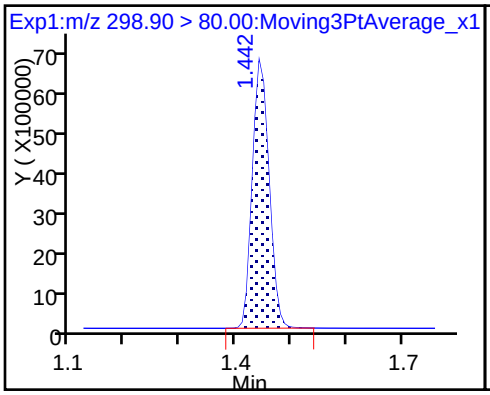
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8

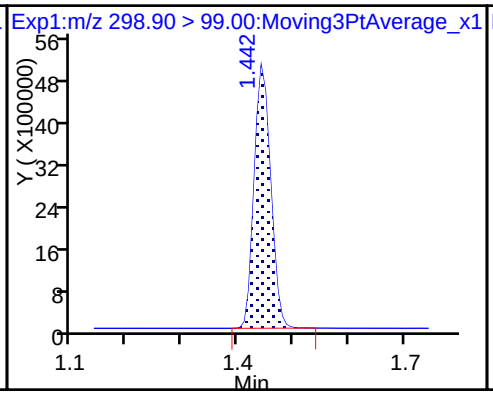
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

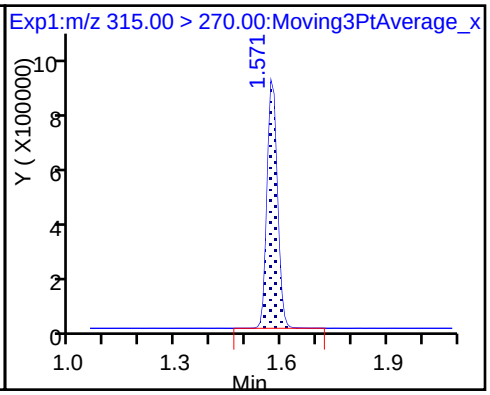
1 Perfluorobutanesulfonic acid



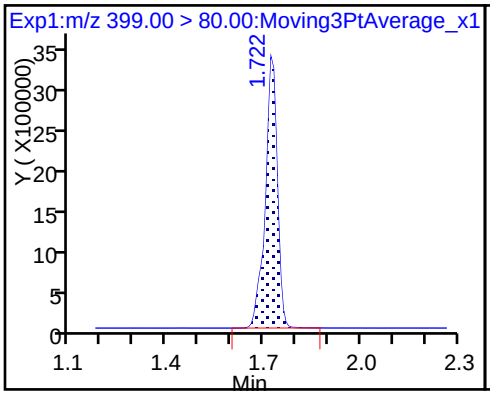
1 Perfluorobutanesulfonic acid



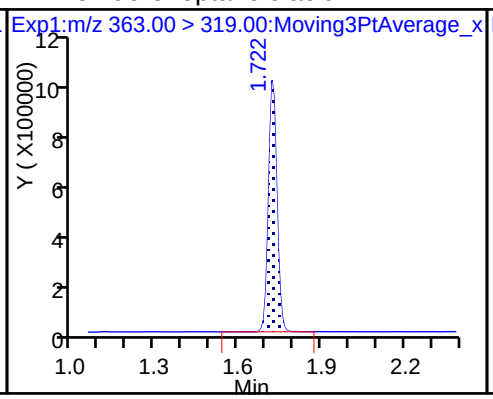
$ 2 13C2 PFHxA



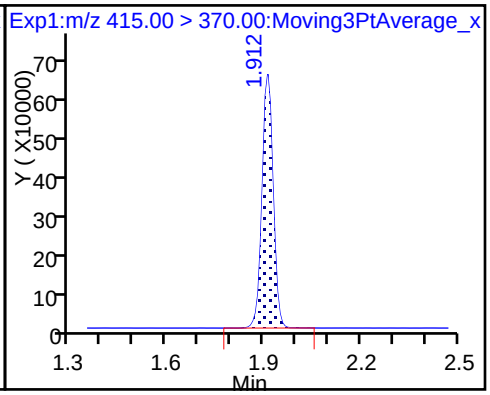
3 Perfluorohexanesulfonic acid



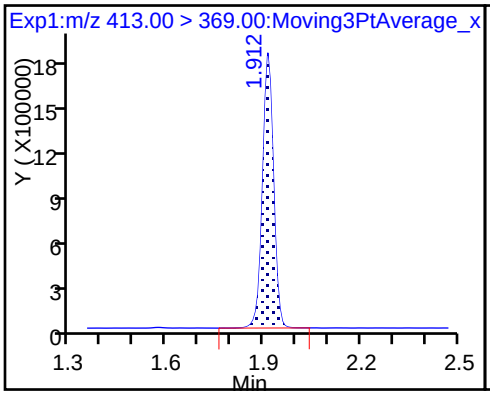
4 Perfluoroheptanoic acid



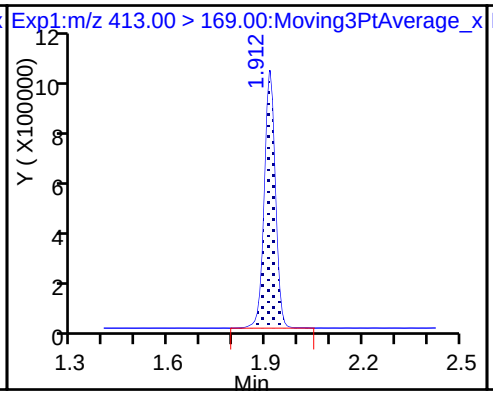
* 6 13C2-PFOA



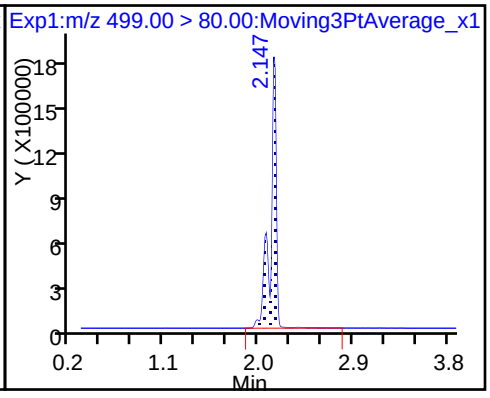
5 Perfluorooctanoic acid



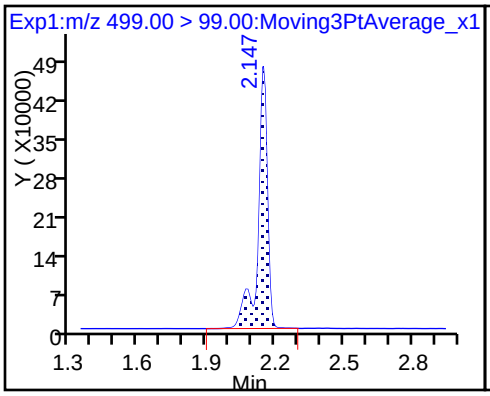
5 Perfluorooctanoic acid



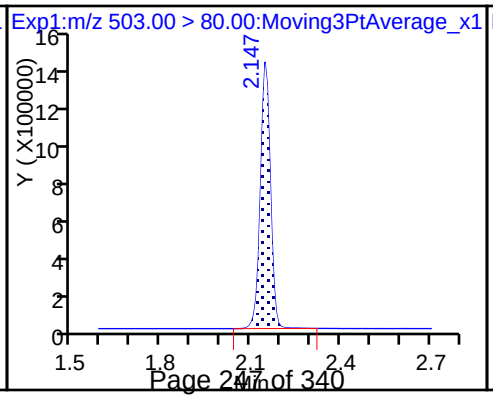
8 Perfluorooctane sulfonic acid



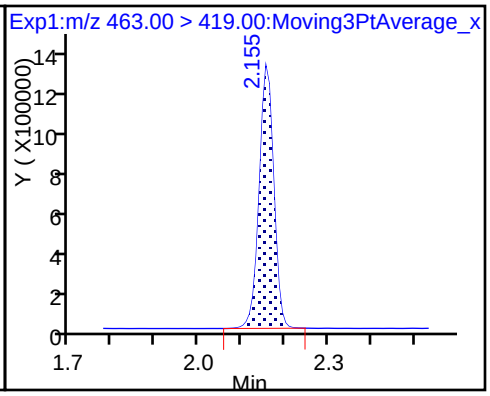
8 Perfluorooctane sulfonic acid



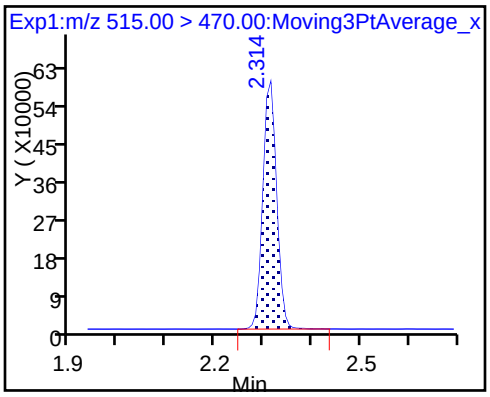
* 7 13C4 PFOS



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

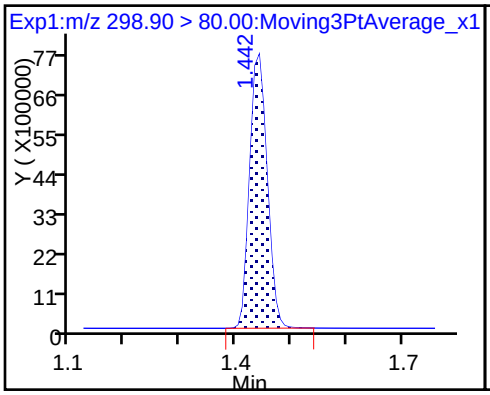
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 9

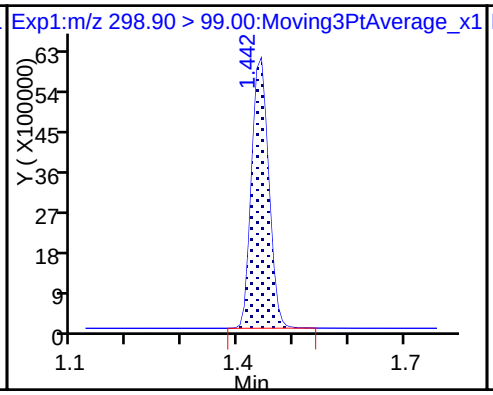
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

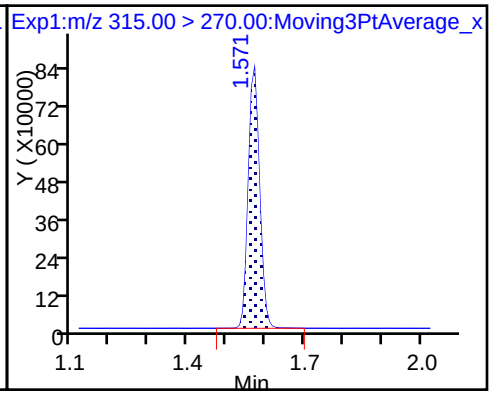
1 Perfluorobutanesulfonic acid



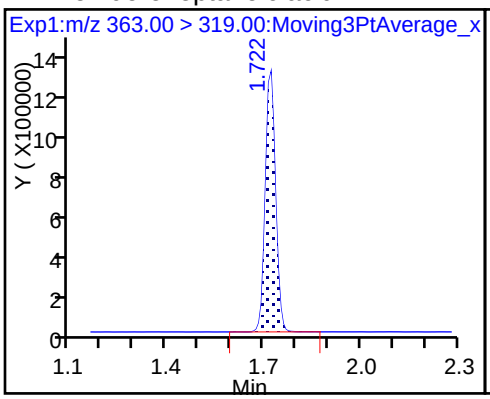
1 Perfluorobutanesulfonic acid



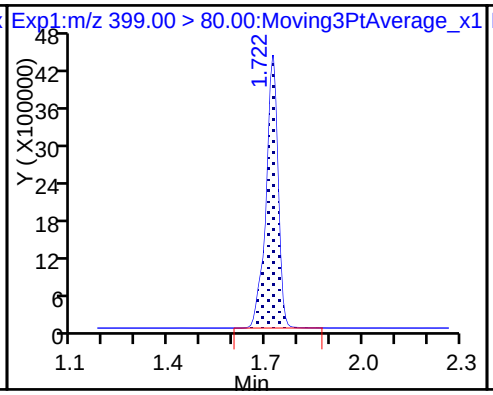
$ 2 13C2 PFHxA



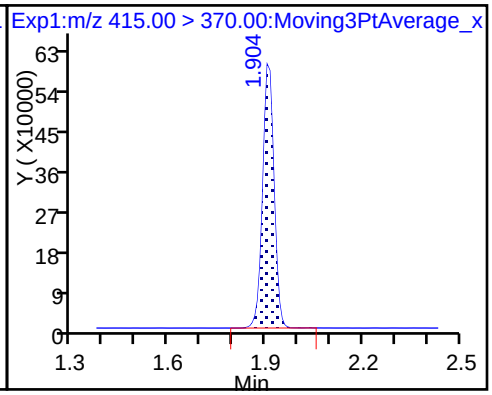
4 Perfluoroheptanoic acid



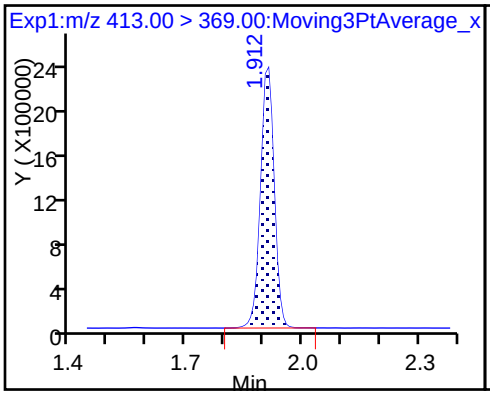
3 Perfluorohexanesulfonic acid



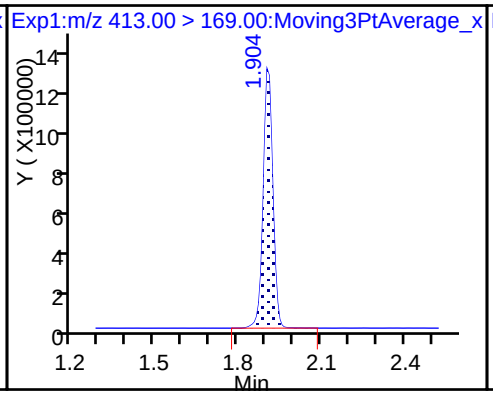
* 6 13C2-PFOA



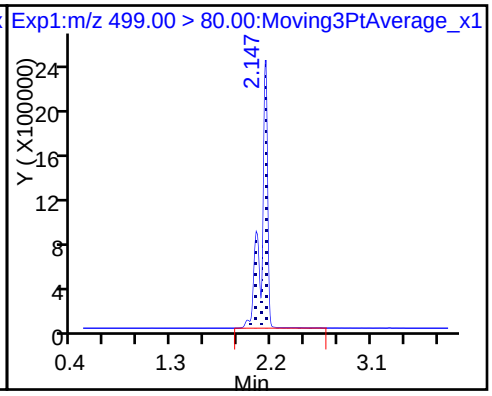
5 Perfluorooctanoic acid



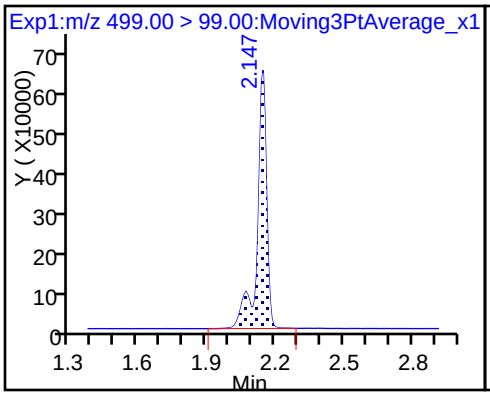
5 Perfluorooctanoic acid



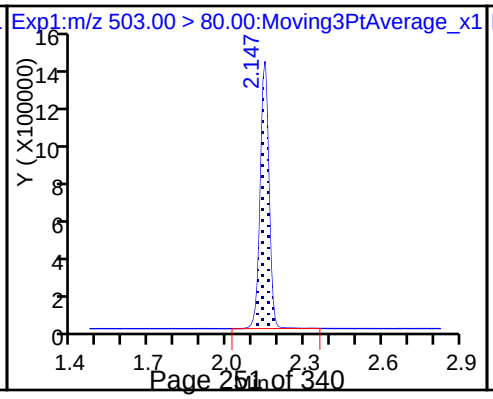
8 Perfluorooctane sulfonic acid



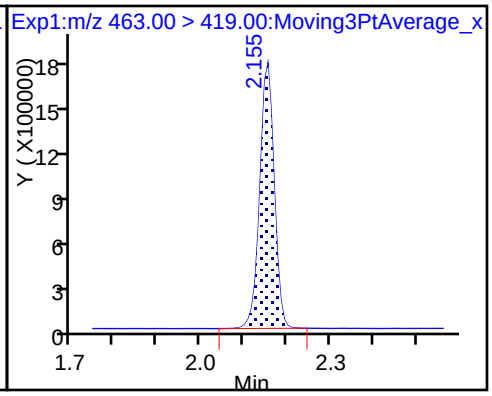
8 Perfluorooctane sulfonic acid



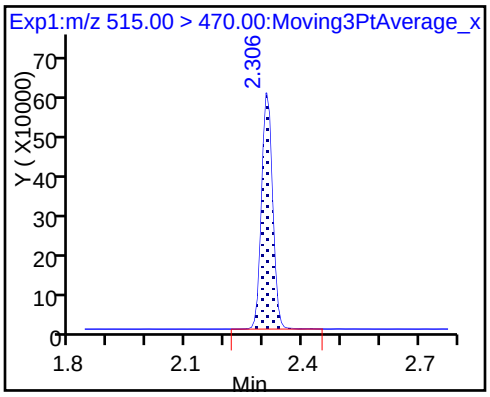
* 7 13C4 PFOS



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.: 320-35090-1

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

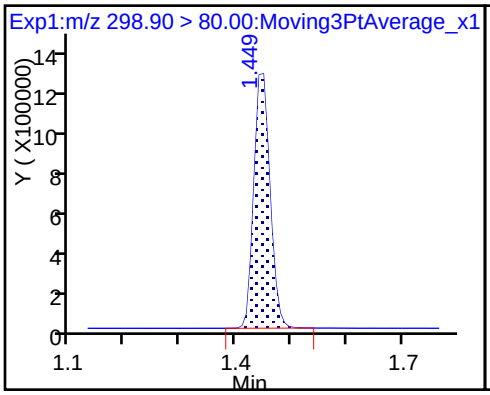
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 11

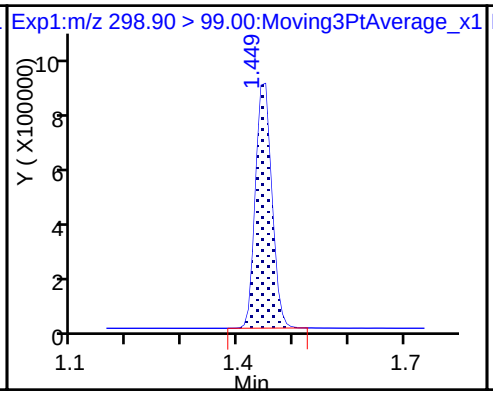
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

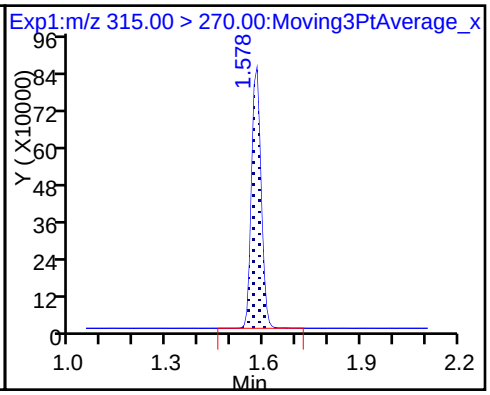
1 Perfluorobutanesulfonic acid



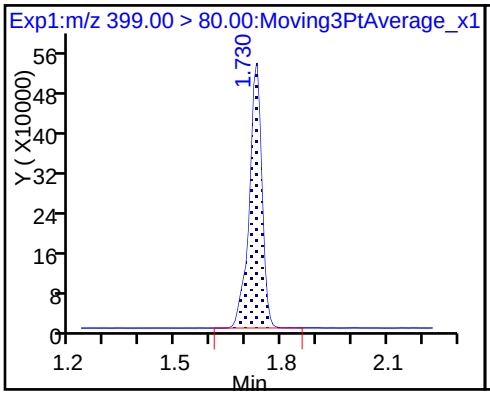
1 Perfluorobutanesulfonic acid



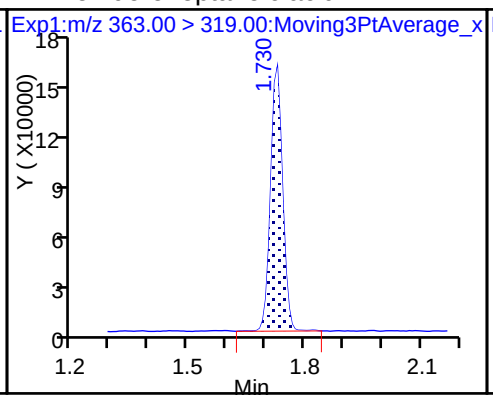
$ 2 13C2 PFHxA



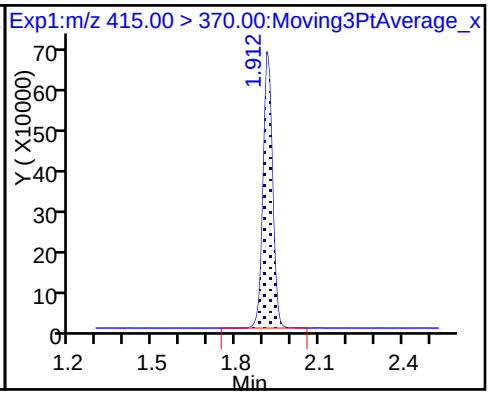
3 Perfluorohexanesulfonic acid



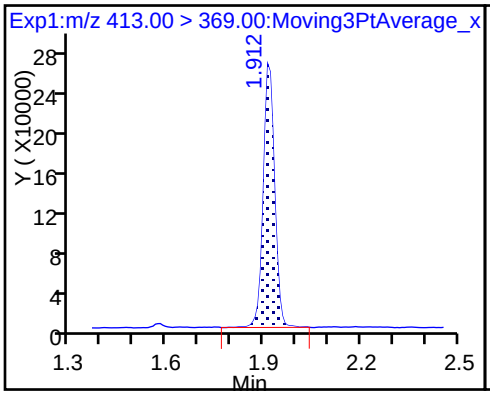
4 Perfluoroheptanoic acid



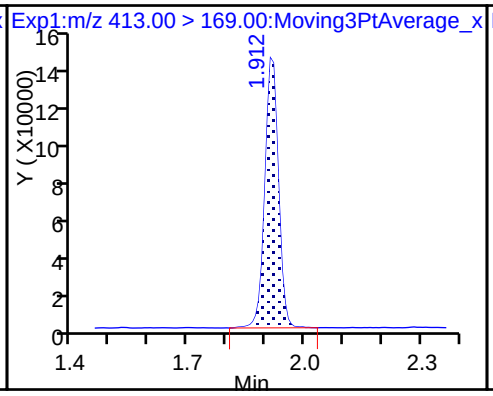
* 6 13C2-PFOA



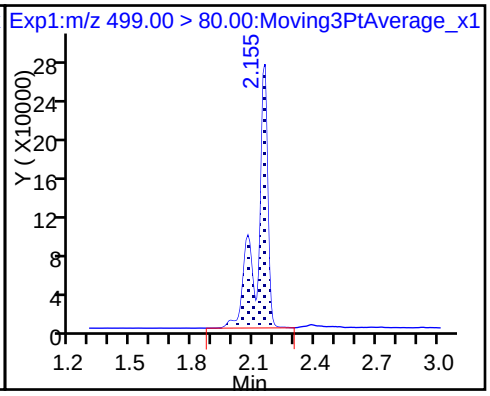
5 Perfluorooctanoic acid



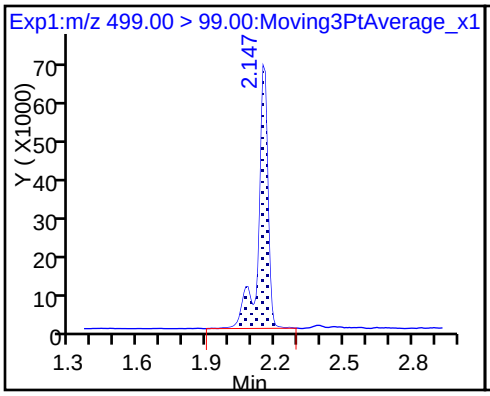
5 Perfluorooctanoic acid



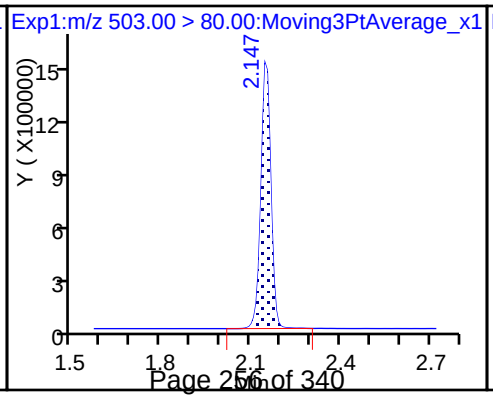
8 Perfluorooctane sulfonic acid



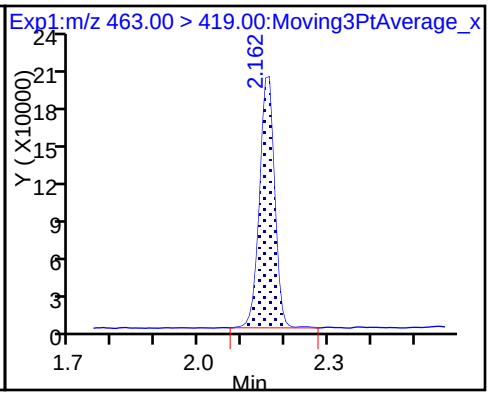
8 Perfluorooctane sulfonic acid



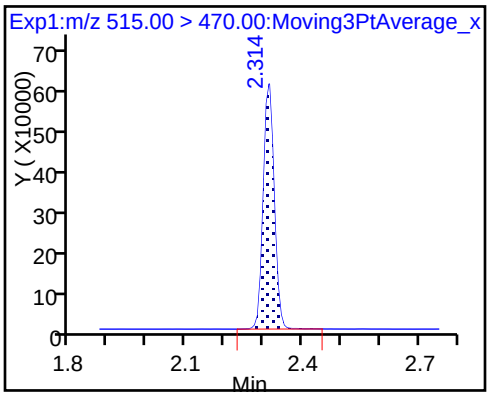
* 7 13C4 PFOS



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.: 320-35090-1

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

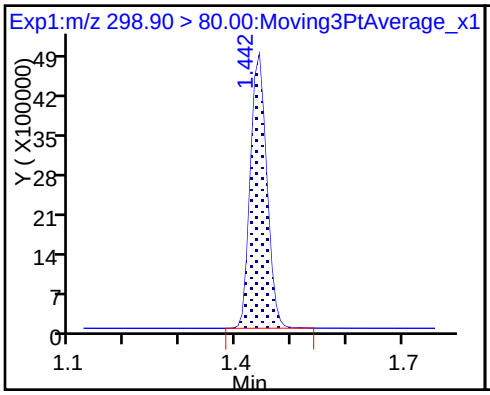
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 7 Worklist Smp#: 13

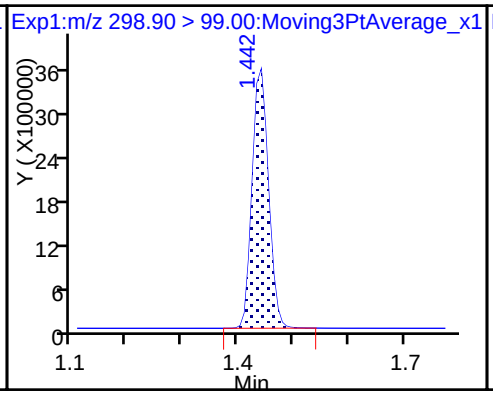
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

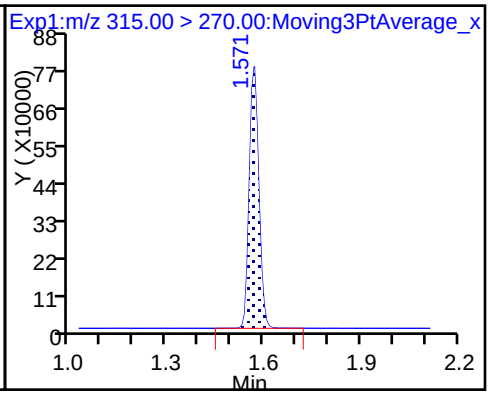
1 Perfluorobutanesulfonic acid



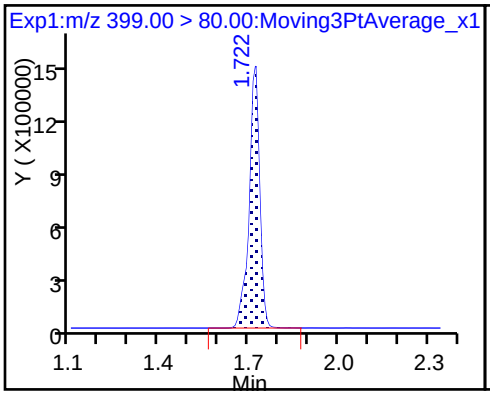
1 Perfluorobutanesulfonic acid



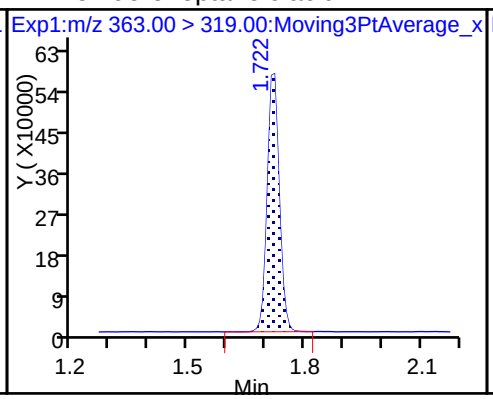
$ 2 13C2 PFHxA



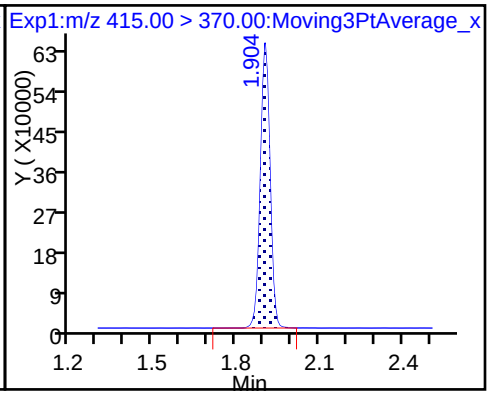
3 Perfluorohexanesulfonic acid



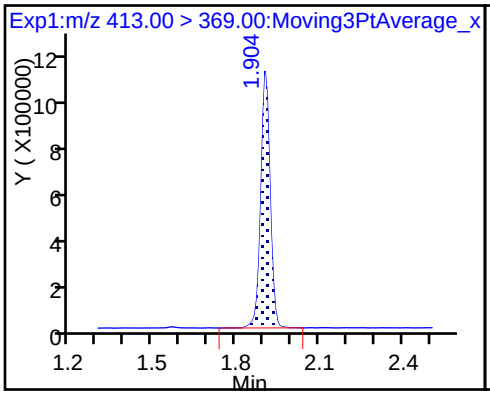
4 Perfluoroheptanoic acid



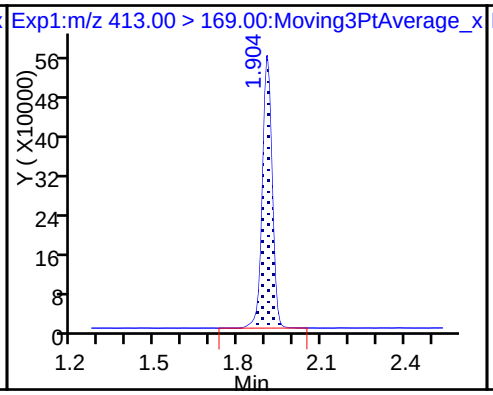
* 6 13C2-PFOA



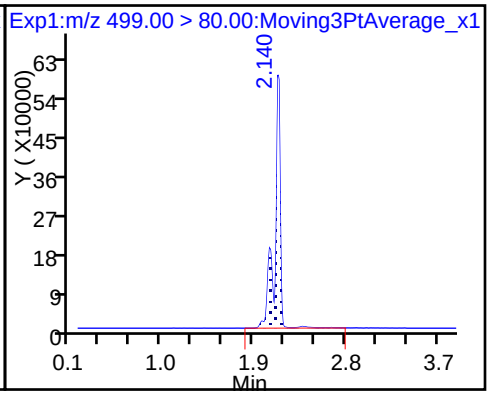
5 Perfluorooctanoic acid



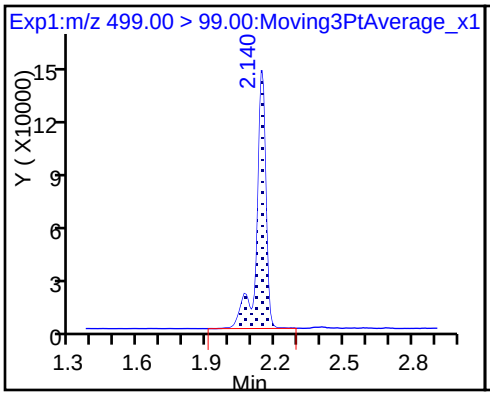
5 Perfluorooctanoic acid



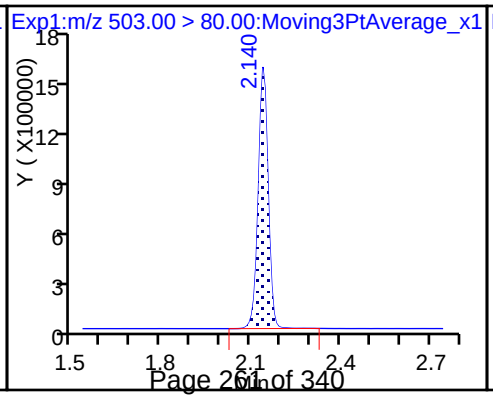
8 Perfluorooctane sulfonic acid



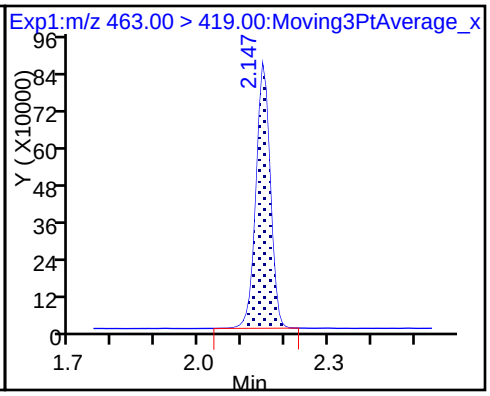
8 Perfluorooctane sulfonic acid



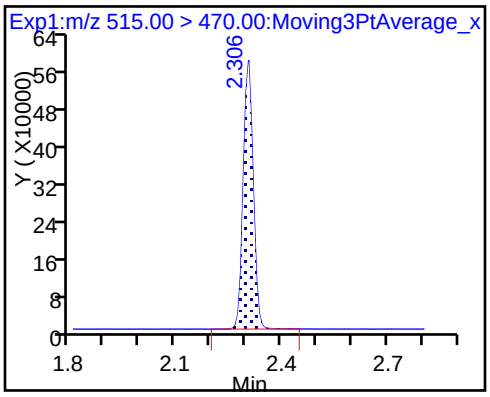
* 7 13C4 PFOS



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.: 320-35090-1

SDG No.:

Lab Sample ID: CCVL 320-206761/1 Calibration Date: 02/02/2018 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: 2018.02.02_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		1.107		20.3	20.0	1.7	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.8361		1.98	2.22	-10.8	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.674		6.67	6.67	-0.0	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9188		4.41	4.45	-0.8	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9385		8.89	8.89	-0.0	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.5870		3.93	4.45	-11.6	50.0
13C2 PFHxA	Ave	1.100	0.9771		8.88	10.0	-11.2	30.0
13C2 PFDA	Ave	0.7652	0.7354		9.61	10.0	-3.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_004.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 02-Feb-2018 14:10:10 ALS Bottle#: 2 Worklist Smp#: 1
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\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 05-Feb-2018 11:06:50 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: XAWRK004

First Level Reviewer: phomsophat Date: 02-Feb-2018 14:53:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	2524904	20.3		3981	
298.90 > 99.00	1.381	1.381	0.0	1.000	1803841		1.40(0.00-0.00)	3565	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.510	0.0	1.000	1617430	8.88		10816	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.662	1.662	0.0	1.000	1272250	6.67		2098	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.662	1.662	0.0	1.000	307633	1.98		107	
* 6 13C2-PFOA									
415.00 > 370.00	1.866	1.866	0.0		1655390	10.0		9120	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.866	1.866	0.0	1.000	676544	4.41		150	
413.00 > 169.00	1.866	1.866	0.0	1.000	367458		1.84(0.00-0.00)	1388	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.124	2.124	0.0	1.000	951235	8.89		1136	a
499.00 > 99.00	2.124	2.124	0.0	1.000	205297		4.63(0.00-0.00)	788	
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.124	0.0		3269547	28.7		8101	
9 Perfluorononanoic acid									
463.00 > 419.00	2.132	2.132	0.0	1.000	431982	3.93		140	
$ 10 13C2 PFDA									
515.00 > 470.00	2.284	2.284	0.0	1.000	1217329	9.61		8654	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

LC537-L2_00020 Amount Added: 1.00 Units: mL

Report Date: 05-Feb-2018 11:06:50 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_004.d

Injection Date: 02-Feb-2018 14:10:10 Instrument ID: A8_N

Lims ID: CCVL

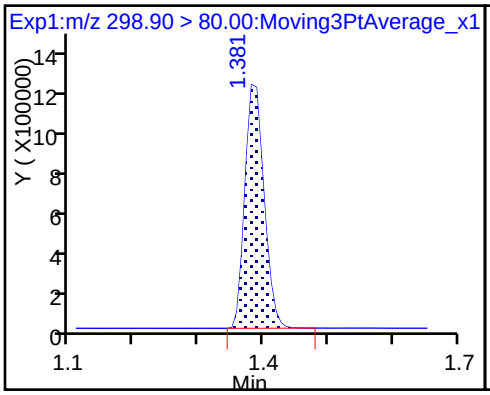
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 1

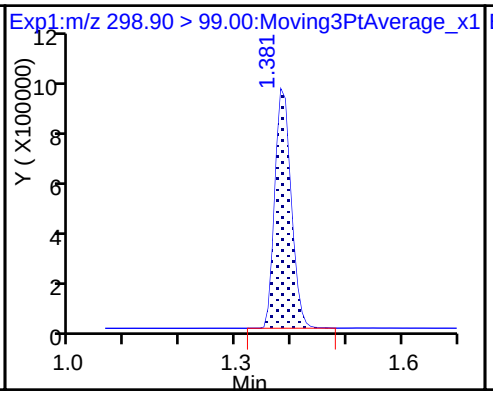
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

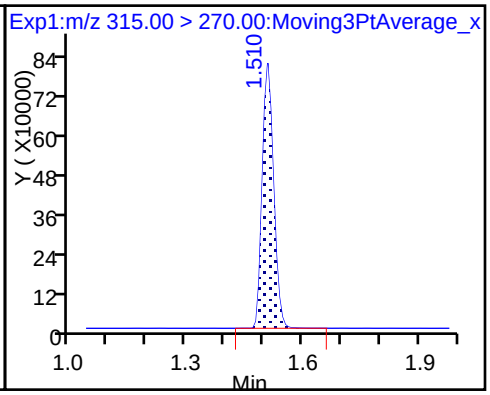
1 Perfluorobutanesulfonic acid



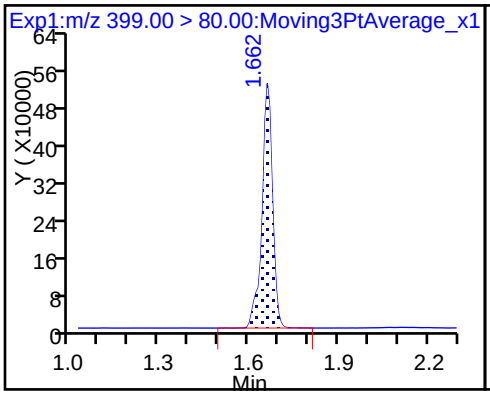
1 Perfluorobutanesulfonic acid



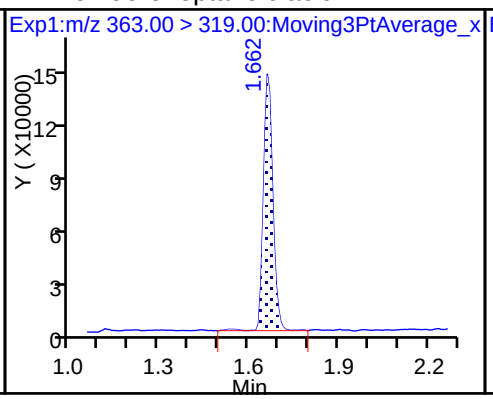
$ 2 13C2 PFHxA



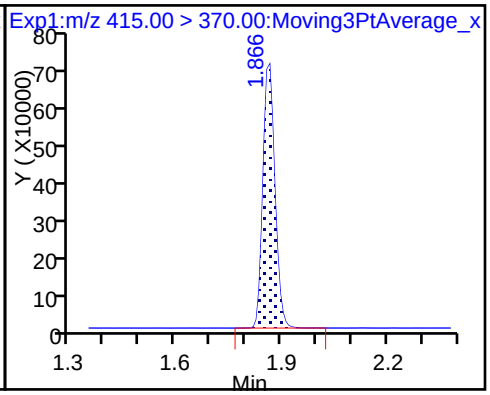
3 Perfluorohexanesulfonic acid



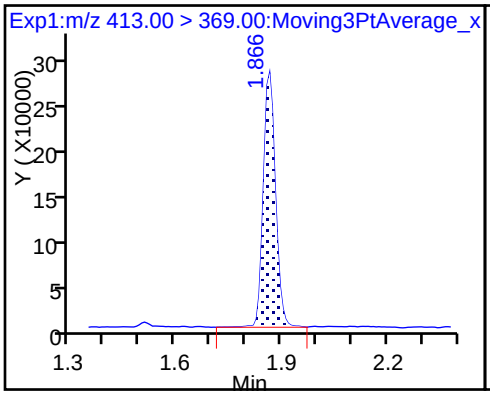
4 Perfluoroheptanoic acid



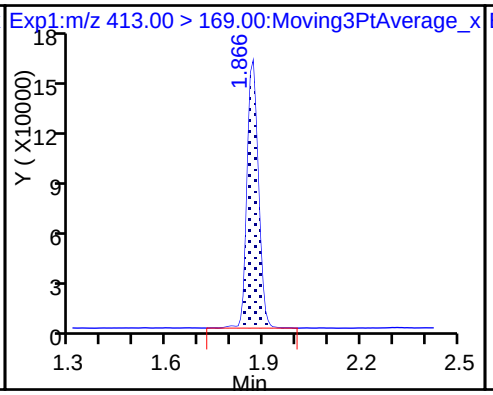
* 6 13C2-PFOA



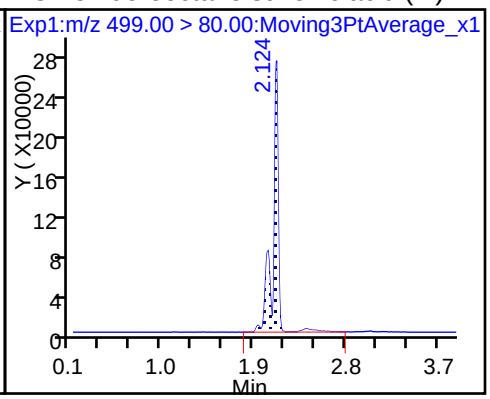
5 Perfluorooctanoic acid



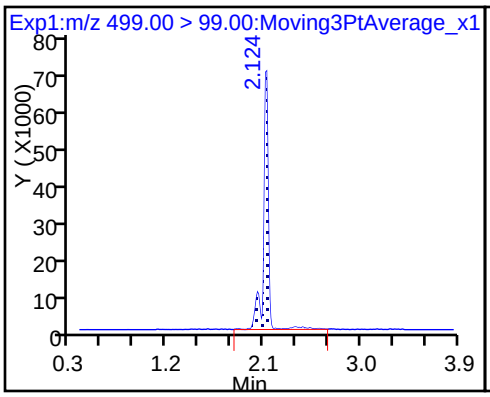
5 Perfluorooctanoic acid



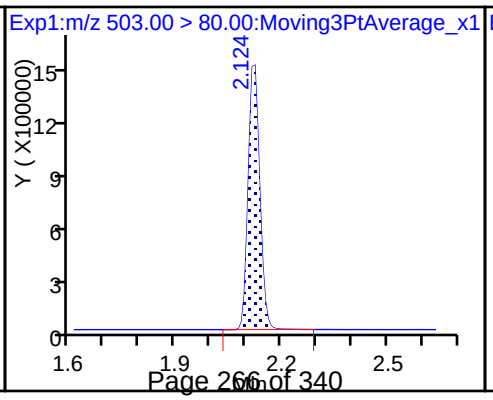
8 Perfluorooctane sulfonic acid (M)



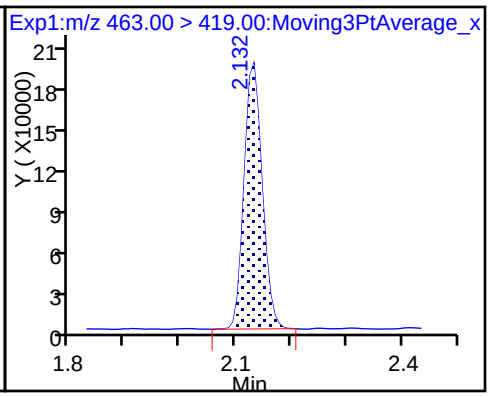
8 Perfluorooctane sulfonic acid



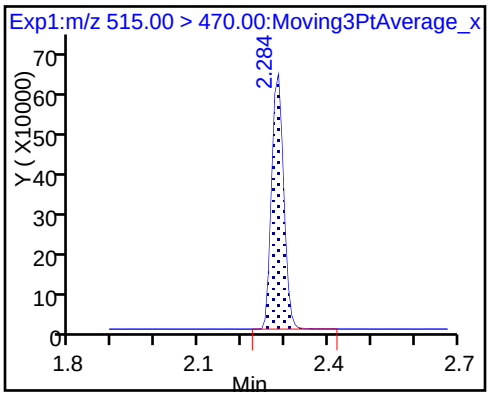
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.284
Y (X10000)
70
60
50
40
30
20
10
0
1.8
2.1
2.4
2.7
Min

TestAmerica Sacramento

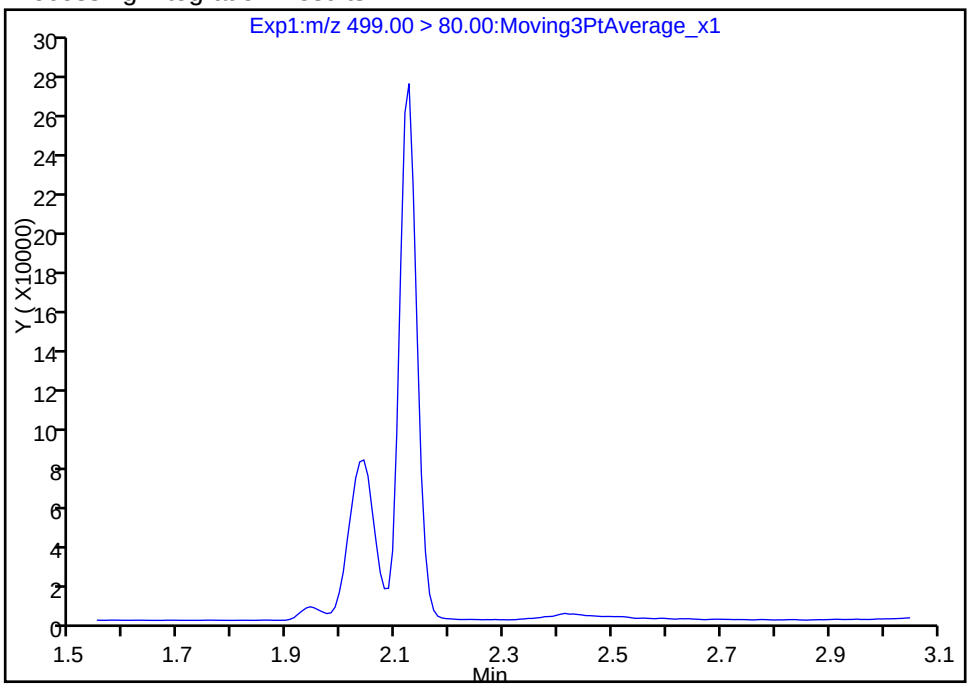
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_004.d
Injection Date: 02-Feb-2018 14:10:10 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

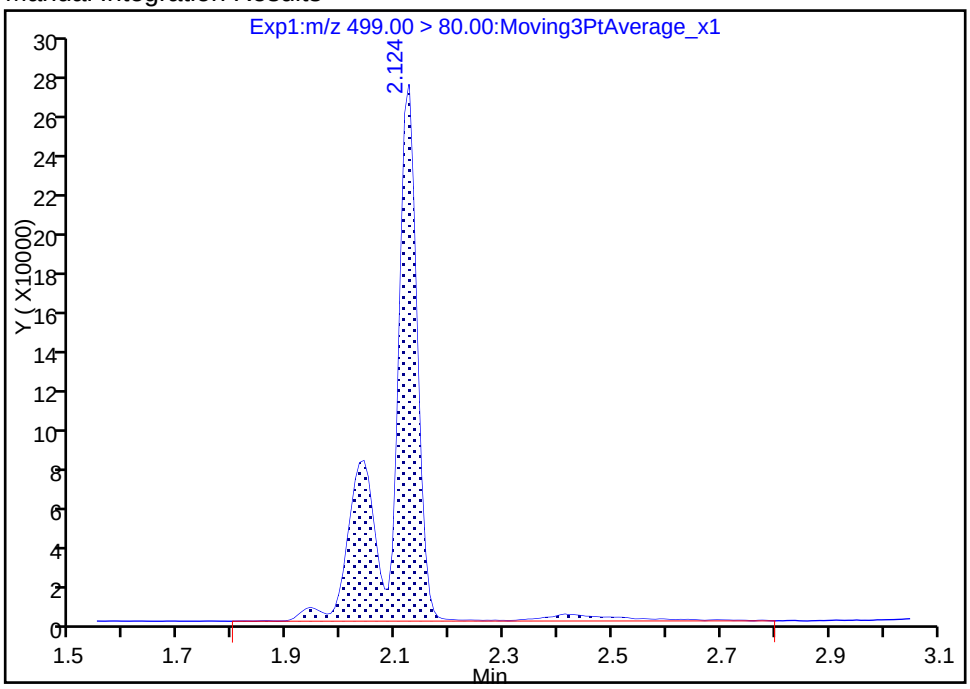
Processing Integration Results

Not Detected
Expected RT: 2.12



Manual Integration Results

RT: 2.12
Area: 951235
Amount: 8.886639
Amount Units: ng/ml



Reviewer: phomsophat, 02-Feb-2018 14:52:07
Audit Action: Assigned Compound ID Audit Reason: User Assigned

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Lab Sample ID: CCV 320-206761/2 Calibration Date: 02/02/2018 14:14

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: 2018.02.02_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		0.9248		136	135	1.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.8035		12.9	15.0	-14.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.651		44.4	45.0	-1.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9191		29.8	30.0	-0.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9295		59.4	60.0	-1.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6017		27.2	30.0	-9.4	30.0
13C2 PFHxA	Ave	1.100	0.9839		8.94	10.0	-10.6	30.0
13C2 PFDA	Ave	0.7652	0.7424		9.70	10.0	-3.0	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_005.d
Lims ID: CCV L5
Client ID:
Sample Type: CCVIS
Inject. Date: 02-Feb-2018 14:14:49 ALS Bottle#: 5 Worklist Smp#: 2
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\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:45:32 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:32:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	14066546	136.5		13079	
298.90 > 99.00	1.381	1.381	0.0	1.000	10803592		1.30(0.00-0.00)	13339	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.510	0.0	1.000	1629835	8.94		9966	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.662	1.662	0.0	1.000	8371869	44.4		9841	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.662	1.662	0.0	1.000	1997028	12.9		691	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.859	0.0		1656526	10.0		7618	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.859	0.0	1.000	4571422	29.8		968	
413.00 > 169.00	1.859	1.859	0.0	1.000	2524546		1.81(0.00-0.00)	8383	
* 7 13C4 PFOS									
503.00 > 80.00	2.117	2.117	0.0		3231012	28.7		8044	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.117	2.124	-0.007	1.000	6284377	59.4		2867	M
499.00 > 99.00	2.117	2.124	-0.007	1.000	1339576		4.69(0.00-0.00)	2650	M
9 Perfluorononanoic acid									
463.00 > 419.00	2.124	2.124	0.0	1.000	2990609	27.2		961	
$ 10 13C2 PFDA									
515.00 > 470.00	2.284	2.284	0.0	1.000	1229725	9.70		8432	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L5_00024 Amount Added: 1.00 Units: mL

Report Date: 06-Feb-2018 13:45:33 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_005.d

Injection Date: 02-Feb-2018 14:14:49 Instrument ID: A8_N

Lims ID: CCV L5

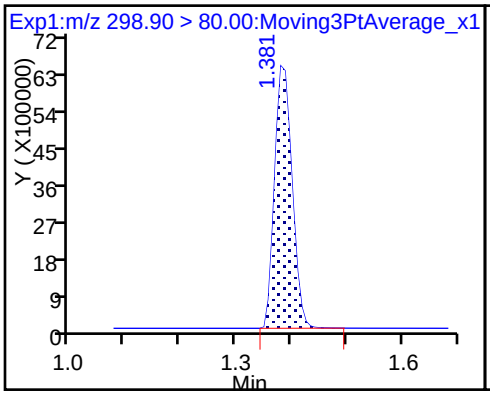
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 2

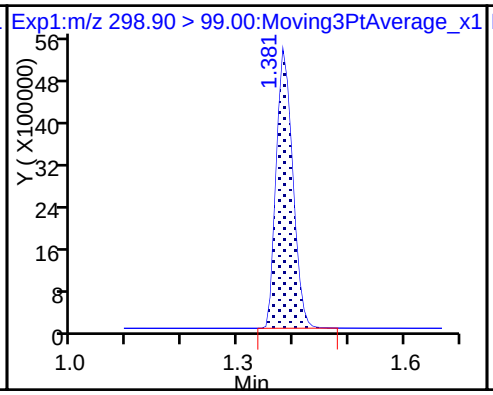
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

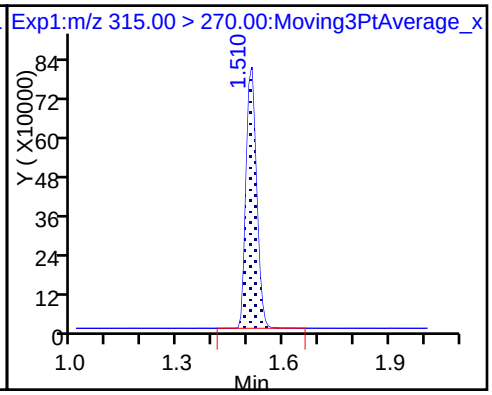
1 Perfluorobutanesulfonic acid



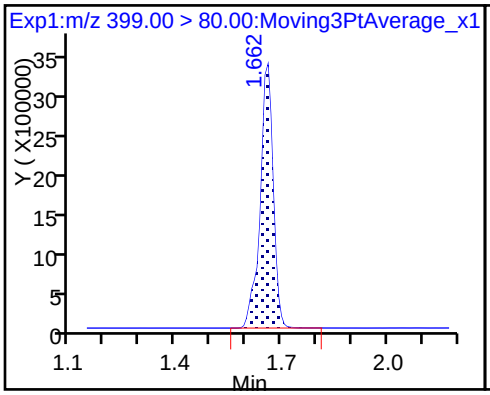
1 Perfluorobutanesulfonic acid



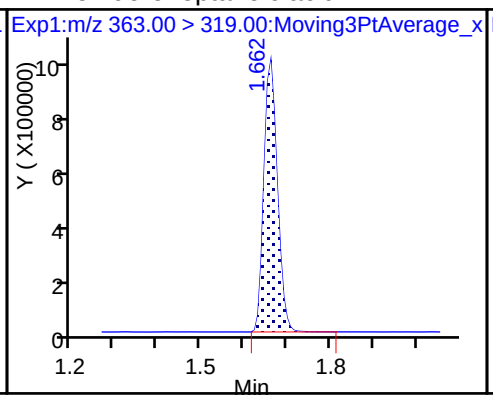
$ 2 13C2 PFHxA



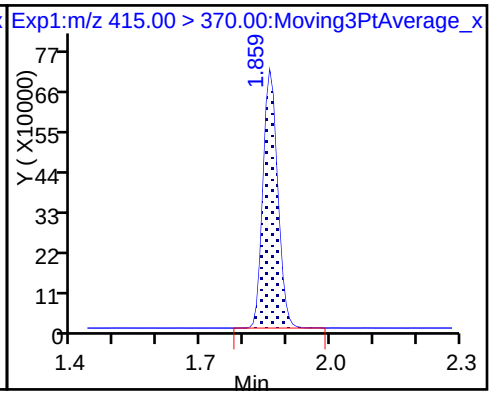
3 Perfluorohexanesulfonic acid



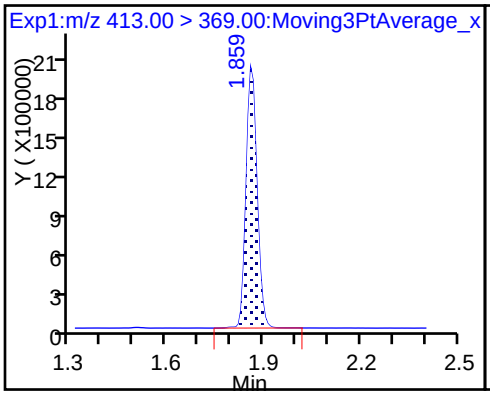
4 Perfluoroheptanoic acid



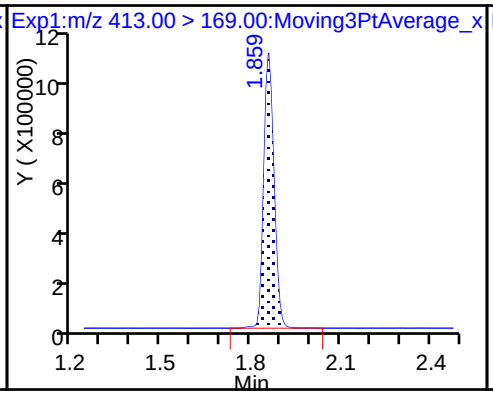
* 6 13C2-PFOA



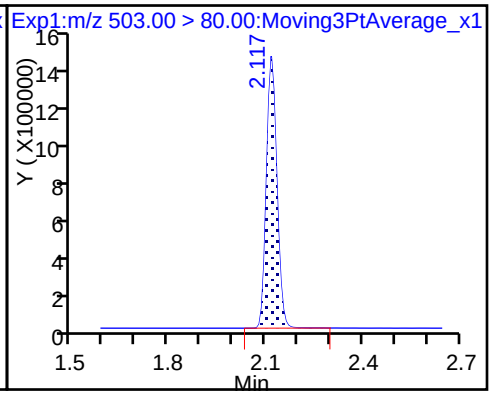
5 Perfluorooctanoic acid



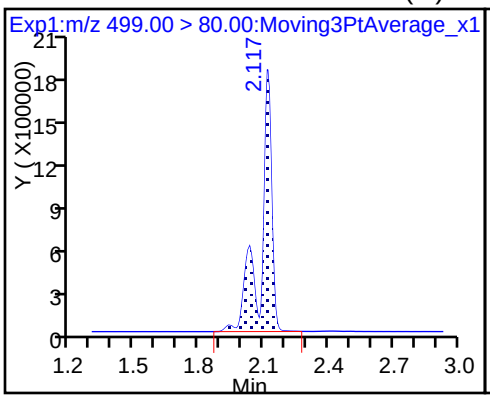
5 Perfluorooctanoic acid



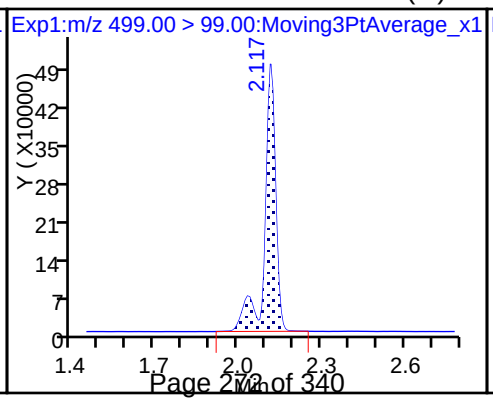
* 7 13C4 PFOS



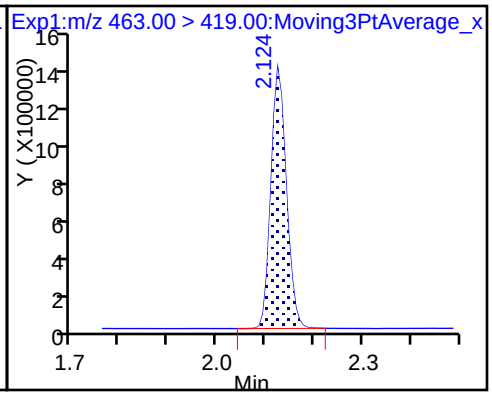
8 Perfluorooctane sulfonic acid (M)



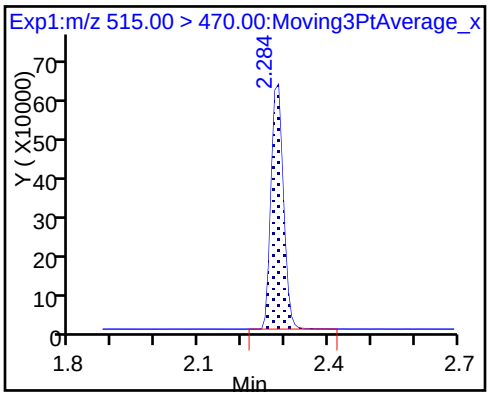
8 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.284
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

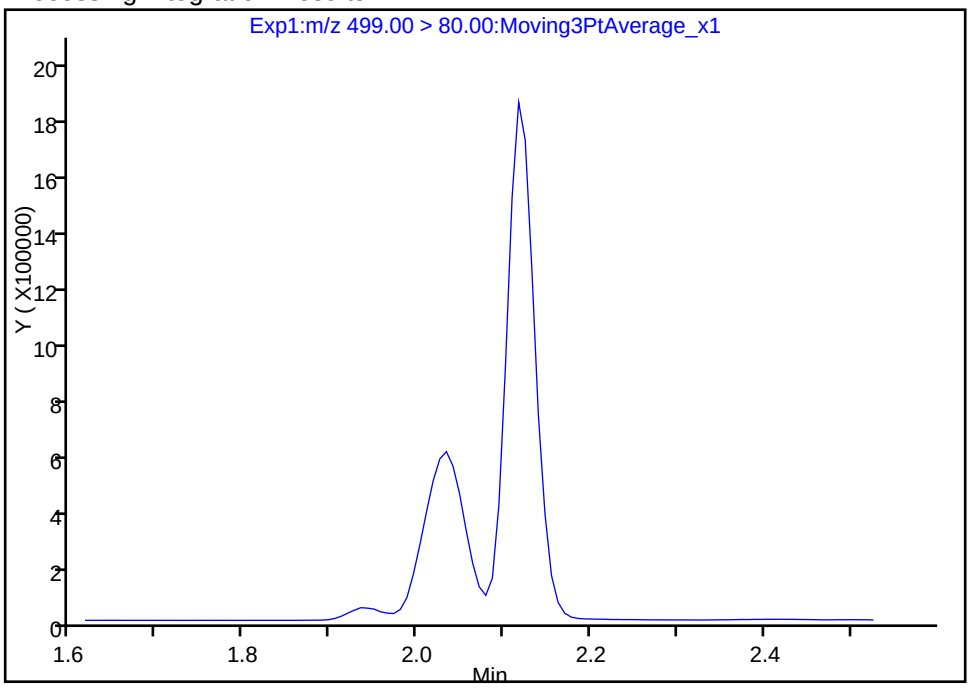
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_005.d
Injection Date: 02-Feb-2018 14:14:49 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

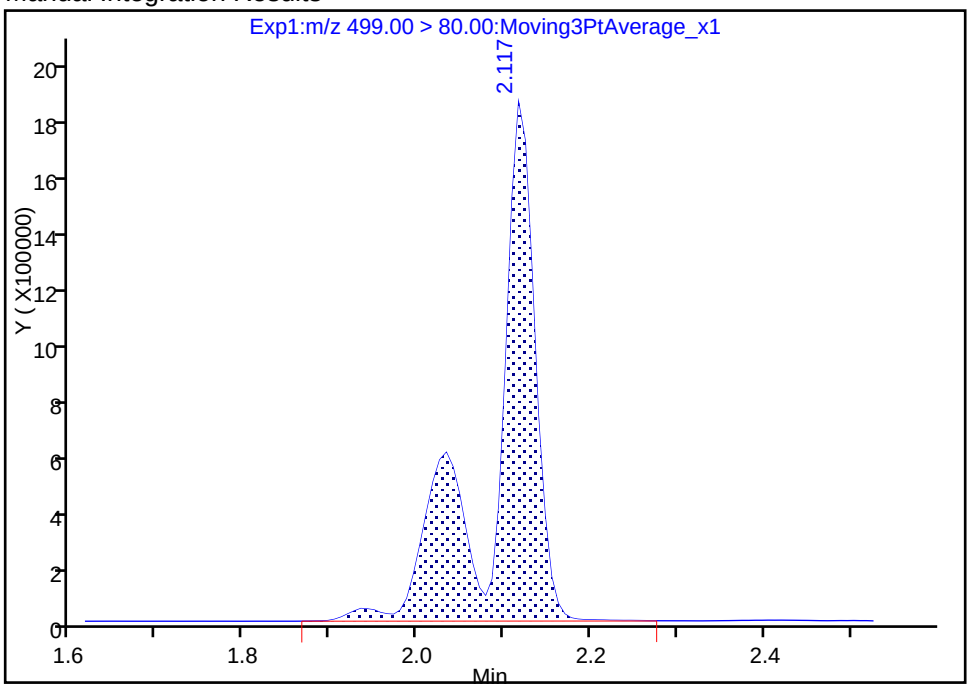
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 6284377
Amount: 59.410190
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:25:30
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

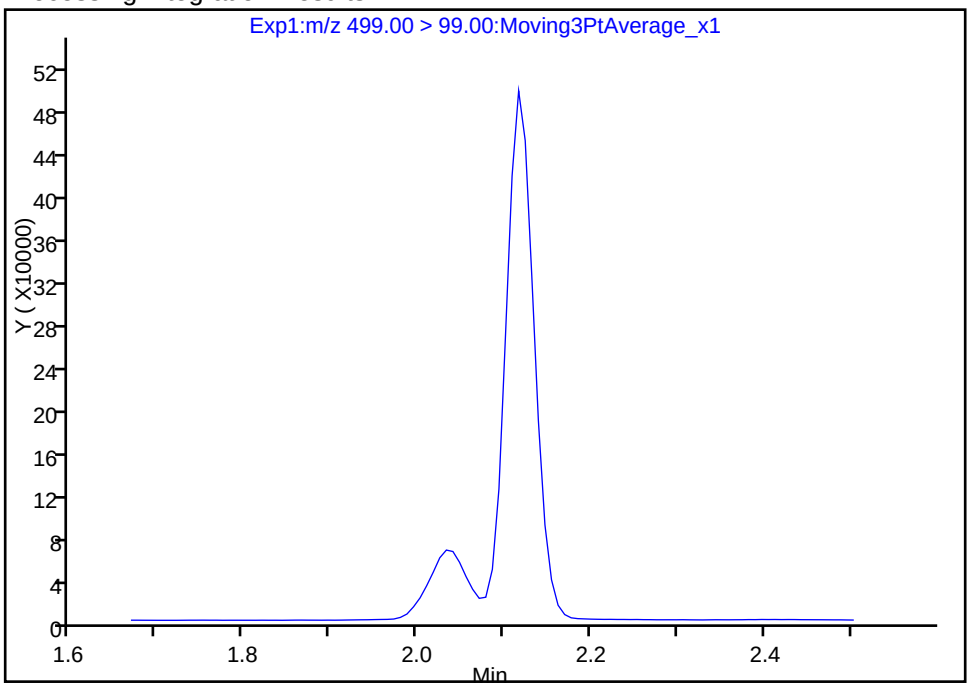
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_005.d
Injection Date: 02-Feb-2018 14:14:49 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

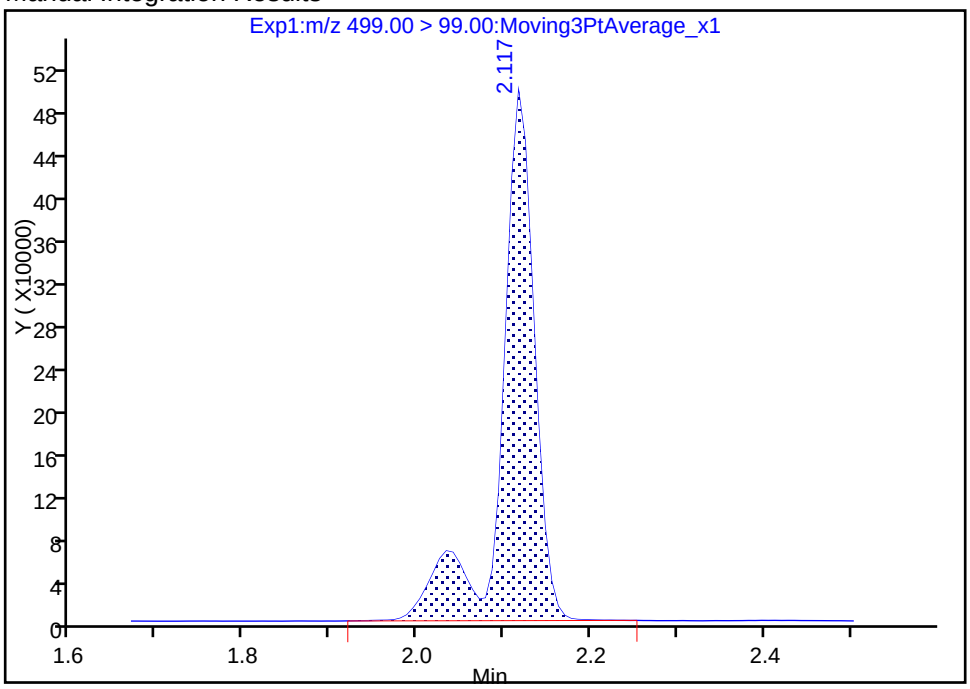
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 1339576
Amount: 59.410190
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:25:42
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Lab Sample ID: CCV 320-206761/14 Calibration Date: 02/02/2018 15:10

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: 2018.02.02_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		1.076		46.1	45.0	2.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.8627		4.60	5.00	-7.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.659		14.9	15.0	-0.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8783		9.49	10.0	-5.1	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.8799		18.7	20.0	-6.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.5963		8.98	10.0	-10.2	30.0
13C2 PFHxA	Ave	1.100	1.054		9.58	10.0	-4.2	30.0
13C2 PFDA	Ave	0.7652	0.7349		9.60	10.0	-4.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Lab Sample ID: CCV 320-206762/14 Calibration Date: 02/02/2018 15:10

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: 2018.02.02_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		1.076		46.1	45.0	2.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.8627		4.60	5.00	-7.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.659		14.9	15.0	-0.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8783		9.49	10.0	-5.1	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.8799		18.7	20.0	-6.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.5963		8.98	10.0	-10.2	30.0
13C2 PFHxA	Ave	1.100	1.054		9.58	10.0	-4.2	30.0
13C2 PFDA	Ave	0.7652	0.7349		9.60	10.0	-4.0	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_017.d
Lims ID: CCV L3
Client ID:
Sample Type: CCVIS
Inject. Date: 02-Feb-2018 15:10:54 ALS Bottle#: 3 Worklist Smp#: 14
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\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:47:08 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:38:26

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	5400074	46.1		8474	
298.90 > 99.00	1.381	1.381	0.0	1.000	4102932		1.32(0.00-0.00)	7050	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1637561	9.58		9089	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.646	1.646	0.0	1.000	2776543	14.9		4083	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.646	1.646	0.0	1.000	670210	4.60		221	
* 6 13C2-PFOA									
415.00 > 370.00	1.844	1.844	0.0		1553440	10.0		6832	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.844	1.844	0.0	1.000	1365478	9.49		244	
413.00 > 169.00	1.844	1.844	0.0	1.000	754903		1.81(0.00-0.00)	3014	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.094	0.0		3198528	28.7		6912	
9 Perfluorononanoic acid									
463.00 > 419.00	2.102	2.102	0.0	1.000	926506	8.98		272	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.094	2.124	-0.030	1.000	1963058	18.7		1120	M
499.00 > 99.00	2.094	2.124	-0.030	1.000	420333		4.67(0.00-0.00)	873	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1141616	9.60		8046	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00023 Amount Added: 1.00 Units: mL

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_017.d
Lims ID: CCV L3
Client ID:
Sample Type: CCVIS
Inject. Date: 02-Feb-2018 15:10:54 ALS Bottle#: 3 Worklist Smp#: 14
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\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:47:08 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:38:26

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	5400074	46.1		8474	
298.90 > 99.00	1.381	1.381	0.0	1.000	4102932		1.32(0.00-0.00)	7050	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1637561	9.58		9089	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.646	1.646	0.0	1.000	2776543	14.9		4083	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.646	1.646	0.0	1.000	670210	4.60		221	
* 6 13C2-PFOA									
415.00 > 370.00	1.844	1.844	0.0		1553440	10.0		6832	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.844	1.844	0.0	1.000	1365478	9.49		244	
413.00 > 169.00	1.844	1.844	0.0	1.000	754903		1.81(0.00-0.00)	3014	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.094	0.0		3198528	28.7		6912	
9 Perfluorononanoic acid									
463.00 > 419.00	2.102	2.102	0.0	1.000	926506	8.98		272	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.094	2.124	-0.030	1.000	1963058	18.7		1120	M
499.00 > 99.00	2.094	2.124	-0.030	1.000	420333		4.67(0.00-0.00)	873	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1141616	9.60		8046	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00023 Amount Added: 1.00 Units: mL

Report Date: 06-Feb-2018 13:47:08 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_017.d

Injection Date: 02-Feb-2018 15:10:54 Instrument ID: A8_N

Lims ID: CCV L3

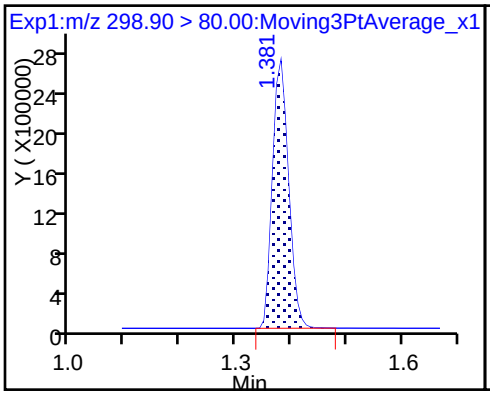
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 14

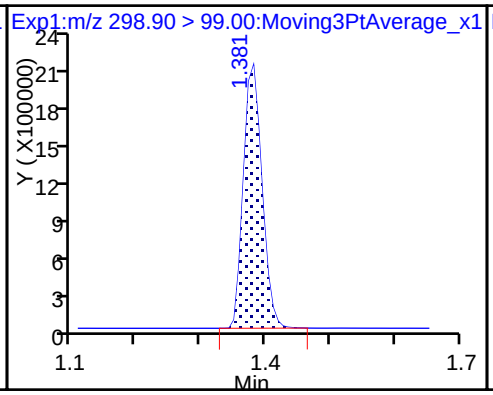
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

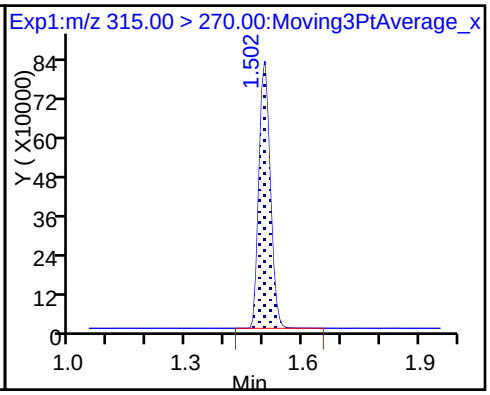
1 Perfluorobutanesulfonic acid



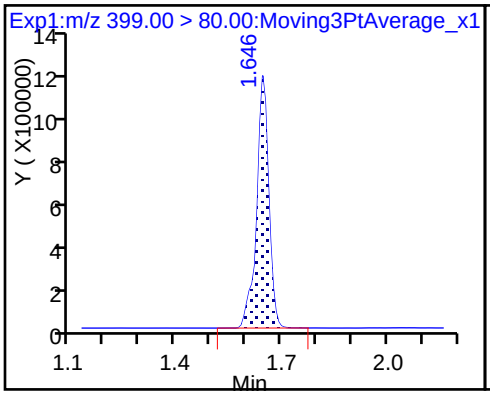
1 Perfluorobutanesulfonic acid



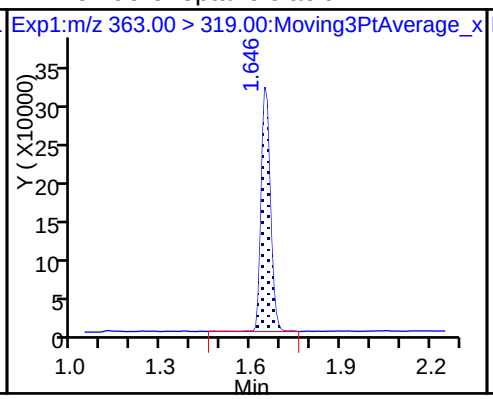
$ 2 13C2 PFHxA



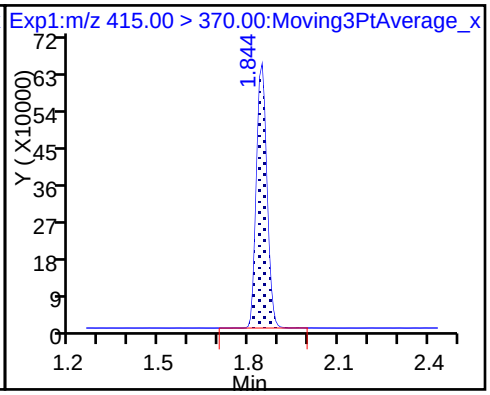
3 Perfluorohexanesulfonic acid



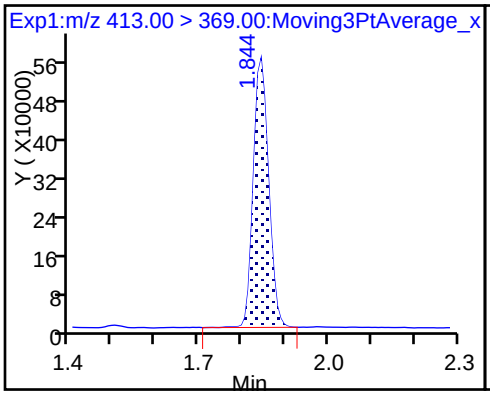
4 Perfluoroheptanoic acid



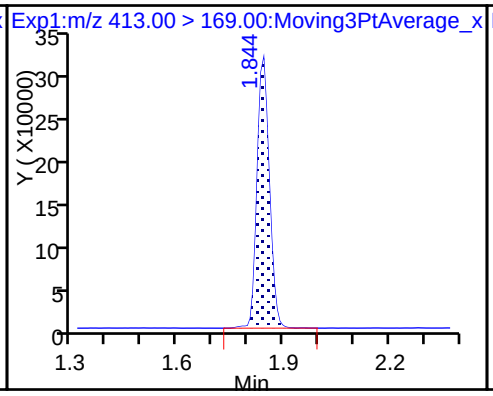
* 6 13C2-PFOA



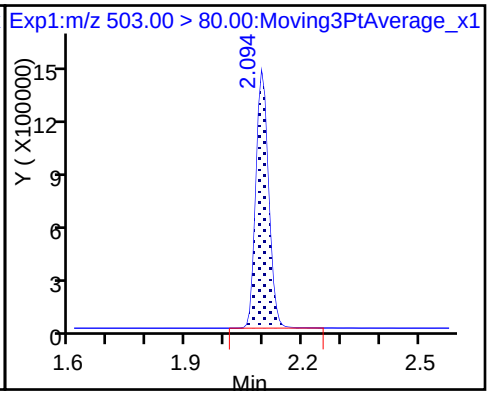
5 Perfluorooctanoic acid



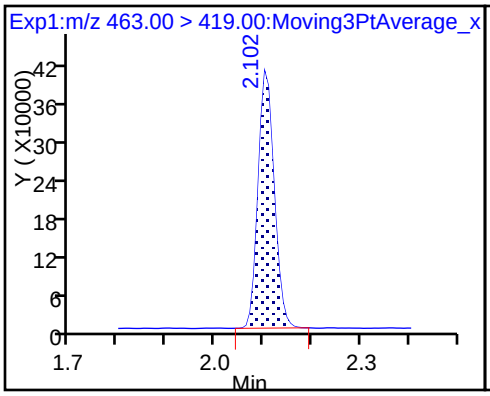
5 Perfluorooctanoic acid



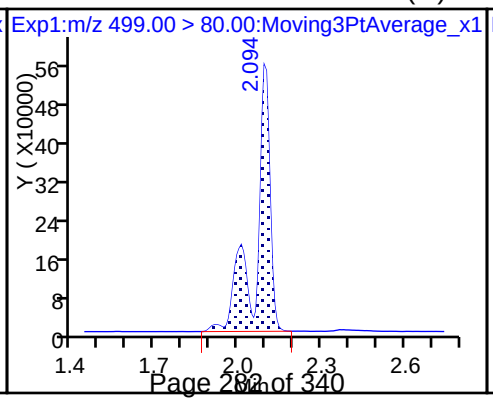
* 7 13C4 PFOS



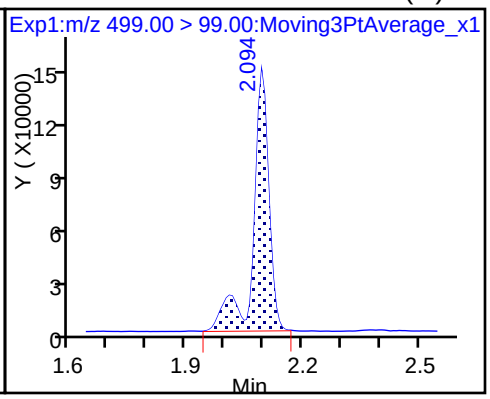
9 Perfluorononanoic acid



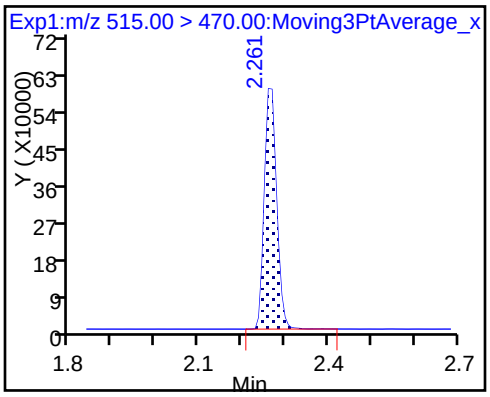
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.261
Y (X10000)
72
63
54
45
36
27
18
9
0
1.8
2.1
2.4
2.7
Min

Report Date: 06-Feb-2018 13:47:09 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_017.d

Injection Date: 02-Feb-2018 15:10:54 Instrument ID: A8_N

Lims ID: CCV L3

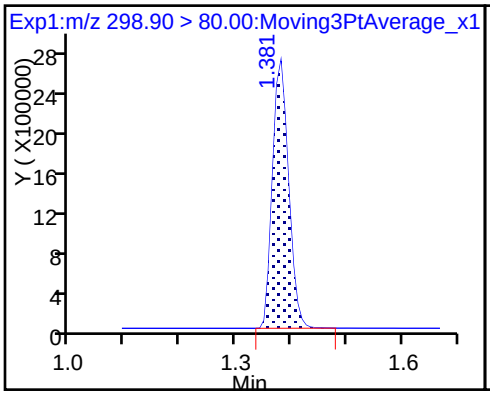
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 14

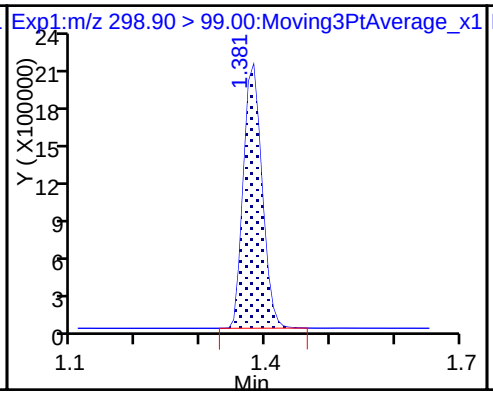
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

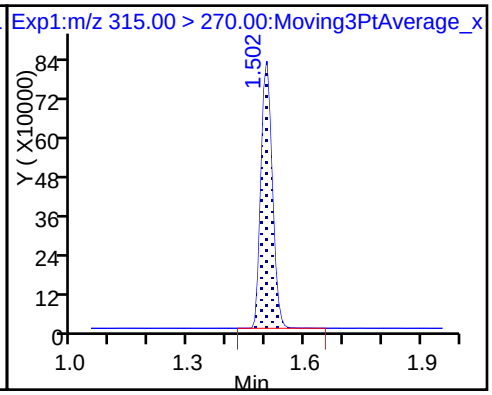
1 Perfluorobutanesulfonic acid



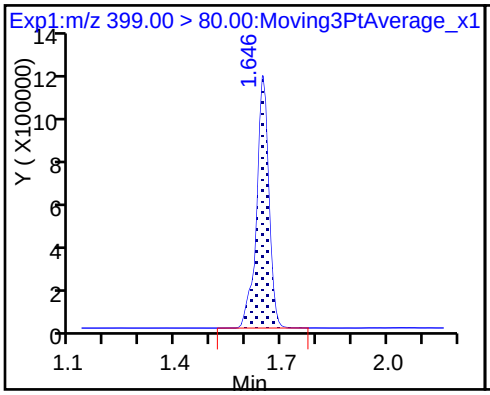
1 Perfluorobutanesulfonic acid



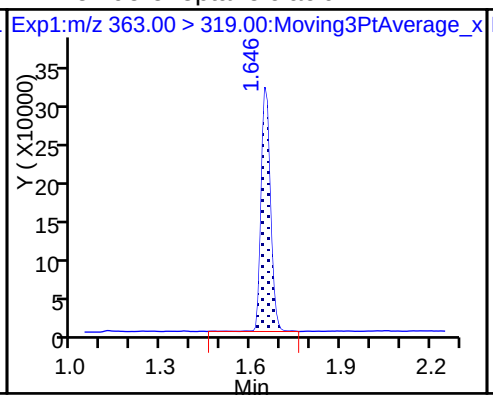
$ 2 13C2 PFHxA



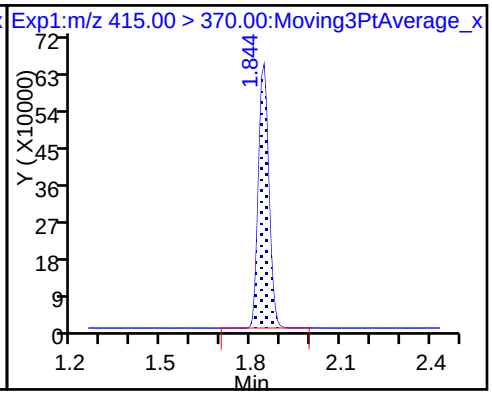
3 Perfluorohexanesulfonic acid



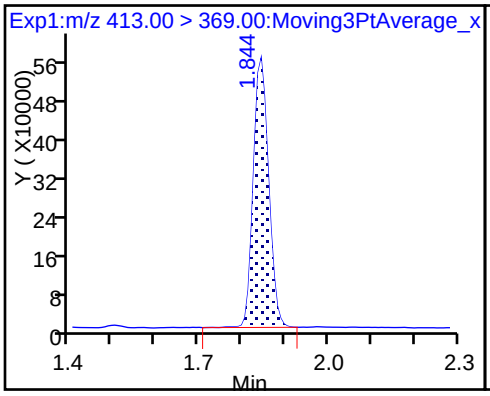
4 Perfluoroheptanoic acid



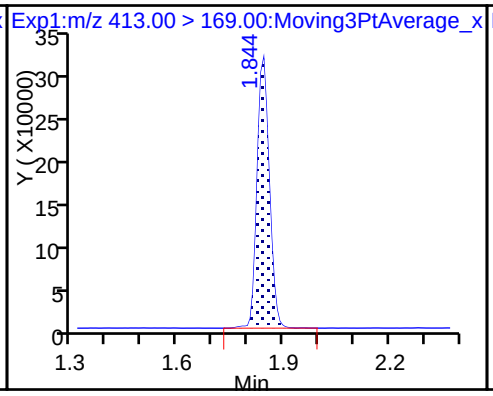
* 6 13C2-PFOA



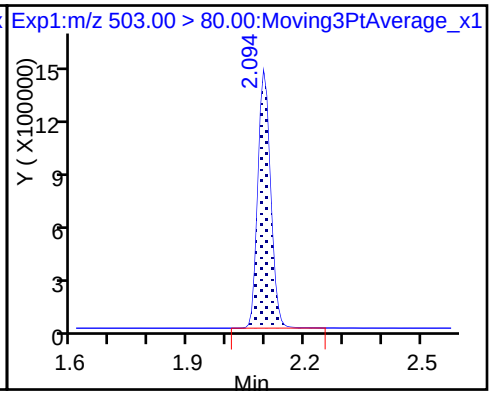
5 Perfluorooctanoic acid



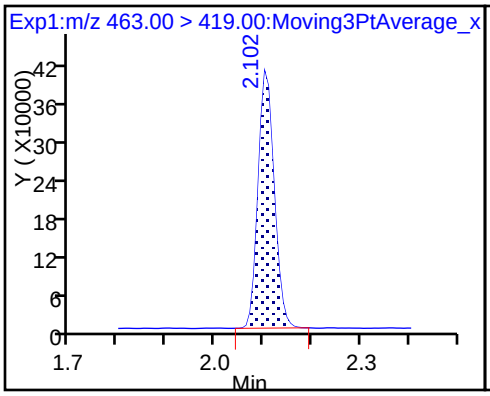
5 Perfluorooctanoic acid



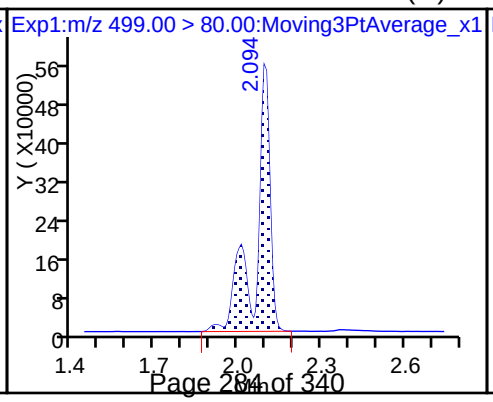
* 7 13C4 PFOS



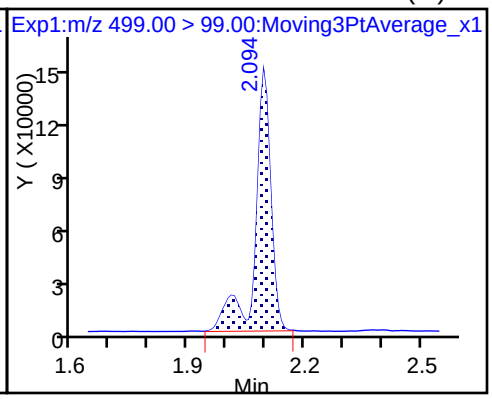
9 Perfluorononanoic acid



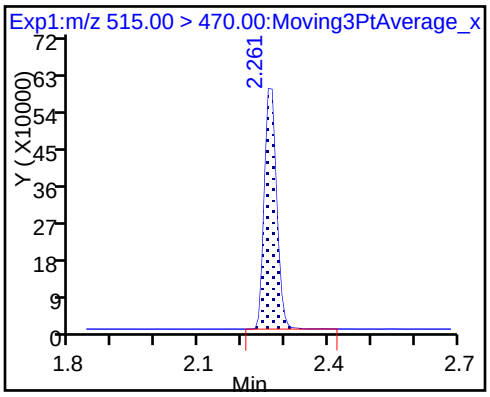
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.261
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

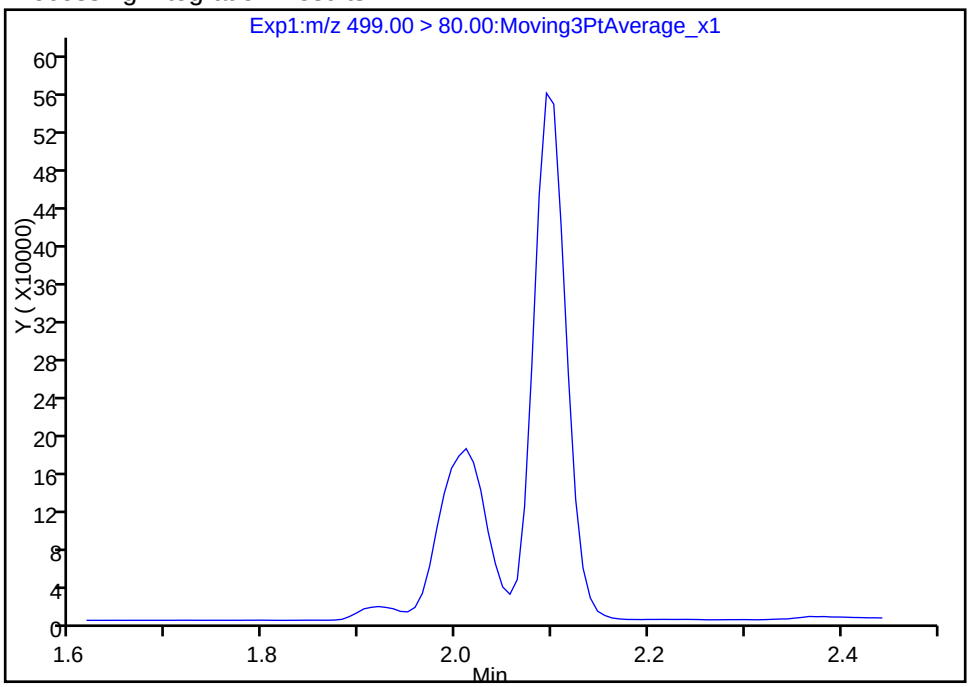
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_017.d
Injection Date: 02-Feb-2018 15:10:54 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

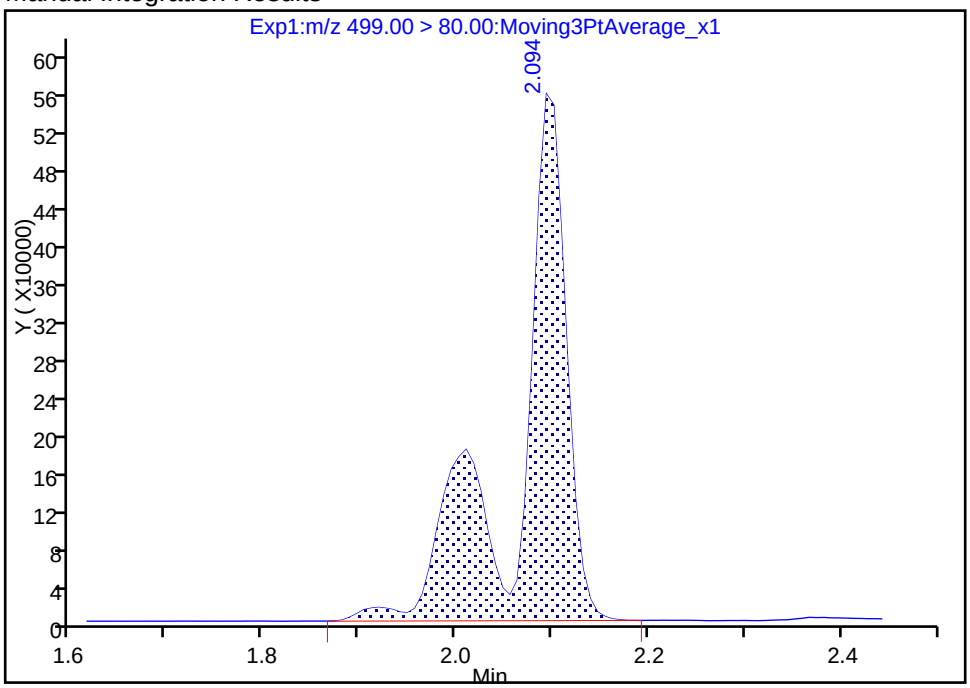
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.09
Area: 1963058
Amount: 18.746503
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:38:02
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

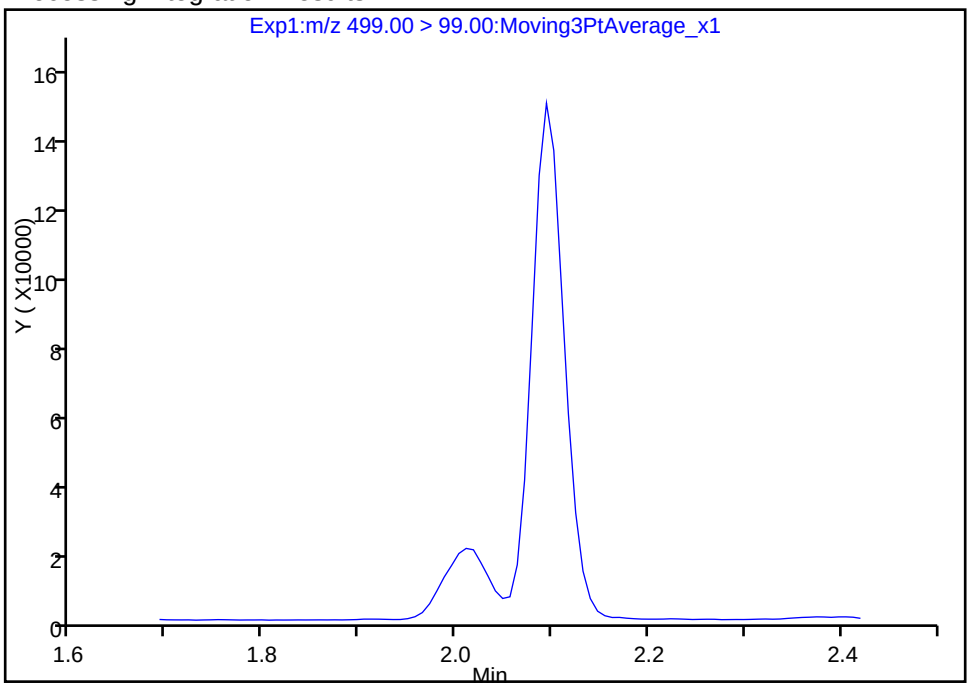
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_017.d				
Injection Date:	02-Feb-2018 15:10:54	Instrument ID:	A8_N		
Lims ID:	CCV L3				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	3	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 2

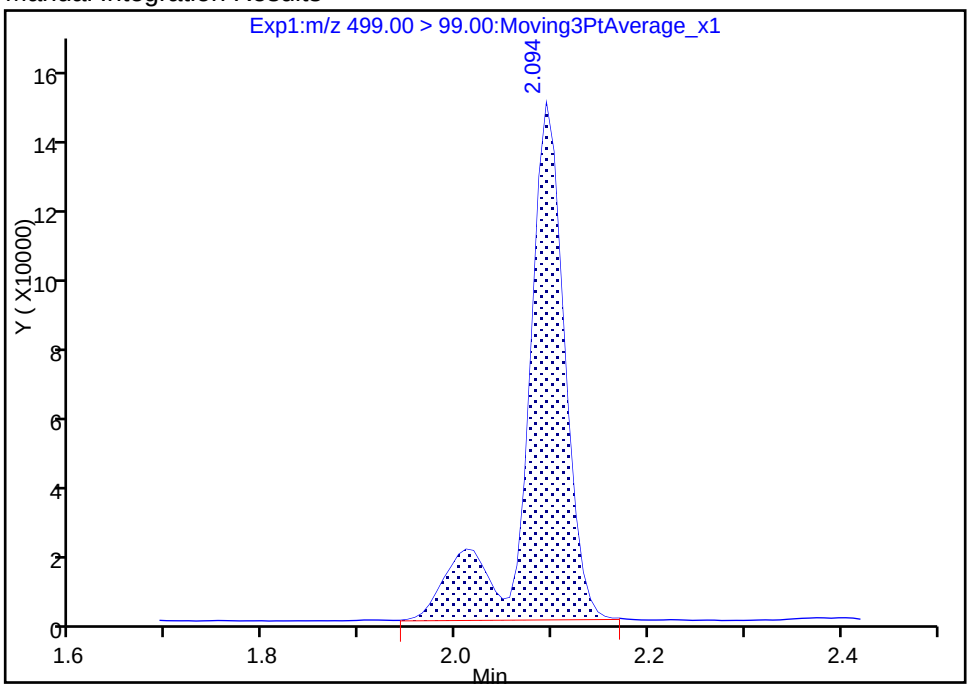
Processing Integration Results

Not Detected
Expected RT: 2.12



Manual Integration Results

RT: 2.09
Area: 420333
Amount: 18.746503
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:38:06
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

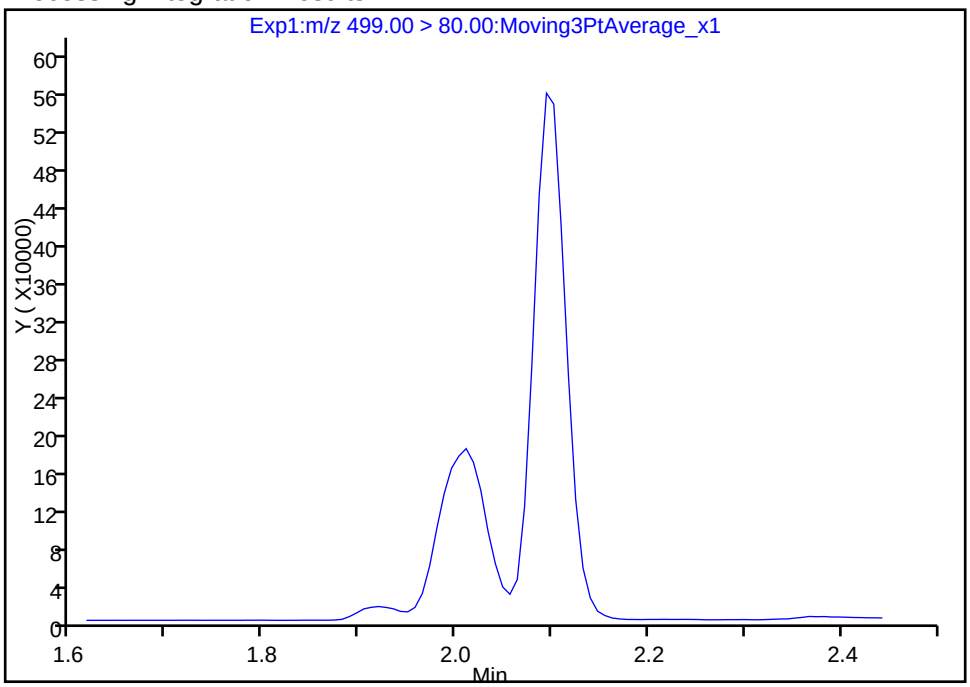
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_017.d
Injection Date: 02-Feb-2018 15:10:54 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

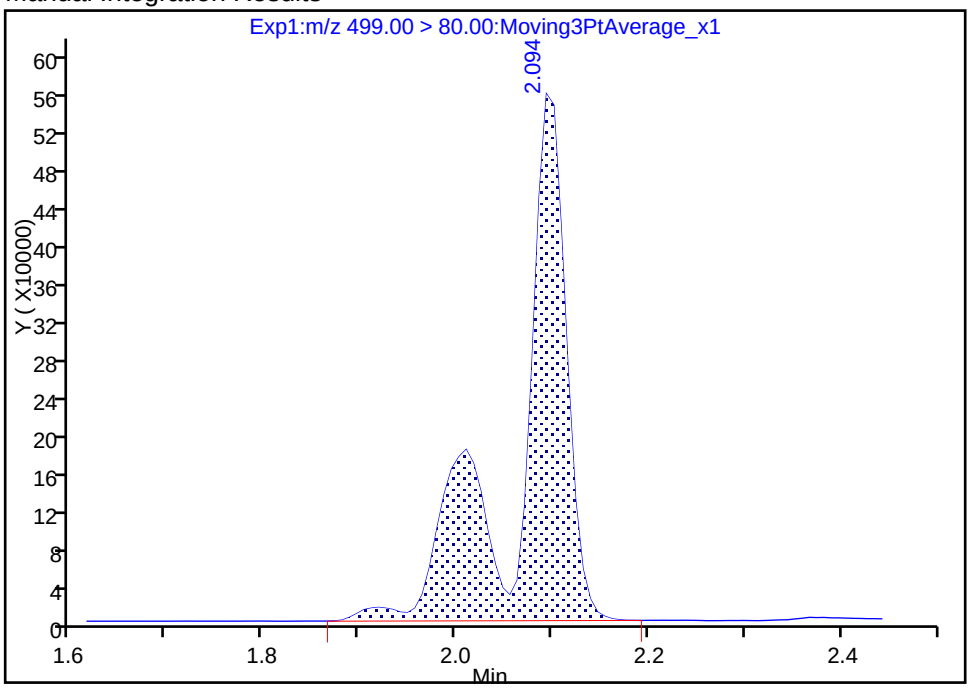
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.09
Area: 1963058
Amount: 18.746503
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:38:02
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

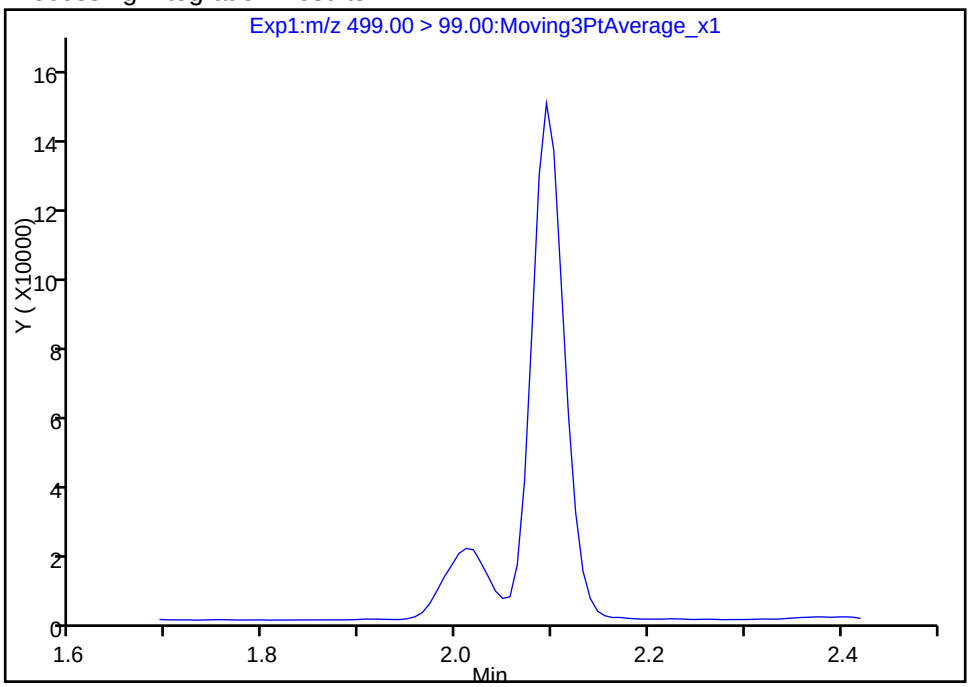
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_017.d				
Injection Date:	02-Feb-2018 15:10:54	Instrument ID:	A8_N		
Lims ID:	CCV L3				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	3	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 2

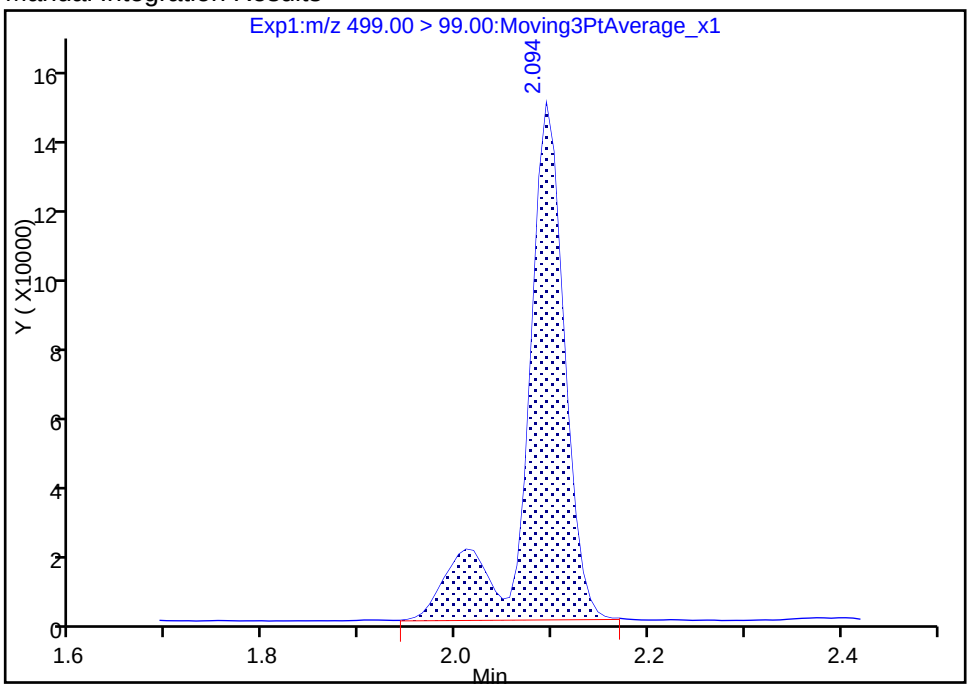
Processing Integration Results

Not Detected
Expected RT: 2.12



Manual Integration Results

RT: 2.09
Area: 420333
Amount: 18.746503
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:38:06
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Lab Sample ID: CCV 320-206762/26 Calibration Date: 02/02/2018 16:07

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: 2018.02.02_537A_029.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.9496		141	135	4.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9328		14.9	15.0	-0.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.719		46.2	45.0	2.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9519		30.9	30.0	2.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9365		59.9	60.0	-0.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6257		28.3	30.0	-5.8	30.0
13C2 PFHxA	Ave	1.100	1.137		10.3	10.0	3.4	30.0
13C2 PFDA	Ave	0.7652	0.7804		10.2	10.0	2.0	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_029.d
Lims ID: CCV L5
Client ID:
Sample Type: CCVIS
Inject. Date: 02-Feb-2018 16:07:03 ALS Bottle#: 5 Worklist Smp#: 26
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\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:49:56 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:49:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.373	0.0	1.000	13870180	141.2		14146	
298.90 > 99.00	1.373	1.373	0.0	1.000	10609646		1.31(0.00-0.00)	12008	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.495	0.0	1.000	1663191	10.3		9372	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.639	1.639	0.0	1.000	8370500	46.2		9356	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.639	1.639	0.0	1.000	2046808	14.9		663	
* 6 13C2-PFOA									
415.00 > 370.00	1.828	1.828	0.0		1462471	10.0		6465	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.828	1.828	0.0	1.000	4179728	30.9		808	
413.00 > 169.00	1.828	1.828	0.0	1.000	2273251		1.84(0.00-0.00)	6944	
* 7 13C4 PFOS									
503.00 > 80.00	2.079	2.079	0.0		3102658	28.7		6320	
9 Perfluorononanoic acid									
463.00 > 419.00	2.086	2.086	0.0	1.000	2745562	28.3		744	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.079	2.124	-0.045	1.000	6080009	59.9		2611	M
499.00 > 99.00	2.079	2.124	-0.045	1.000	1277253		4.76(0.00-0.00)	1995	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.253	2.253	0.0	1.000	1141288	10.2		7641	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L5_00024 Amount Added: 1.00 Units: mL

Report Date: 06-Feb-2018 13:49:56 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_029.d

Injection Date: 02-Feb-2018 16:07:03 Instrument ID: A8_N

Lims ID: CCV L5

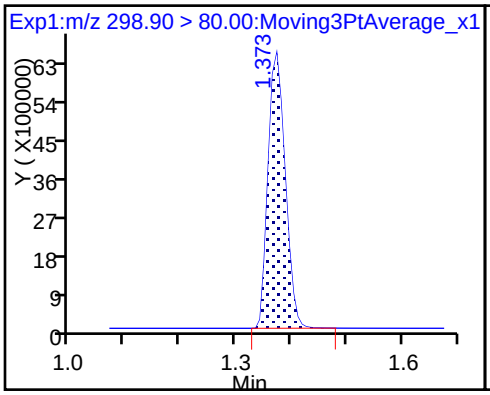
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 26

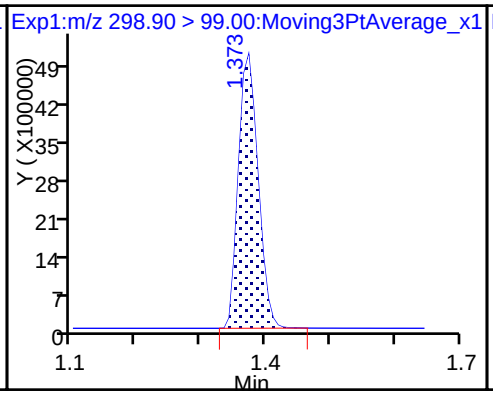
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

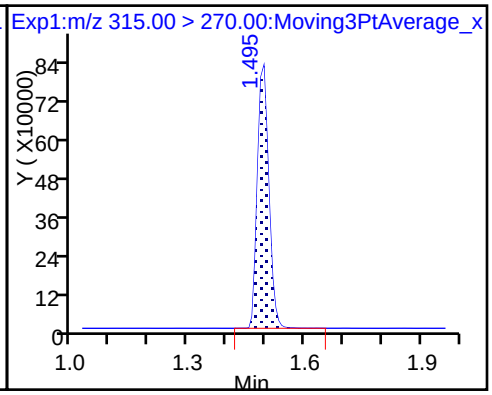
1 Perfluorobutanesulfonic acid



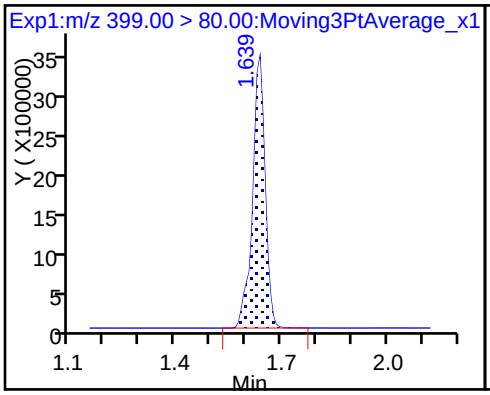
1 Perfluorobutanesulfonic acid



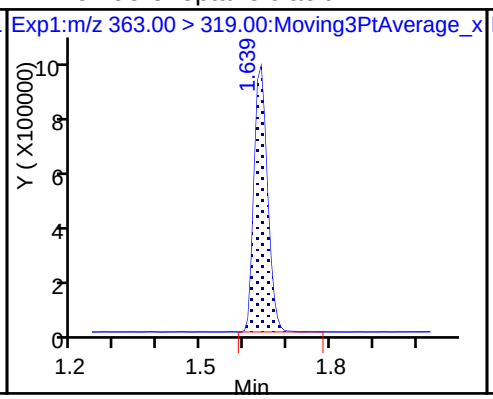
$ 2 13C2 PFHxA



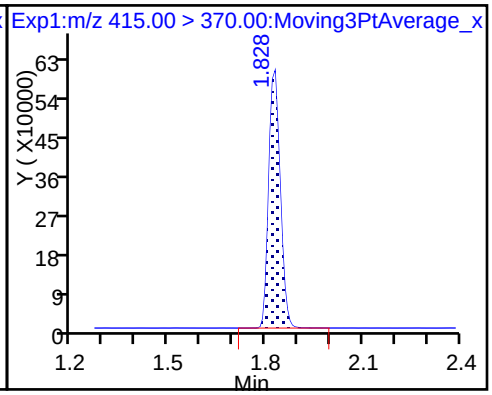
3 Perfluorohexanesulfonic acid



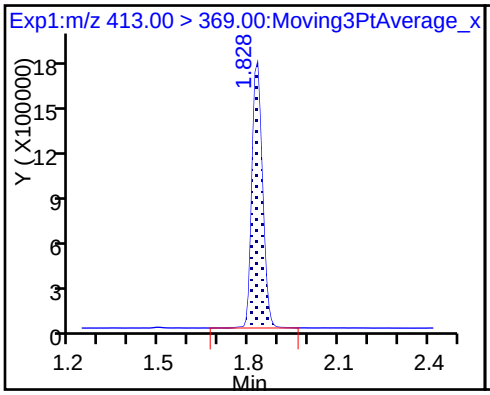
4 Perfluoroheptanoic acid



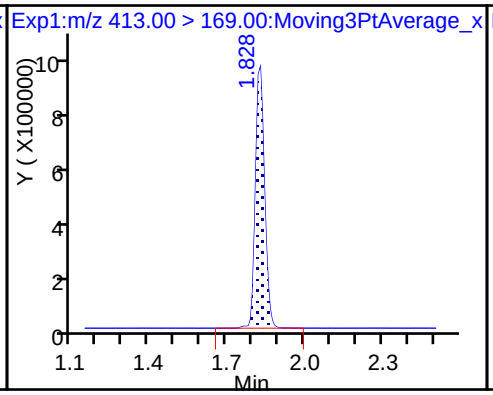
* 6 13C2-PFOA



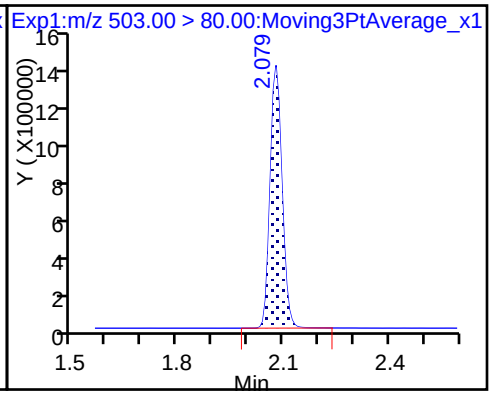
5 Perfluorooctanoic acid



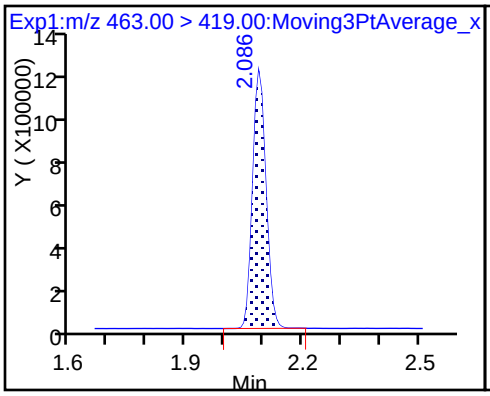
5 Perfluorooctanoic acid



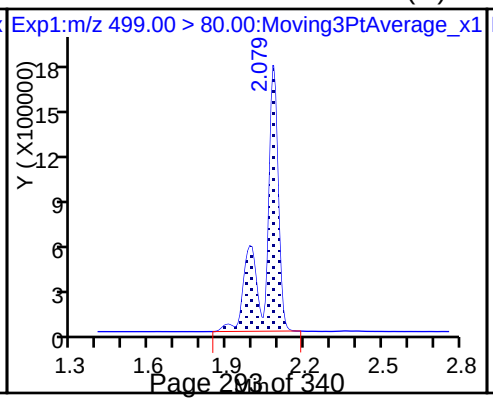
* 7 13C4 PFOS



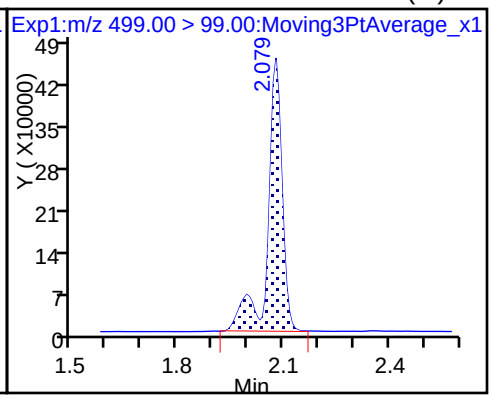
9 Perfluorononanoic acid



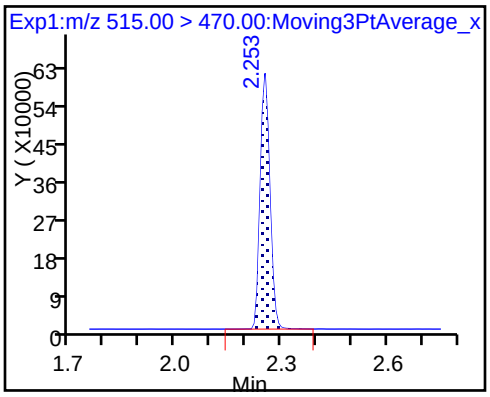
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.253
Y (X10000)
63
54
45
36
27
18
9
0
1.7
2.0
2.3
2.6
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

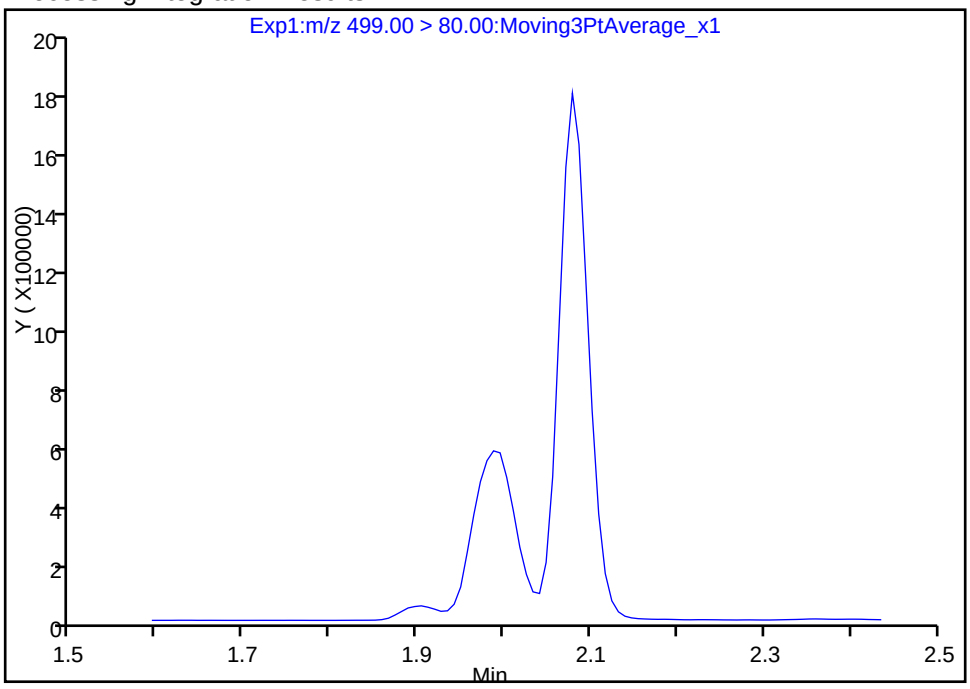
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_029.d
Injection Date: 02-Feb-2018 16:07:03 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 26
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

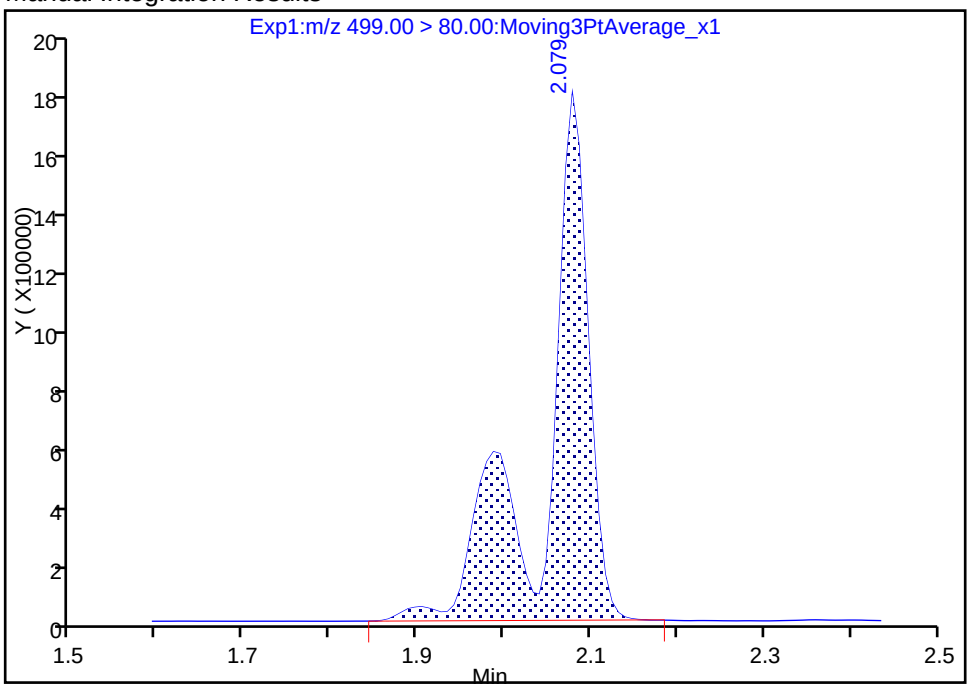
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.08
Area: 6080009
Amount: 59.855988
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:49:10
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

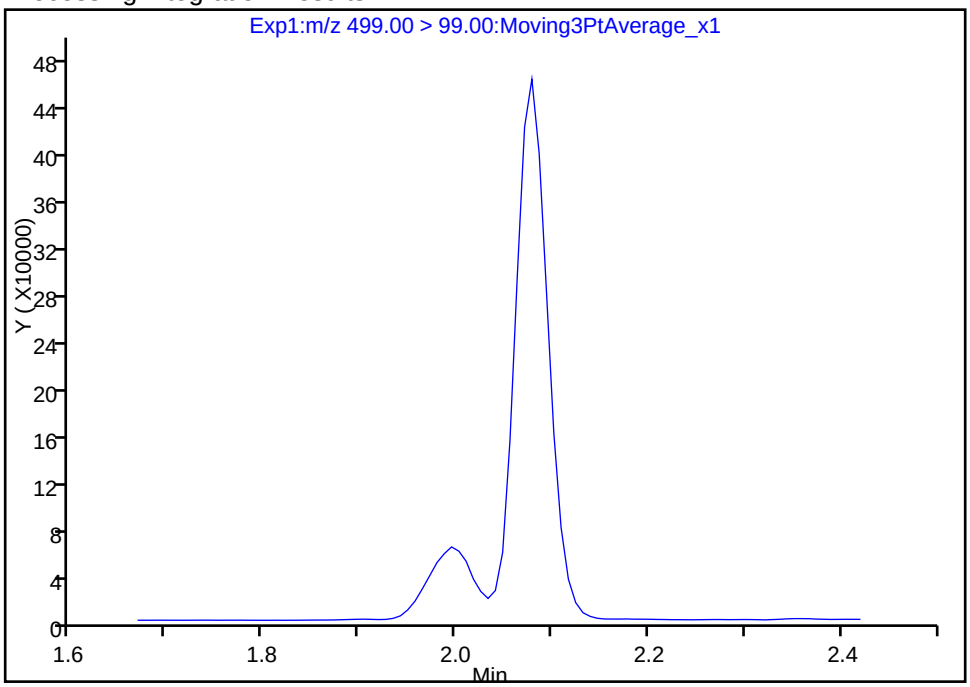
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_029.d
Injection Date: 02-Feb-2018 16:07:03 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 26
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

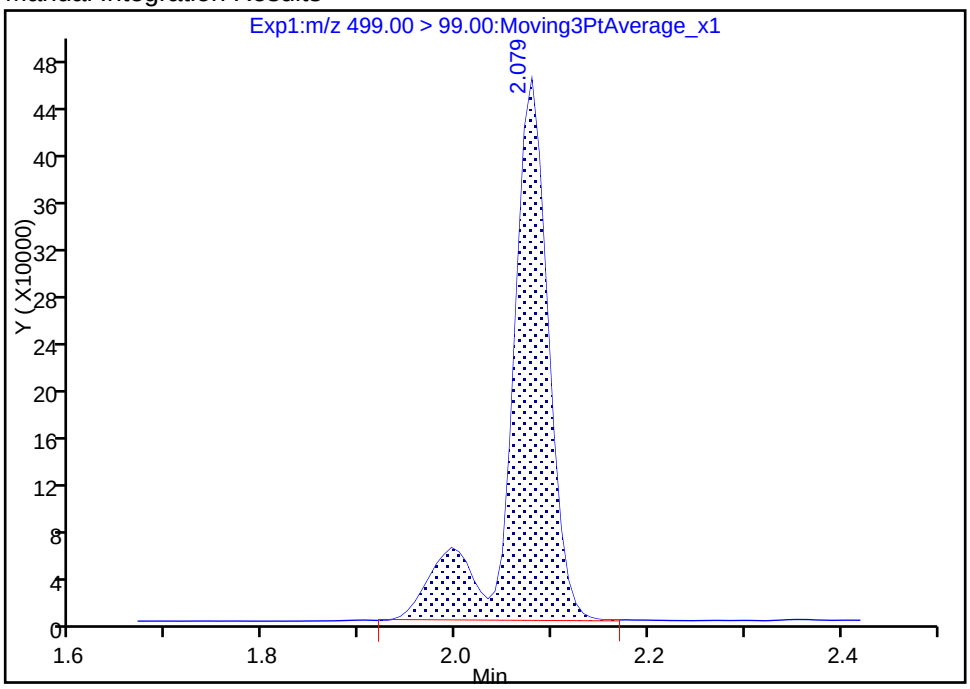
Processing Integration Results

Not Detected
Expected RT: 2.12



Manual Integration Results

RT: 2.08
Area: 1277253
Amount: 59.855988
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:49:14
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-205981/1-A

Matrix: Water | Lab File ID: 2018.02.02_537A_009.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 250.0(mL) | Date Analyzed: 02/02/2018 14:33

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

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

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

Analysis Batch No.: 206761 | 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	105		70-130
STL00996	13C2 PFDA	113		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_009.d
Lims ID: MB 320-205981/1-A
Client ID:
Sample Type: MB
Inject. Date: 02-Feb-2018 14:33:31 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-205981/1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:46:52 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:32:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.502	0.008	1.000	1537300	10.5		8578	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.844	0.007		1333051	10.0		6077	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.094	0.015		3005290	28.7		7123	
$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.261	0.015	1.000	1157096	11.3		8703	

Report Date: 06-Feb-2018 13:47:00 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_009.d

Injection Date: 02-Feb-2018 14:33:31 Instrument ID: A8_N

Lims ID: MB 320-205981/1-A

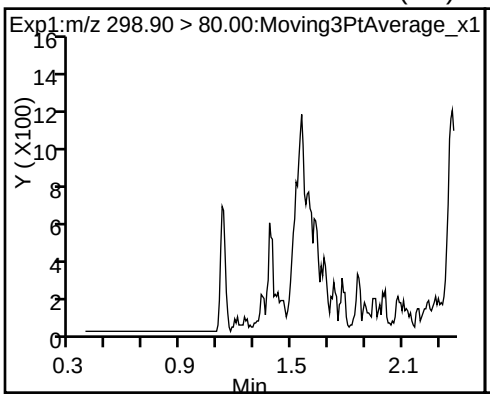
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6

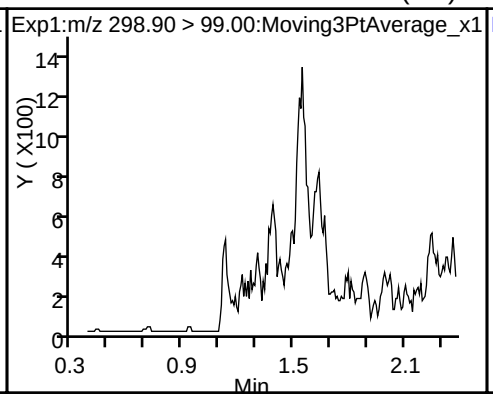
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

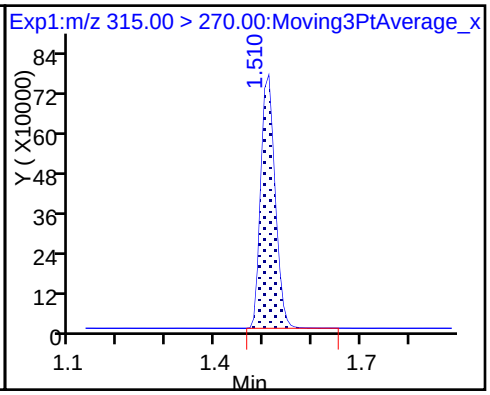
1 Perfluorobutanesulfonic acid (ND)



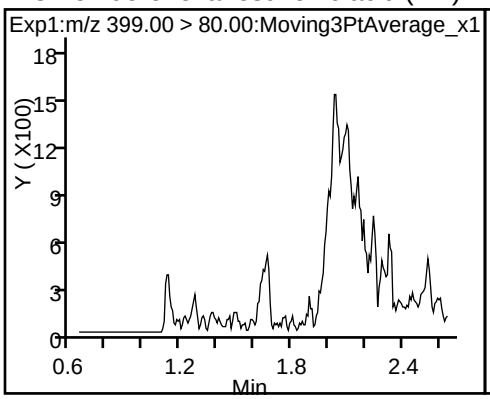
1 Perfluorobutanesulfonic acid (ND)



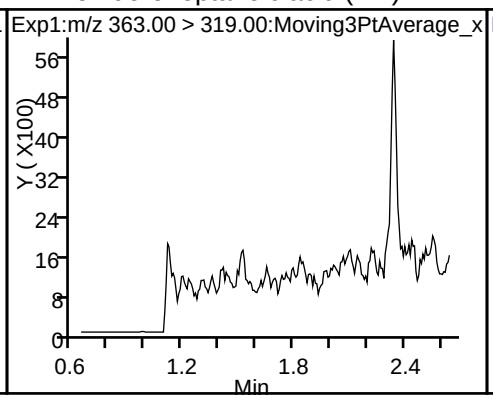
$ 2 13C2 PFHxA



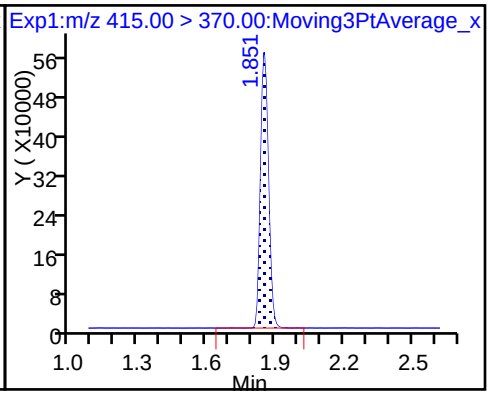
3 Perfluorohexanesulfonic acid (ND)



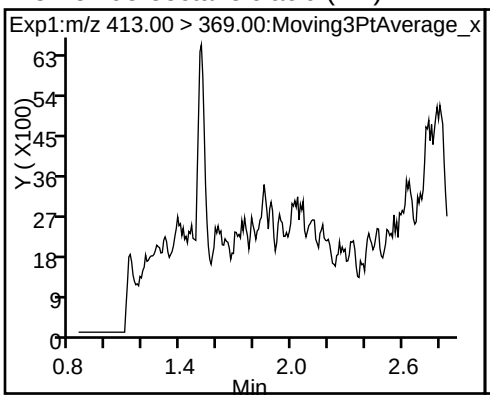
4 Perfluoroheptanoic acid (ND)



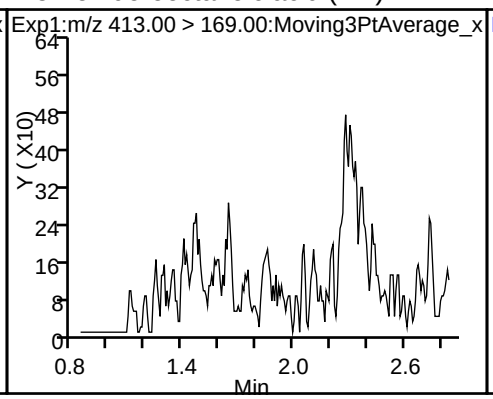
* 6 13C2-PFOA



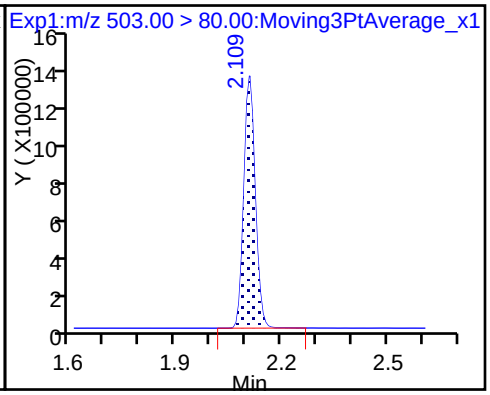
5 Perfluorooctanoic acid (ND)



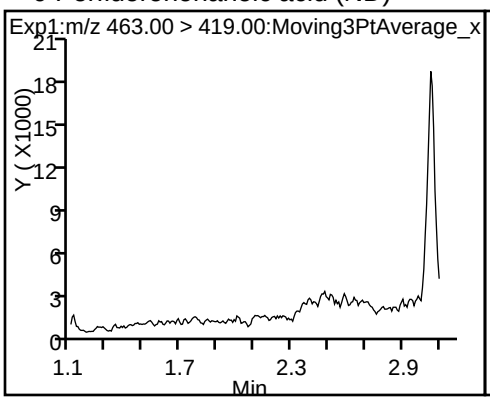
5 Perfluorooctanoic acid (ND)



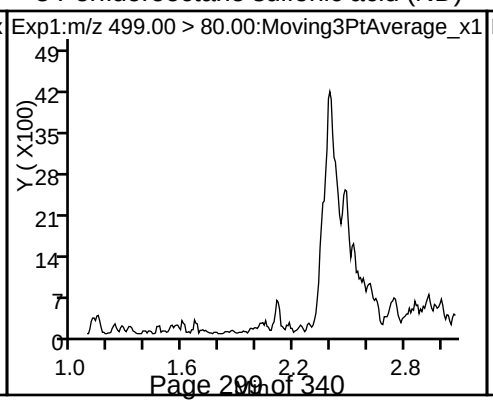
* 7 13C4 PFOS



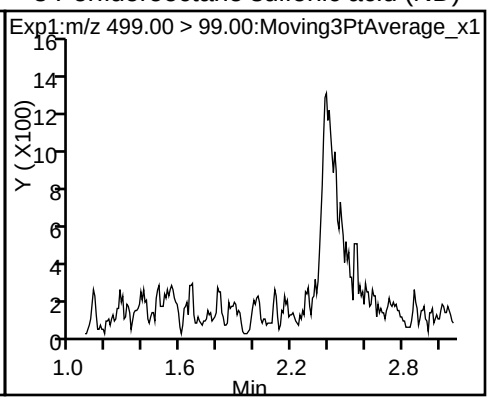
9 Perfluorononanoic acid (ND)



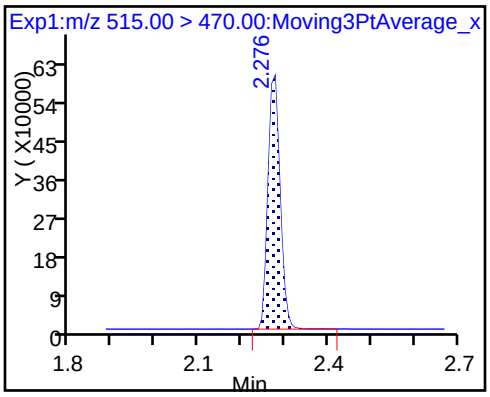
8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.276
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\20180202-53640.b\2018.02.02_537A_009.d
Lims ID: MB 320-205981/1-A
Client ID:
Sample Type: MB
Inject. Date: 02-Feb-2018 14:33:31 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-205981/1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:46:52 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:32:28

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.5	104.81
$ 10 13C2 PFDA	10.0	11.3	113.43

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: | Lab Sample ID: LLCS 320-205981/2-A

Matrix: Water | Lab File ID: 2018.02.02_537A_010.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 250.0(mL) | Date Analyzed: 02/02/2018 14:38

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

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

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

Analysis Batch No.: 206761 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	41.0	M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	21.1		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20.9	J	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	33.4		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	11.3		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	99.0		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	107		70-130
STL00996	13C2 PFDA	113		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_010.d
Lims ID: LLCS 320-205981/2-A
Client ID:
Sample Type: LLCS
Inject. Date: 02-Feb-2018 14:38:11 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: llcs 320-205981/2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:46:52 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:33:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.381	-0.008	1.000	2861492	24.7		4305	
298.90 > 99.00	1.373	1.381	-0.008	1.000	1985785		1.44(0.00-0.00)	3509	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1585031	10.7		8476	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.646	1.646	0.0	1.000	1493154	8.35		2408	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.646	1.646	0.0	1.000	356912	2.83		123	
* 6 13C2-PFOA									
415.00 > 370.00	1.844	1.844	0.0		1347572	10.0		6471	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.844	1.844	0.0	1.000	657819	5.27		130	
413.00 > 169.00	1.844	1.844	0.0	1.000	342159		1.92(0.00-0.00)	1183	
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.094	0.008		3064104	28.7		7291	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.102	0.007	1.000	467958	5.23		129	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.102	2.124	-0.022	1.000	1027936	10.2		629	M
499.00 > 99.00	2.102	2.124	-0.022	1.000	219616		4.68(0.00-0.00)	477	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.261	0.007	1.000	1167000	11.3		8336	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 06-Feb-2018 13:47:01 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_010.d

Injection Date: 02-Feb-2018 14:38:11 Instrument ID: A8_N

Lims ID: LLCS 320-205981/2-A

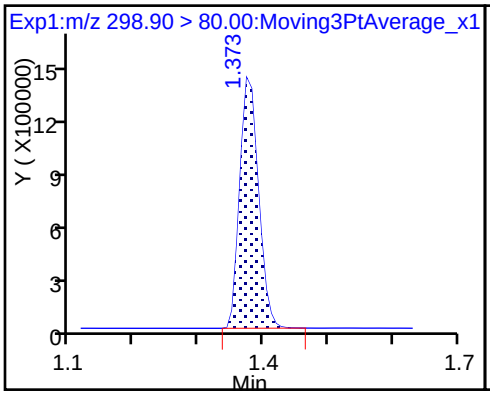
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7

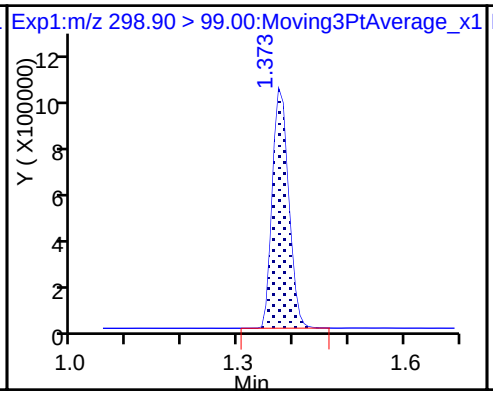
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

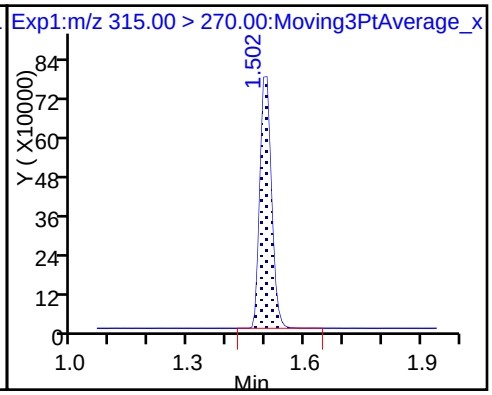
1 Perfluorobutanesulfonic acid



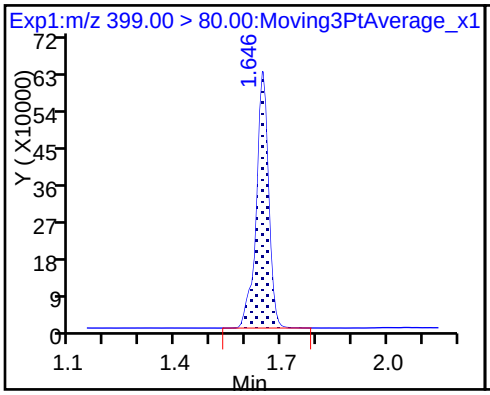
1 Perfluorobutanesulfonic acid



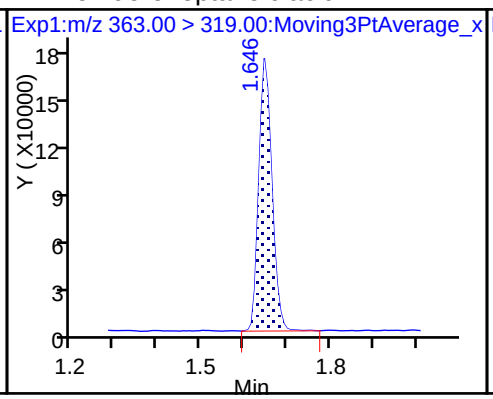
$ 2 13C2 PFHxA



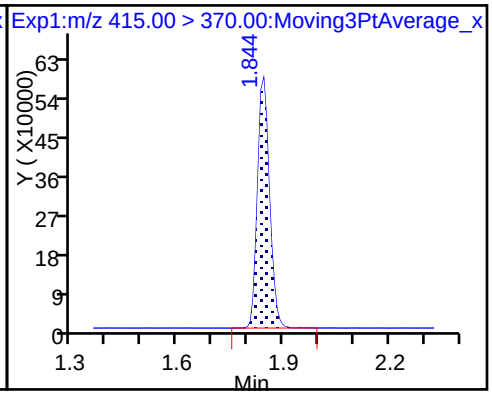
3 Perfluorohexanesulfonic acid



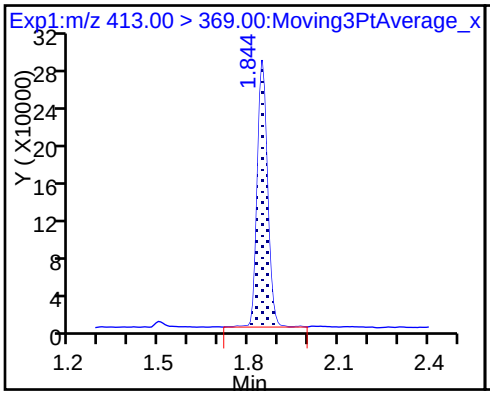
4 Perfluoroheptanoic acid



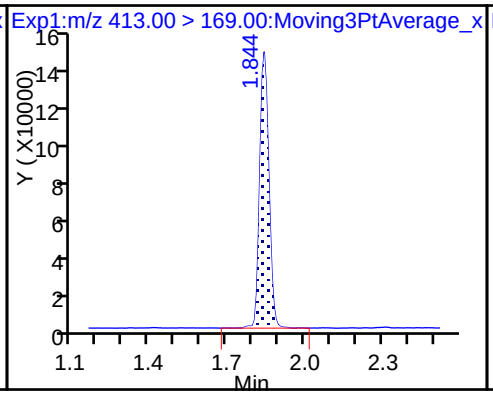
* 6 13C2-PFOA



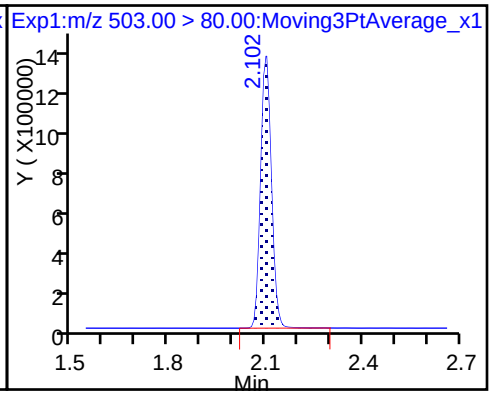
5 Perfluorooctanoic acid



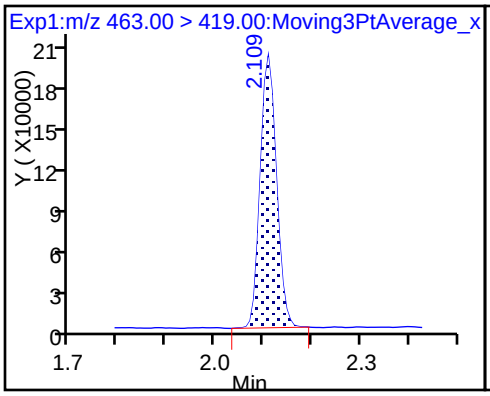
5 Perfluorooctanoic acid



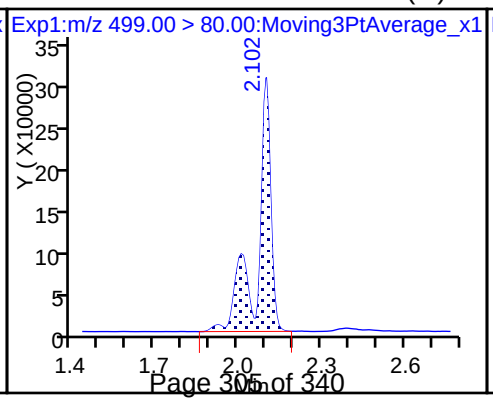
* 7 13C4 PFOS



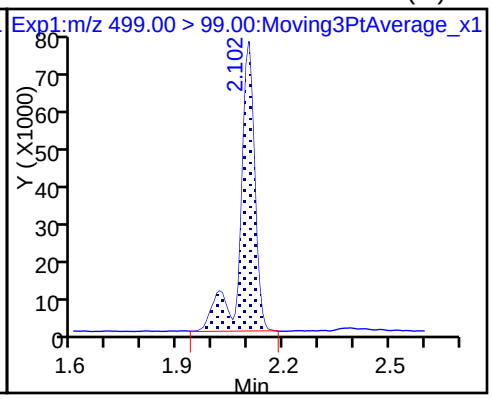
9 Perfluorononanoic acid



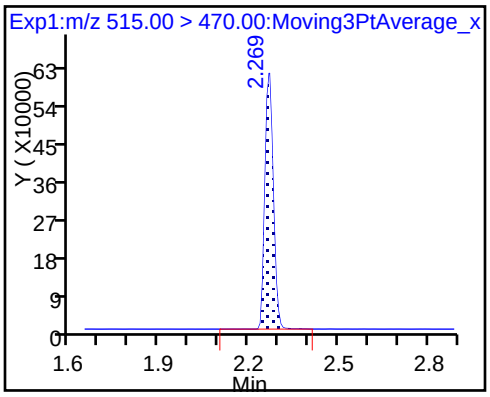
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.269
Y (X10000)
63
54
45
36
27
18
9
0
1.6
1.9
2.2
2.5
2.8
Min

TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_010.d
Lims ID: LLCS 320-205981/2-A
Client ID:
Sample Type: LLCS
Inject. Date: 02-Feb-2018 14:38:11 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: llcs 320-205981/2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:46:52 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:33:18

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.7	106.90
$ 10 13C2 PFDA	10.0	11.3	113.17

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

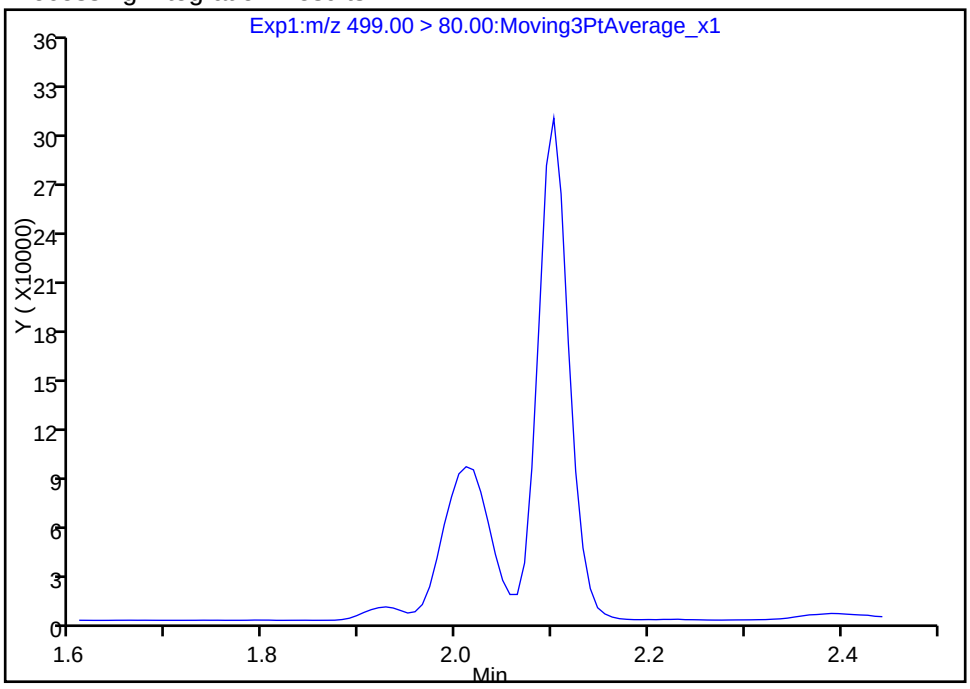
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_010.d				
Injection Date:	02-Feb-2018 14:38:11	Instrument ID:	A8_N		
Lims ID:	LLCS 320-205981/2-A				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

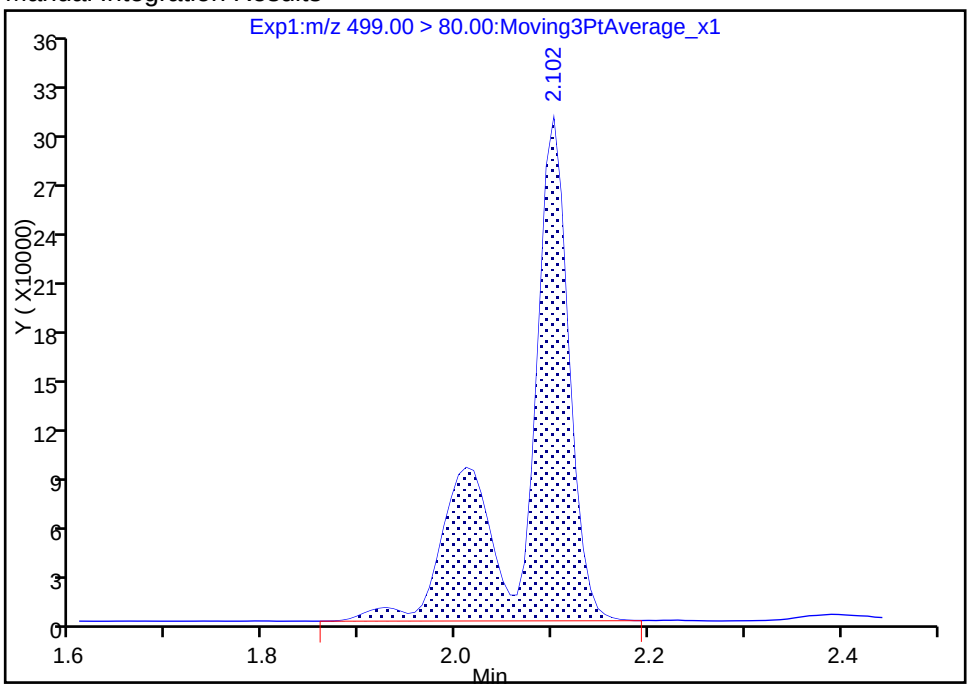
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 1027936
Amount: 10.247074
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:32:39
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

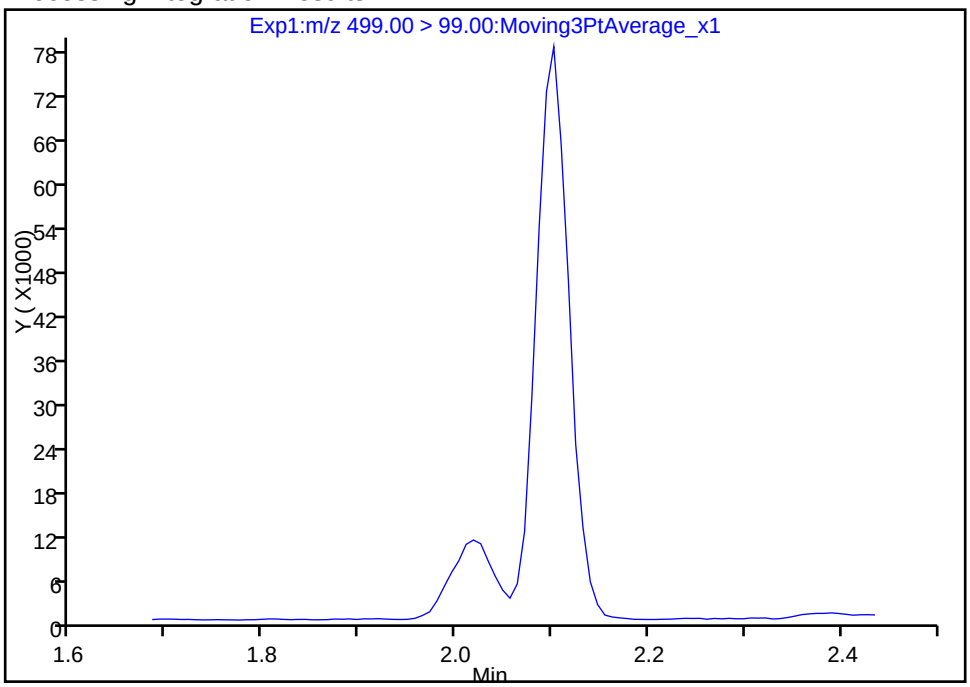
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_010.d
Injection Date: 02-Feb-2018 14:38:11 Instrument ID: A8_N
Lims ID: LLCS 320-205981/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

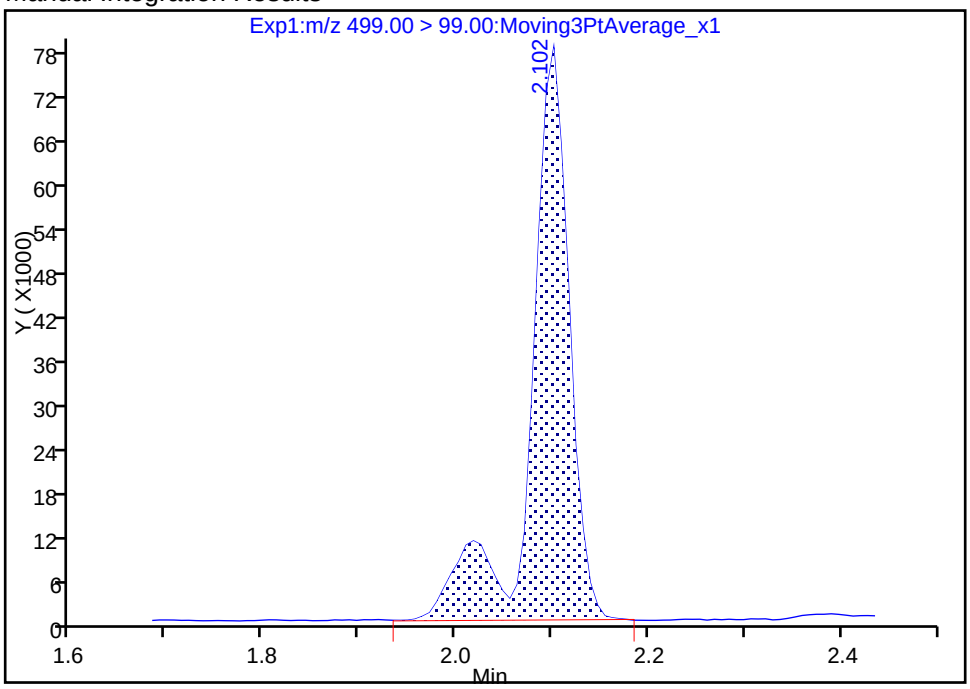
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 219616
Amount: 10.247074
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:32:49
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: | Lab Sample ID: LLCSD 320-205981/3-A

Matrix: Water | Lab File ID: 2018.02.02_537A_011.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 250.0(mL) | Date Analyzed: 02/02/2018 14:42

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

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

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

Analysis Batch No.: 206761 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	39.4	J M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	20.8		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20.6	J	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	31.9		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	11.2		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	91.9		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	110		70-130
STL00996	13C2 PFDA	115		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_011.d
Lims ID: LLCSD 320-205981/3-A
Client ID:
Sample Type: LLCSD
Inject. Date: 02-Feb-2018 14:42:52 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: llcsd 320-205981/3-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:46:52 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:34:06

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	2660171	23.0		4618	
298.90 > 99.00	1.381	1.381	0.0	1.000	2039644		1.30(0.00-0.00)	3417	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1621228	11.0		9068	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.646	1.646	0.0	1.000	1424936	7.97		2061	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.646	0.008	1.000	349779	2.80		115	
* 6 13C2-PFOA									
415.00 > 370.00	1.844	1.844	0.0		1334476	10.0		6445	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.844	1.844	0.0	1.000	641049	5.19		121	
413.00 > 169.00	1.844	1.844	0.0	1.000	344733		1.86(0.00-0.00)	1302	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.094	0.0		3061885	28.7		7315	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.102	0.007	1.000	455650	5.14		112	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.102	2.124	-0.022	1.000	987521	9.85		560	M
499.00 > 99.00	2.102	2.124	-0.022	1.000	213756		4.62(0.00-0.00)	482	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.261	0.007	1.000	1175873	11.5		7950	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 06-Feb-2018 13:47:02 Chrom Revision: 2.2 24-Jan-2018 15:37:30

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_011.d

Injection Date: 02-Feb-2018 14:42:52 Instrument ID: A8_N

Lims ID: LLCSD 320-205981/3-A

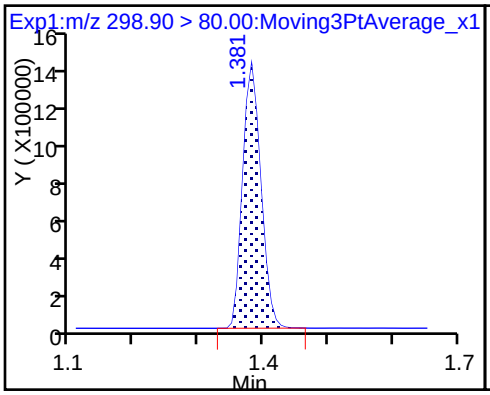
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8

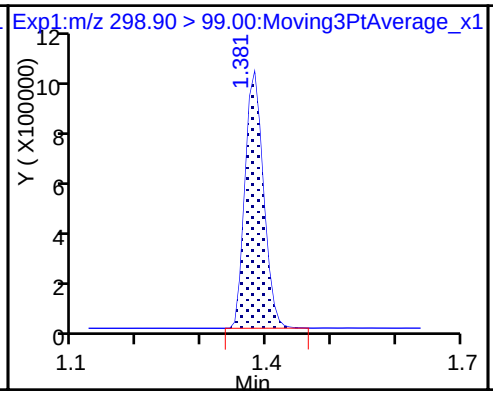
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

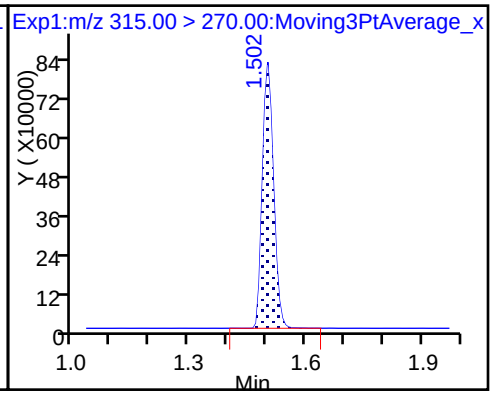
1 Perfluorobutanesulfonic acid



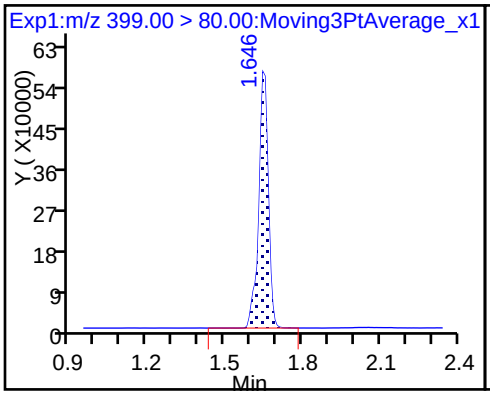
1 Perfluorobutanesulfonic acid



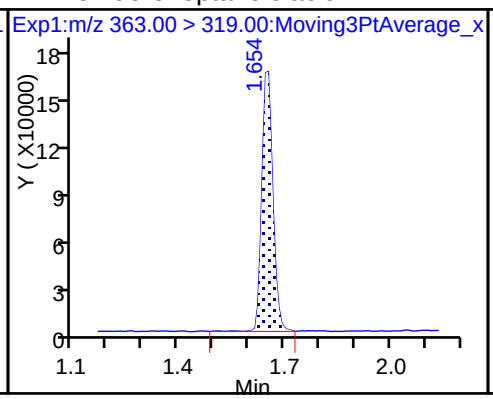
$ 2 13C2 PFHxA



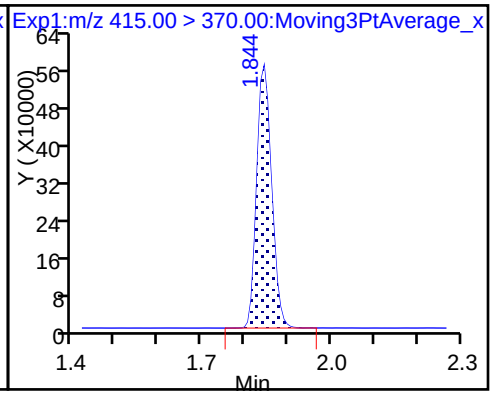
3 Perfluorohexanesulfonic acid



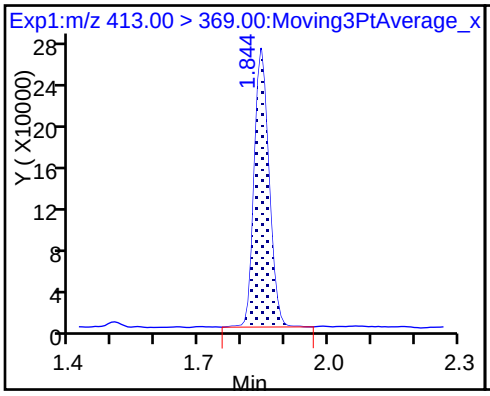
4 Perfluoroheptanoic acid



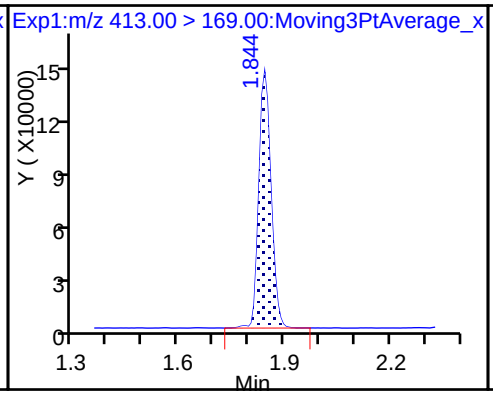
* 6 13C2-PFOA



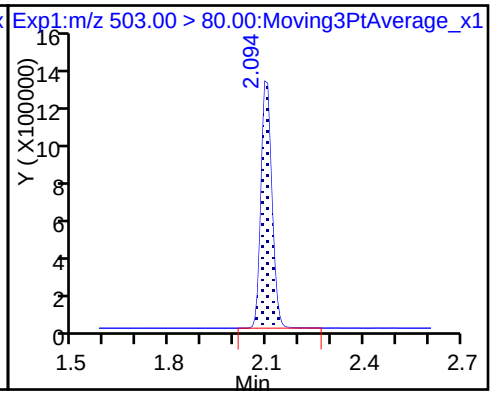
5 Perfluorooctanoic acid



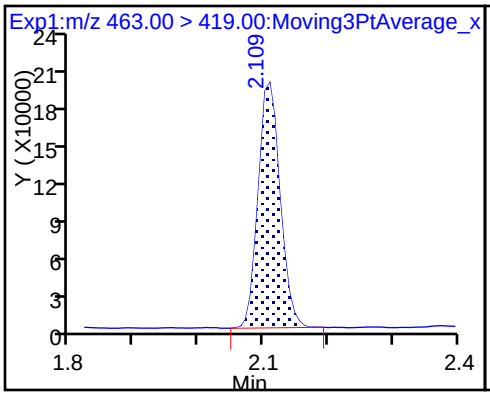
5 Perfluorooctanoic acid



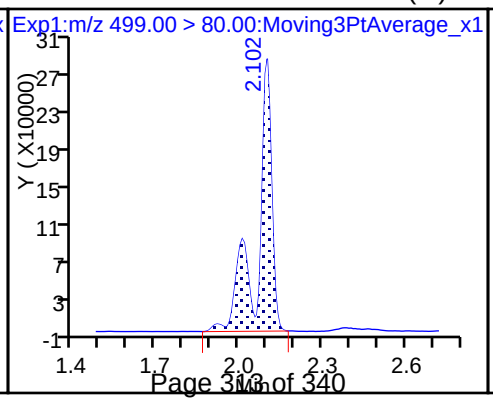
* 7 13C4 PFOS



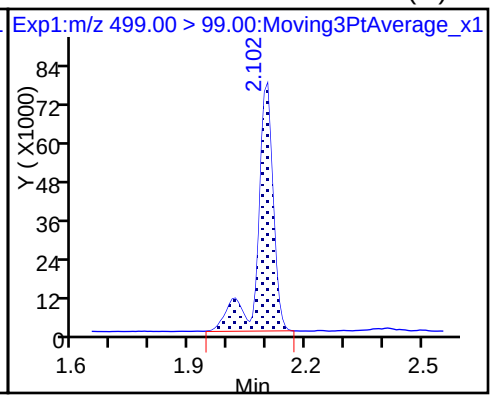
9 Perfluorononanoic acid



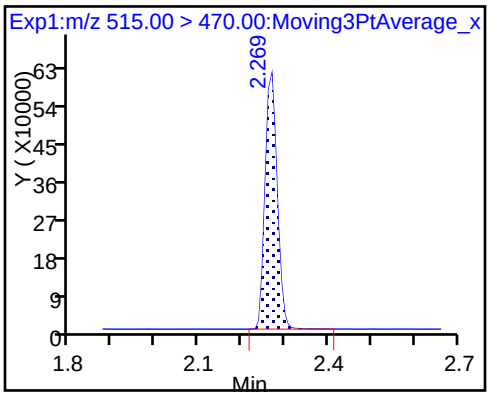
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.269
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\20180202-53640.b\2018.02.02_537A_011.d
Lims ID: LLCSD 320-205981/3-A
Client ID:
Sample Type: LLCSD
Inject. Date: 02-Feb-2018 14:42:52 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: llcsd 320-205981/3-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 06-Feb-2018 13:46:52 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: XAWRK055

First Level Reviewer: hannigana Date: 06-Feb-2018 13:34:06

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	11.0	110.41
$ 10 13C2 PFDA	10.0	11.5	115.15

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

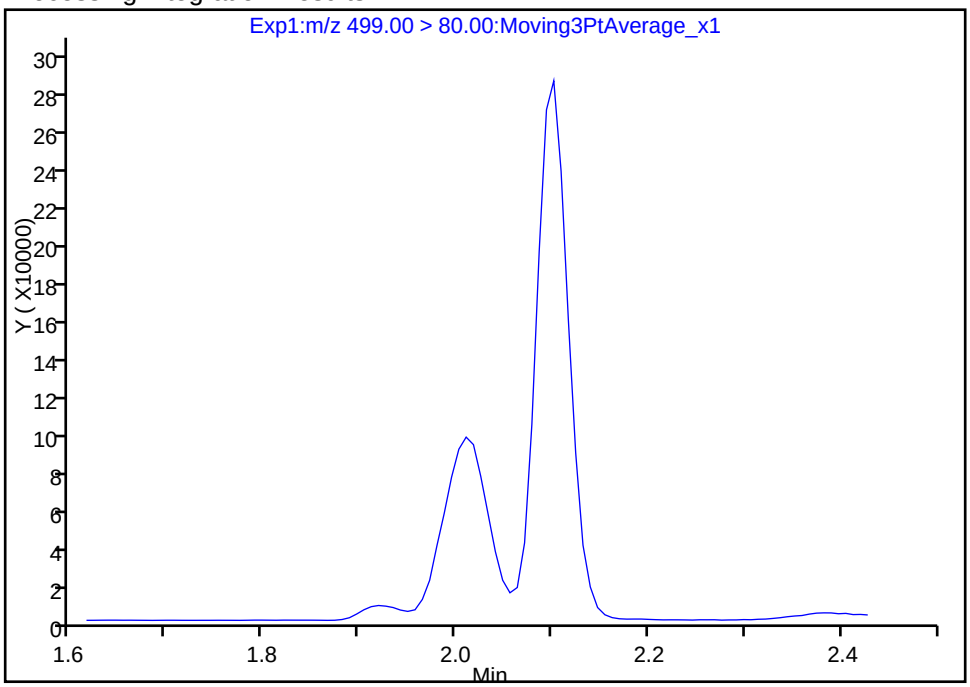
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_011.d
Injection Date: 02-Feb-2018 14:42:52 Instrument ID: A8_N
Lims ID: LLCSD 320-205981/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

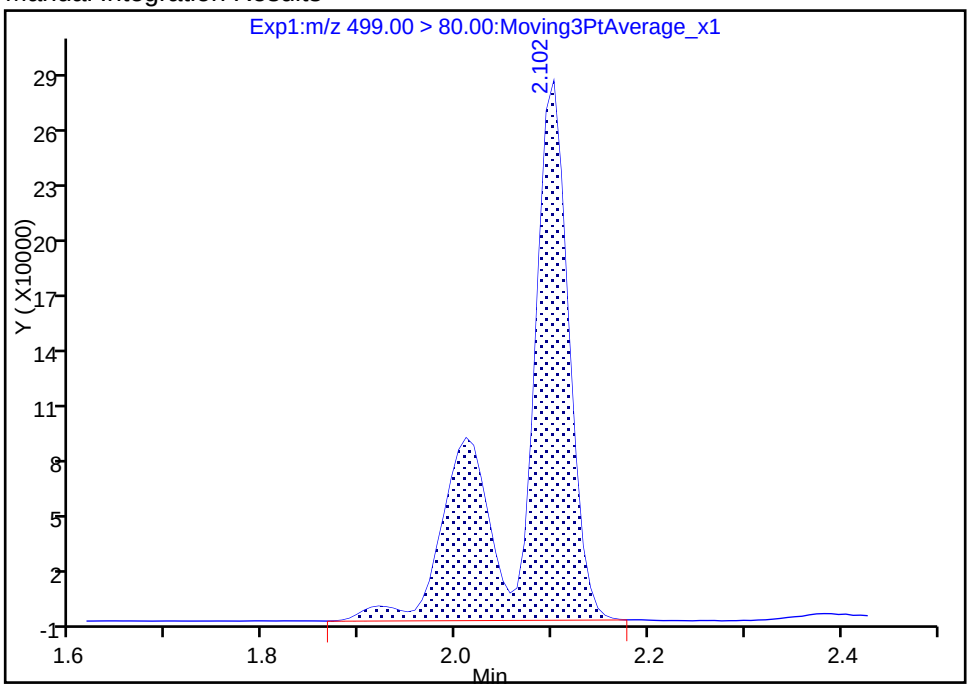
Not Detected
Expected RT: 2.12

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 987521
Amount: 9.851327
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:33:36
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

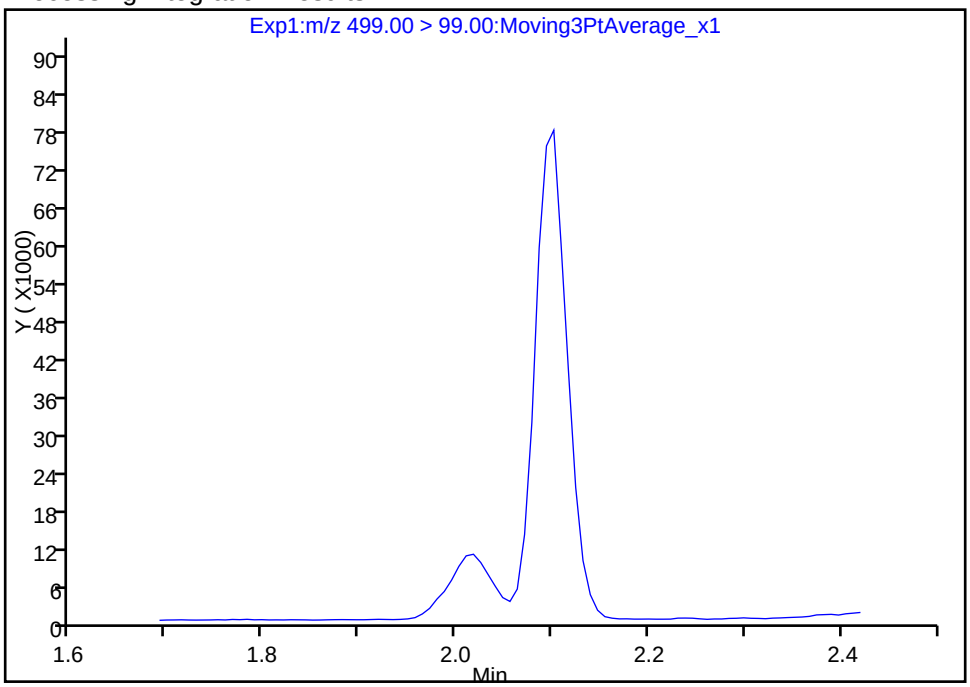
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b\2018.02.02_537A_011.d
Injection Date: 02-Feb-2018 14:42:52 Instrument ID: A8_N
Lims ID: LLCSD 320-205981/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

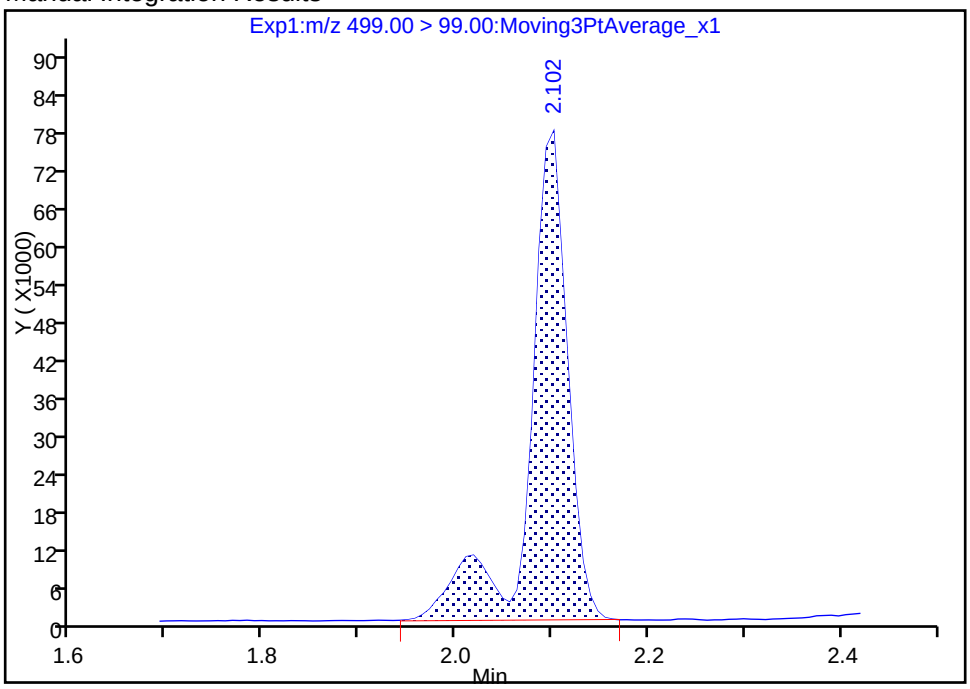
Processing Integration Results

Not Detected
Expected RT: 2.12



Manual Integration Results

RT: 2.10
Area: 213756
Amount: 9.851327
Amount Units: ng/ml



Reviewer: hannigana, 06-Feb-2018 13:33:42
Audit Action: Manually Integrated Audit Reason: Assign Peak

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

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.: 320-35090-1

SDG No.:

Instrument ID: A8_N Start Date: 02/02/2018 14:10

Analysis Batch Number: 206761 End Date: 02/02/2018 15:10

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-206761/1		02/02/2018 14:10	1	2018.02.02_537A_004.d	GeminiC18 3x100 3(mm)
CCV 320-206761/2 CCVIS		02/02/2018 14:14	1	2018.02.02_537A_005.d	GeminiC18 3x100 3(mm)
MB 320-205981/1-A		02/02/2018 14:33	1	2018.02.02_537A_009.d	GeminiC18 3x100 3(mm)
LLCS 320-205981/2-A		02/02/2018 14:38	1	2018.02.02_537A_010.d	GeminiC18 3x100 3(mm)
LLCSD 320-205981/3-A		02/02/2018 14:42	1	2018.02.02_537A_011.d	GeminiC18 3x100 3(mm)
320-35090-1		02/02/2018 14:47	1	2018.02.02_537A_012.d	GeminiC18 3x100 3(mm)
320-35090-2		02/02/2018 14:52	1	2018.02.02_537A_013.d	GeminiC18 3x100 3(mm)
320-35090-3		02/02/2018 14:56	1	2018.02.02_537A_014.d	GeminiC18 3x100 3(mm)
320-35090-4		02/02/2018 15:01	1	2018.02.02_537A_015.d	GeminiC18 3x100 3(mm)
320-35090-5		02/02/2018 15:06	1	2018.02.02_537A_016.d	GeminiC18 3x100 3(mm)
CCV 320-206761/14 CCVIS		02/02/2018 15:10	1	2018.02.02_537A_017.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Instrument ID: A8_N Start Date: 02/02/2018 15:10

Analysis Batch Number: 206762 End Date: 02/02/2018 16:07

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-206762/14 CCVIS		02/02/2018 15:10	1	2018.02.02_537A 017.d	GeminiC18 3x100 3(mm)
320-35090-6		02/02/2018 15:20	1	2018.02.02_537A 019.d	GeminiC18 3x100 3(mm)
320-35090-7		02/02/2018 15:24	1	2018.02.02_537A 020.d	GeminiC18 3x100 3(mm)
320-35090-8		02/02/2018 15:29	1	2018.02.02_537A 021.d	GeminiC18 3x100 3(mm)
320-35090-9		02/02/2018 15:34	1	2018.02.02_537A 022.d	GeminiC18 3x100 3(mm)
320-35090-10		02/02/2018 15:38	1	2018.02.02_537A 023.d	GeminiC18 3x100 3(mm)
320-35090-11		02/02/2018 15:43	1	2018.02.02_537A 024.d	GeminiC18 3x100 3(mm)
320-35090-12		02/02/2018 15:48	1	2018.02.02_537A 025.d	GeminiC18 3x100 3(mm)
320-35090-13		02/02/2018 15:53	1	2018.02.02_537A 026.d	GeminiC18 3x100 3(mm)
320-35090-14		02/02/2018 15:57	1	2018.02.02_537A 027.d	GeminiC18 3x100 3(mm)
320-35090-15		02/02/2018 16:02	1	2018.02.02_537A 028.d	GeminiC18 3x100 3(mm)
CCV 320-206762/26 CCVIS		02/02/2018 16:07	1	2018.02.02_537A 029.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Batch Number: 205981 Batch Start Date: 01/29/18 12:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 02/01/18 22:45

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00055
MB 320-205981/1		537, 537				250.0 mL	1.0 mL	7 SU	100 uL
LLCS 320-205981/2		537, 537				250.0 mL	1.0 mL	7 SU	100 uL
LLCSD 320-205981/3		537, 537				250.0 mL	1.0 mL	7 SU	100 uL
320-35090-A-1	NAWC-011518-RW-21	537, 537	T	277.08 g	28.46 g	248.6 mL	1.0 mL	7 SU	100 uL
320-35090-A-2	NAWC-011518-FRB-21	537, 537	T	276.37 g	26.94 g	249.4 mL	1.0 mL	7 SU	100 uL
320-35090-A-3	NAWC-011518-RW-233	537, 537	T	282.92 g	29.23 g	253.7 mL	1.0 mL	7 SU	100 uL
320-35090-A-4	NAWC-011518-FRB-233	537, 537	T	277.27 g	26.69 g	250.6 mL	1.0 mL	7 SU	100 uL
320-35090-A-5	NAWC-011518-RW-241	537, 537	T	277.42 g	28.39 g	249 mL	1.0 mL	7 SU	100 uL
320-35090-A-6	NAWC-011518-FRB-241	537, 537	T	280.52 g	27.33 g	253.2 mL	1.0 mL	7 SU	100 uL
320-35090-A-7	WGNA-011518-RW-3385	537, 537	T	274.25 g	28.43 g	245.8 mL	1.0 mL	7 SU	100 uL
320-35090-A-8	WGNA-011518-FRB-3385	537, 537	T	277.01 g	26.89 g	250.1 mL	1.0 mL	7 SU	100 uL
320-35090-A-9	WGNA-011518-DUP19	537, 537	T	275.74 g	28.65 g	247.1 mL	1.0 mL	7 SU	100 uL
320-35090-A-10	NAWC-011518-RW-213	537, 537	T	276.83 g	27.93 g	248.9 mL	1.0 mL	7 SU	100 uL
320-35090-A-11	NAWC-011518-FRB-213	537, 537	T	277.65 g	27.01 g	250.6 mL	1.0 mL	7 SU	100 uL
320-35090-A-12	NAWC-011518-RW-215	537, 537	T	274.74 g	27.16 g	247.6 mL	1.0 mL	7 SU	100 uL
320-35090-A-13	NAWC-011518-FRB-215	537, 537	T	278.86 g	27.32 g	251.5 mL	1.0 mL	7 SU	100 uL
320-35090-A-14	NAWC-011518-RW-48	537, 537	T	273.05 g	27.03 g	246 mL	1.0 mL	7 SU	100 uL
320-35090-A-15	NAWC-011518-FRB-48	537, 537	T	277.11 g	26.76 g	250.4 mL	1.0 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-LSP 00025	LC537-SU 00055	AnalysisComment			
MB 320-205981/1		537, 537			100 uL	Cl ND			
LLCS 320-205981/2		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.: 320-35090-1

SDG No.:

Batch Number: 205981 Batch Start Date: 01/29/18 12:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 02/01/18 22:45

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-LSP 00025	LC537-SU 00055	AnalysisComment			
LLCSD 320-205981/3		537, 537		100 uL	100 uL	Cl ND			
320-35090-A-1	NAWC-011518-RW-21	537, 537	T		100 uL	Cl ND			
320-35090-A-2	NAWC-011518-FRB-21	537, 537	T		100 uL	Cl ND			
320-35090-A-3	NAWC-011518-RW-233	537, 537	T		100 uL	Cl ND			
320-35090-A-4	NAWC-011518-FRB-233	537, 537	T		100 uL	Cl ND			
320-35090-A-5	NAWC-011518-RW-241	537, 537	T		100 uL	Cl ND			
320-35090-A-6	NAWC-011518-FRB-241	537, 537	T		100 uL	Cl ND			
320-35090-A-7	WGNA-011518-RW-3385	537, 537	T		100 uL	Cl ND			
320-35090-A-8	WGNA-011518-FRB-3385	537, 537	T		100 uL	Cl ND			
320-35090-A-9	WGNA-011518-DUP19	537, 537	T		100 uL	Cl ND			
320-35090-A-10	NAWC-011518-RW-213	537, 537	T		100 uL	Cl ND			
320-35090-A-11	NAWC-011518-FRB-213	537, 537	T		100 uL	Cl ND			
320-35090-A-12	NAWC-011518-RW-215	537, 537	T		100 uL	Cl ND			
320-35090-A-13	NAWC-011518-FRB-215	537, 537	T		100 uL	Cl ND			
320-35090-A-14	NAWC-011518-RW-48	537, 537	T		100 uL	Cl ND			
320-35090-A-15	NAWC-011518-FRB-48	537, 537	T		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.: 320-35090-1

SDG No.:

Batch Number: 205981 Batch Start Date: 01/29/18 12:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 02/01/18 22:45

Batch Notes	
Analyst ID - Aliquot Step	JER
Batch Comment	Label ID's checked: KMK 1-29-18
Analyst ID - Concentration	KMK/CCB
Analyst ID - Final Volume Step	CCB
Internal Standard ID#	1099355
Manifold ID	3, 10
Methanol ID	1127839
pH Indicator ID	2517
Pipette ID	M16387D
Analyst ID - IS Reagent Drop	CCB
Analyst ID - IS Reagent Drop Witness	TWL
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	KMK
Analyst ID - TA Reagent Drop	JER
Analyst ID - TA Reagent Drop Witness	KMK
SPE Cartridge ID	6369499-04
Trizma ID	SLBR4303V
Reagent Water ID	1-25-18

Basis	Basis Description
T	Total/NA

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento

Method 537 CCV/Data Review Checklist

Job No: 320-35090 Instrument ID & Date: A8 2/2/18 ICAL Batch: 192908
Extraction Batch: 205981 Worklist #: 536940 TALS Batch: 206761, 206762

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? 0 Dilutions due to non-targets? 0	✓			✓
5. All target compounds in MB < 1/3 RL ? **(Requires NCM if "no.")**	✓			✓
6. Are target constituents in LCS/LCSD within method control limits?	✓			✓
7. Internal Standard areas in control for all samples and QC reported? ±50% from the average area of the ICAL and 70-140% of the most recent CCV	✓			✓
8. Do results (e.g., dilutions/trip blanks) make sense?	✓			✓
9. Are MS/MSD recoveries and RPDs within method control limits?	✓			✓
10. Are all QC samples properly linked in TALS?	✓			✓
11. All manual integrations appropriate and completely documented?	✓			✓
12. Are nonconformances documented as NCMs?	✓			✓
13. Are all Chrom graphics uploaded?	✓			✓

1st Level Reviewer / Date: ABH/KR 2/6/2018 2nd Level Reviewer / Date: 2/6/2018

NCM # and Comments: _____

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	Level 1 No	Level 1 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 ≤ ½RL~~ 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: 11/6/2017

NCM # and Comments: _____

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 02FEB2018_537A Worklist Number: 53640
Instrument Name: A8_N Chrom Method: 537_A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b
QC Batching: Enabled Limit Group Batching: Enabled

QC Batch: 1	LC 537 CS ICAL Raw Batch: 206760	LC 537 ICAL Raw Batch: 206761
# 1 CCVL	# 1 CCVL	# 1 CCVL
# 2 CCV L5	# 2 CCV L5	# 2 CCV L5
# 3 RB	# 3 RB	# 3 RB
# 4 QC 537 CART 6369499-05 MB	# 4 QC 537 CART 6369499-05 MB	# 4 QC 537 CART 6369499-05 MB
# 5 QC 537 CART 6369499-05 LCS	# 5 QC 537 CART 6369499-05 LCS	# 5 QC 537 CART 6369499-05 LCS
# 6 MB 320-205981/1-A		# 6 MB 320-205981/1-A
# 7 LLCS 320-205981/2-A		# 7 LLCS 320-205981/2-A
# 8 LLCSD 320-205981/3-A		# 8 LLCSD 320-205981/3-A
# 9 320-35090-A-1-A		# 9 320-35090-A-1-A
#10 320-35090-A-2-A		#10 320-35090-A-2-A
#11 320-35090-A-3-A		#11 320-35090-A-3-A
#12 320-35090-A-4-A		#12 320-35090-A-4-A
#13 320-35090-A-5-A		#13 320-35090-A-5-A
#14 CCV L3	#14 CCV L3	#14 CCV L3

QC Batch: 2	LC 537 ICAL Raw Batch: 206762	LC 537 CS ICAL Raw Batch: 206763
#14 CCV L3	#14 CCV L3	#14 CCV L3
#15 RB	#15 RB	#15 RB
#16 320-35090-A-6-A	#16 320-35090-A-6-A	
#17 320-35090-A-7-A	#17 320-35090-A-7-A	
#18 320-35090-A-8-A	#18 320-35090-A-8-A	
#19 320-35090-A-9-A	#19 320-35090-A-9-A	
#20 320-35090-A-10-A	#20 320-35090-A-10-A	
#21 320-35090-A-11-A	#21 320-35090-A-11-A	
#22 320-35090-A-12-A	#22 320-35090-A-12-A	
#23 320-35090-A-13-A	#23 320-35090-A-13-A	
#24 320-35090-A-14-A	#24 320-35090-A-14-A	
#25 320-35090-A-15-A	#25 320-35090-A-15-A	
#26 CCV L5	#26 CCV L5	#26 CCV L5
#27 RB	#27 RB	#27 RB

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 02FEB2018_537A Worklist Num: 53640
Instrument: A8_N Method: 537_A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180202-53640.b
Anaylysis Type: SemiVOA Creator: Phomsopha, Thep
Inj Volume: 2.00 Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCVL	320-0053640-001	CCVL	02-Feb-2018 14:10:10	2018.02.02_537A_004.d	2	1.0		sv
CCV L5	320-0053640-002	CCVIS	02-Feb-2018 14:14:49	2018.02.02_537A_005.d	5	1.0		sv
RB	320-0053640-003	RB	02-Feb-2018 14:19:29	2018.02.02_537A_006.d	8	1.0		sv
QC 537 CART 6369499-05 MB	320-0053640-004	QC	02-Feb-2018 14:24:09	2018.02.02_537A_007.d	1	1.0		sv
QC 537 CART 6369499-05 LCS	320-0053640-005	QC	02-Feb-2018 14:28:49	2018.02.02_537A_008.d	2	1.0		sv
MB 320-205981/1-A	320-0053640-006	MB	02-Feb-2018 14:33:31	2018.02.02_537A_009.d	3	1.0		sv
LLCS 320-205981/2-A	320-0053640-007	LLCS	02-Feb-2018 14:38:11	2018.02.02_537A_010.d	4	1.0		sv
LLCSD 320-205981/3-A	320-0053640-008	LLCSD	02-Feb-2018 14:42:52	2018.02.02_537A_011.d	5	1.0		sv
320-35090-A-1-A	320-0053640-009	Client	02-Feb-2018 14:47:32	2018.02.02_537A_012.d	6	1.0	NAWC-011518-RW-21	sv
320-35090-A-2-A	320-0053640-010	Client	02-Feb-2018 14:52:12	2018.02.02_537A_013.d	7	1.0	NAWC-011518-FRB-21	sv
320-35090-A-3-A	320-0053640-011	Client	02-Feb-2018 14:56:52	2018.02.02_537A_014.d	8	1.0	NAWC-011518-RW-233	sv
320-35090-A-4-A	320-0053640-012	Client	02-Feb-2018 15:01:33	2018.02.02_537A_015.d	9	1.0	NAWC-011518-FRB-233	sv
320-35090-A-5-A	320-0053640-013	Client	02-Feb-2018 15:06:12	2018.02.02_537A_016.d	10	1.0	NAWC-011518-RW-241	sv
CCV L3	320-0053640-014	CCVIS	02-Feb-2018 15:10:54	2018.02.02_537A_017.d	3	1.0		sv
RB	320-0053640-015	RB	02-Feb-2018 15:15:33	2018.02.02_537A_018.d	8	1.0		sv
320-35090-A-6-A	320-0053640-016	Client	02-Feb-2018 15:20:13	2018.02.02_537A_019.d	11	1.0	NAWC-011518-FRB-241	sv
320-35090-A-7-A	320-0053640-017	Client	02-Feb-2018 15:24:55	2018.02.02_537A_020.d	12	1.0	WGNA-011518-RW-3385	sv
320-35090-A-8-A	320-0053640-018	Client	02-Feb-2018 15:29:36	2018.02.02_537A_021.d	13	1.0	WGNA-011518-FRB-3385	sv
320-35090-A-9-A	320-0053640-019	Client	02-Feb-2018 15:34:18	2018.02.02_537A_022.d	14	1.0	WGNA-011518-DUP19	sv
320-35090-A-10-A	320-0053640-020	Client	02-Feb-2018 15:38:59	2018.02.02_537A_023.d	15	1.0	NAWC-011518-RW-213	sv
320-35090-A-11-A	320-0053640-021	Client	02-Feb-2018 15:43:40	2018.02.02_537A_024.d	16	1.0	NAWC-011518-FRB-213	sv
320-35090-A-12-A	320-0053640-022	Client	02-Feb-2018 15:48:20	2018.02.02_537A_025.d	17	1.0	NAWC-011518-RW-215	sv
320-35090-A-13-A	320-0053640-023	Client	02-Feb-2018 15:53:00	2018.02.02_537A_026.d	18	1.0	NAWC-011518-FRB-215	sv
320-35090-A-14-A	320-0053640-024	Client	02-Feb-2018 15:57:41	2018.02.02_537A_027.d	19	1.0	NAWC-011518-RW-48	sv
320-35090-A-15-A	320-0053640-025	Client	02-Feb-2018 16:02:22	2018.02.02_537A_028.d	20	1.0	NAWC-011518-FRB-48	sv

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCV L5	320-0053640-026	CCVIS	02-Feb-2018 16:07:03	2018.02.02_537A_029.d	5	1.0		sv
RB	320-0053640-027	RB	02-Feb-2018 16:11:42	2018.02.02_537A_030.d	8	1.0		sv

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Aqueous Extraction Analysis Sheet

AB 2/2/18

(To Accompany Samples to Instruments)

Batch Number: 320-205981 Analyst: Kolstad, Kate M Batch Open: 1/29/2018 12:23:00PM

Method Code: 320-537_Prep-320 Batch End: 2/1/2018 10:45:00PM

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~320-205981/1 N/A	N/A		250.0 mL	7			N/A	N/A	N/A	CI ND	
				1.0 mL								
2	LLCS~320-205981/2 N/A	N/A		250.0 mL	7			N/A	N/A	N/A	CI ND	
				1.0 mL								
3	LLCSD~320-205981/3 N/A	N/A		250.0 mL	7			N/A	N/A	N/A	CI ND	
				1.0 mL								
4	320-35090-A-1 (537_DOD5)	N/A (320-35090-1)	277.08 g	248.6 mL	7			1/20/18	16_Days	4	CI ND	
			28.46 g	1.0 mL								
5	320-35090-A-2 (537_DOD5)	N/A (320-35090-1)	276.37 g	249.4 mL	7			1/20/18	16_Days	4	CI ND	
			26.94 g	1.0 mL								
6	320-35090-A-3 (537_DOD5)	N/A (320-35090-1)	282.92 g	253.7 mL	7			1/20/18	16_Days	4	CI ND	
			29.23 g	1.0 mL								
7	320-35090-A-4 (537_DOD5)	N/A (320-35090-1)	277.27 g	250.6 mL	7			1/20/18	16_Days	4	CI ND	
			26.69 g	1.0 mL								
8	320-35090-A-5 (537_DOD5)	N/A (320-35090-1)	277.42 g	249 mL	7			1/20/18	16_Days	4	CI ND	
			28.39 g	1.0 mL								
9	320-35090-A-6 (537_DOD5)	N/A (320-35090-1)	280.52 g	253.2 mL	7			1/20/18	16_Days	4	CI ND	
			27.33 g	1.0 mL								
10	320-35090-A-7 (537_DOD5)	N/A (320-35090-1)	274.25 g	245.8 mL	7			1/20/18	16_Days	4	CI ND	
			28.43 g	1.0 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-205981 Analyst: Kolstad, Kate M Batch Open: 1/29/2018 12:23:00PM

Method Code: 320-537_Prep-320 Batch End: 2/1/2018 10:45:00PM

11	320-35090-A-8 (537_DOD5)	N/A (320-35090-1)	277.01 g 26.89 g	250.1 mL 1.0 mL	7			1/20/18	16_Days	4	Cl ND	
12	320-35090-A-9 (537_DOD5)	N/A (320-35090-1)	275.74 g 28.65 g	247.1 mL 1.0 mL	7			1/20/18	16_Days	4	Cl ND	
13	320-35090-A-10 (537_DOD5)	N/A (320-35090-1)	276.83 g 27.93 g	248.9 mL 1.0 mL	7			1/20/18	16_Days	4	Cl ND	
14	320-35090-A-11 (537_DOD5)	N/A (320-35090-1)	277.65 g 27.01 g	250.6 mL 1.0 mL	7			1/20/18	16_Days	4	Cl ND	
15	320-35090-A-12 (537_DOD5)	N/A (320-35090-1)	274.74 g 27.16 g	247.6 mL 1.0 mL	7			1/20/18	16_Days	4	Cl ND	
16	320-35090-A-13 (537_DOD5)	N/A (320-35090-1)	278.86 g 27.32 g	251.5 mL 1.0 mL	7			1/20/18	16_Days	4	Cl ND	
17	320-35090-A-14 (537_DOD5)	N/A (320-35090-1)	273.05 g 27.03 g	246 mL 1.0 mL	7			1/20/18	16_Days	4	Cl ND	
18	320-35090-A-15 (537_DOD5)	N/A (320-35090-1)	277.11 g 26.76 g	250.4 mL 1.0 mL	7			1/20/18	16_Days	4	Cl ND	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-205981 Analyst: Kolstad, Kate M Batch Open: 1/29/2018 12:23:00PM

Method Code: 320-537_Prep-320 Batch End: 2/1/2018 10:45:00PM

Batch Notes

Manifold ID	3, 10
pH Indicator ID	2517
Trizma ID	SLBR4303V
SPE Cartridge ID	6369499-04
Methanol ID	1127839
Reagent Water ID	1-25-18
Internal Standard ID#	1099355
Pipette ID	M16387D
Analyst ID - TA Reagent Drop	JER
Analyst ID - TA Reagent Drop Witness	KMK
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	KMK
Analyst ID - IS Reagent Drop	CCB
Analyst ID - IS Reagent Drop Witness	TWL
Analyst ID - Concentration	KMK/CCB
Analyst ID - Aliquot Step	JER
Analyst ID - Final Volume Step	CCB
Batch Comment	Label ID's checked: KMK 1-29-18

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-205981 | Analyst: Kolstad, Kate M | Batch Open: 1/29/2018 12:23:00PM

Method Code: 320-537_Prep-320 | Batch End:

Batch Notes

Manifold ID	3,10
pH Indicator ID	2517
Trizma ID	SLBR4303V
SPE Cartridge ID	6369499-04
Methanol ID	1127839
Reagent Water ID	1-25-18
Internal Standard ID#	1099355
Pipette ID	M16387D
Analyst ID - TA Reagent Drop	JER
Analyst ID - TA Reagent Drop Witness	KMK
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	KMK
Analyst ID - IS Reagent Drop	CeB
Analyst ID - IS Reagent Drop Witness	TWL
Analyst ID - Concentration	KMK/nights/CeB
Analyst ID - Aliquot Step	JER
Analyst ID - Final Volume Step	CeB
Batch Comment	Label ID's checked: KMK 1-29-18

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-205981 Analyst: Kolstad, Kate M Batch Open: 1/29/2018 12:23:00PM

Method Code: 320-537_Prep-320 Batch End: 2/1/2018 10:45:00PM

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-205981 Analyst: Kolstad, Kate M Batch Open: 1/29/2018 12:23:00PM

Method Code: 320-537_Prep-320 Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-205981/1	LC537-SU_00055	100 uL	1.0 mL	1/29/18	KMK 1-29-18
LLCS 320-205981/2	LC537-LSP_00025	100 uL	1.0 mL		
LLCS 320-205981/2	LC537-SU_00055	100 uL	1.0 mL		
LLCSD 320-205981/3	LC537-LSP_00025	100 uL	1.0 mL		
LLCSD 320-205981/3	LC537-SU_00055	100 uL	1.0 mL		
320-35090-A-1	LC537-SU_00055	100 uL	1.0 mL		
320-35090-A-2	LC537-SU_00055	100 uL	1.0 mL		
320-35090-A-3	LC537-SU_00055	100 uL	1.0 mL		
320-35090-A-4	LC537-SU_00055	100 uL	1.0 mL		
320-35090-A-5	LC537-SU_00055	100 uL	1.0 mL		
320-35090-A-6	LC537-SU_00055	100 uL	1.0 mL		
320-35090-A-7	LC537-SU_00055	100 uL	1.0 mL		
320-35090-A-8	LC537-SU_00055	100 uL	1.0 mL		
320-35090-A-9	LC537-SU_00055	100 uL	1.0 mL		
320-35090-A-10	LC537-SU_00055	100 uL	1.0 mL		
320-35090-A-11	LC537-SU_00055	100 uL	1.0 mL		
320-35090-A-12	LC537-SU_00055	100 uL	1.0 mL		
320-35090-A-13	LC537-SU_00055	100 uL	1.0 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-205981 Analyst: Kolstad, Kate M Batch Open: 1/29/2018 12:23:00PM

Method Code: 320-537_Prep-320 Batch End:

320-35090-A-14	LC537-SU_00055	100 uL	1.0 mL	1/29/18	KMK 1-31-18
320-35090-A-15	LC537-SU_00055	100 uL	1.0 mL	↓	↓

Other Reagents:

Reagent	Amount/Units	Lot#:

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-205981 Analyst: Kolstad, Kate M Batch Open: 1/29/2018 12:23:00PM

Method Code: 320-537_Prep-320 Batch End: 2/1/2018 10:45:00PM

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s) 205981 Test 537

Earliest Holding Time 1-29-18

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	✓	✓
NCM for any anomalies filed	NA	NA
All NCMs include method code, matrix, and prep batch	✓	✓
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 Cl 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: [signature] Date: 2/01/18

2nd Level Reviewer: VPM Date: 2/2/18

Comments: _____

Shipping and Receiving Documents

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-35090-1

Login Number: 35090
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

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

"NAWC-011518-RW-21","537","RES","320-35090-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","7.3","ng/L","J M","6.8","DL","","TRG","","","40","LOQ","YES","-99","","248.6","1.0","16",""
"NAWC-011518-RW-21","537","RES","320-35090-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","11","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","248.6","1.0","8.0",""
"NAWC-011518-RW-21","537","RES","320-35090-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","248.6","1.0","12",""
"NAWC-011518-RW-21","537","RES","320-35090-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U M","16","DL","","TRG","","","91","LOQ","YES","-99","","248.6","1.0","36",""
"NAWC-011518-RW-21","537","RES","320-35090-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.7","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","248.6","1.0","4.0",""
"NAWC-011518-RW-21","537","RES","320-35090-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","248.6","1.0","20",""
"NAWC-011518-RW-21","537","RES","320-35090-1","TALSAC","STL00993","13C2 PFHxA","41","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","40.2","","248.6","1.0","0",""
"NAWC-011518-RW-21","537","RES","320-35090-1","TALSAC","STL00996","13C2 PFDA","42","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","40.2","","248.6","1.0","0",""
"NAWC-011518-RW-213","537","RES","320-35090-10","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","40","ng/L","M","6.8","DL","","TRG","","","40","LOQ","YES","-99","","248.9","1.0","16",""
"NAWC-011518-RW-213","537","RES","320-35090-10","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","24","ng/L","","2.8","DL","","TRG","","","20","LOQ","YES","-99","","248.9","1.0","8.0",""
"NAWC-011518-RW-213","537","RES","320-35090-10","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","7.6","ng/L","J","5.5","DL","","TRG","","","30","LOQ","YES","-99","","248.9","1.0","12",""
"NAWC-011518-RW-213","537","RES","320-35090-10","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","248.9","1.0","36",""
"NAWC-011518-RW-213","537","RES","320-35090-10","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","7.0","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","248.9","1.0","4.0",""
"NAWC-011518-RW-213","537","RES","320-35090-10","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","248.9","1.0","20",""
"NAWC-011518-RW-213","537","RES","320-35090-10","TALSAC","STL00993","13C2 PFHxA","41","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","40.2","","248.9","1.0","0",""
"NAWC-011518-RW-213","537","RES","320-35090-10","TALSAC","STL00996","13C2 PFDA","44","ng/L","","-99","DL","","SURR","110","","-99","LOQ","YES","40.2","","248.9","1.0","0",""
"NAWC-011518-FRB-213","537","RES","320-35090-11","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250.6","1.0","16",""
"NAWC-011518-FRB-213","537","RES","320-35090-11","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250.6","1.0","8.0",""
"NAWC-011518-FRB-213","537","RES","320-35090-11","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250.6","1.0","12",""
"NAWC-011518-FRB-213","537","RES","320-35090-11","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250.6","1.0","36",""
"NAWC-011518-FRB-213","537","RES","320-35090-11","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250.6","1.0","4.0",""
"NAWC-011518-FRB-213","537","RES","320-35090-11","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250.6","1.0","20",""
"NAWC-011518-FRB-213","537","RES","320-35090-11","TALSAC","STL00993","13C2 PFHxA","40","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","39.9","","250.6","1.0","0",""
"NAWC-011518-FRB-213","537","RES","320-35090-11","TALSAC","STL00996","13C2 PFDA","44","ng/L","","-99","DL","","SURR","110","","-99","LOQ","YES","39.9","","250.6","1.0","0",""
"NAWC-011518-RW-215","537","RES","320-35090-12","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","14","ng/L","J M","6.9","DL","","TRG","","","40","LOQ","YES","-99","","247.6","1.0","16",""
"NAWC-011518-RW-215","537","RES","320-35090-12","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","10","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","247.6","1.0","8.1",""
"NAWC-011518-RW-215","537","RES","320-35090-12","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS)","6.7","ng/L","J","5.6","DL","","TRG","","","30","LOQ","YES","-99","","247.6","1.0","12",""
"NAWC-011518-RW-215","537","RES","320-35090-12","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","91","LOQ","YES","-99","","247.6","1.0","36",""
"NAWC-011518-RW-215","537","RES","320-35090-12","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.2","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","247.6","1.0","4.0",""
"NAWC-011518-RW-215","537","RES","320-35090-12","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U M","8.1","DL","","TRG","","","24","LOQ","YES","-99","","247.6","1.0","20",""
"NAWC-011518-RW-215","537","RES","320-35090-12","TALSAC","STL00993","13C2
PFHxA","41","ng/L","","-99","DL","","SURR","101","","-99","LOQ","YES","40.4","","247.6","1.0","0",""
"NAWC-011518-RW-215","537","RES","320-35090-12","TALSAC","STL00996","13C2
PFDA","44","ng/L","","-99","DL","","SURR","109","","-99","LOQ","YES","40.4","","247.6","1.0","0",""
"NAWC-011518-FRB-215","537","RES","320-35090-13","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","251.5","1.0","16",""
"NAWC-011518-FRB-215","537","RES","320-35090-13","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","251.5","1.0","8.0",""
"NAWC-011518-FRB-215","537","RES","320-35090-13","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","251.5","1.0","12",""
"NAWC-011518-FRB-215","537","RES","320-35090-13","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","89","LOQ","YES","-99","","251.5","1.0","36",""
"NAWC-011518-FRB-215","537","RES","320-35090-13","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","9.9","LOQ","YES","-99","","251.5","1.0","4.0",""
"NAWC-011518-FRB-215","537","RES","320-35090-13","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","251.5","1.0","20",""
"NAWC-011518-FRB-215","537","RES","320-35090-13","TALSAC","STL00993","13C2
PFHxA","40","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","39.8","","251.5","1.0","0",""
"NAWC-011518-FRB-215","537","RES","320-35090-13","TALSAC","STL00996","13C2
PFDA","47","ng/L","","-99","DL","","SURR","118","","-99","LOQ","YES","39.8","","251.5","1.0","0",""
"NAWC-011518-RW-48","537","RES","320-35090-14","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U M","6.9","DL","","TRG","","","41","LOQ","YES","-99","","246","1.0","16",""
"NAWC-011518-RW-48","537","RES","320-35090-14","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","6.1","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","246","1.0","8.1",""
"NAWC-011518-RW-48","537","RES","320-35090-14","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.6","DL","","TRG","","","30","LOQ","YES","-99","","246","1.0","12",""
"NAWC-011518-RW-48","537","RES","320-35090-14","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","37","ng/L","U M","16","DL","","TRG","","","91","LOQ","YES","-99","","246","1.0","37",""
"NAWC-011518-RW-48","537","RES","320-35090-14","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","1.9","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","246","1.0","4.1",""
"NAWC-011518-RW-48","537","RES","320-35090-14","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.1","DL","","TRG","","","24","LOQ","YES","-99","","246","1.0","20",""
"NAWC-011518-RW-48","537","RES","320-35090-14","TALSAC","STL00993","13C2
PFHxA","39","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","40.7","","246","1.0","0",""
"NAWC-011518-RW-48","537","RES","320-35090-14","TALSAC","STL00996","13C2
PFDA","43","ng/L","","-99","DL","","SURR","107","","-99","LOQ","YES","40.7","","246","1.0","0",""
"NAWC-011518-FRB-48","537","RES","320-35090-15","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250.4","1.0","16",""
"NAWC-011518-FRB-48","537","RES","320-35090-15","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250.4","1.0","8.0",""
"NAWC-011518-FRB-48","537","RES","320-35090-15","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250.4","1.0","12",""
"NAWC-011518-FRB-48","537","RES","320-35090-15","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250.4","1.0","36",""
"NAWC-011518-FRB-48","537","RES","320-35090-15","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250.4","1.0","4.0",""
"NAWC-011518-FRB-48","537","RES","320-35090-15","TALSAC","375-95-1","Perfluorononanoic acid

(PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250.4","1.0","20",""
"NAWC-011518-FRB-48","537","RES","320-35090-15","TALSAC","STL00993","13C2
PFHxA","43","ng/L","","-99","DL","","SURR","107","","-99","LOQ","YES","39.9","","250.4","1.0","0",""
"NAWC-011518-FRB-48","537","RES","320-35090-15","TALSAC","STL00996","13C2
PFDA","44","ng/L","","-99","DL","","SURR","111","","-99","LOQ","YES","39.9","","250.4","1.0","0",""
"NAWC-011518-FRB-21","537","RES","320-35090-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","249.4","1.0","16",""
"NAWC-011518-FRB-21","537","RES","320-35090-2","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","249.4","1.0","8.0",""
"NAWC-011518-FRB-21","537","RES","320-35090-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","249.4","1.0","12",""
"NAWC-011518-FRB-21","537","RES","320-35090-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","249.4","1.0","36",""
"NAWC-011518-FRB-21","537","RES","320-35090-2","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","249.4","1.0","4.0",""
"NAWC-011518-FRB-21","537","RES","320-35090-2","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","249.4","1.0","20",""
"NAWC-011518-FRB-21","537","RES","320-35090-2","TALSAC","STL00993","13C2
PFHxA","42","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","40.1","","249.4","1.0","0",""
"NAWC-011518-FRB-21","537","RES","320-35090-2","TALSAC","STL00996","13C2
PFDA","44","ng/L","","-99","DL","","SURR","110","","-99","LOQ","YES","40.1","","249.4","1.0","0",""
"NAWC-011518-RW-233","537","RES","320-35090-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","8.1","ng/L","J M","6.7","DL","","TRG","","","39","LOQ","YES","-99","","253.7","1.0","16",""
"NAWC-011518-RW-233","537","RES","320-35090-3","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","11","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","253.7","1.0","7.9",""
"NAWC-011518-RW-233","537","RES","320-35090-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.4","DL","","TRG","","","30","LOQ","YES","-99","","253.7","1.0","12",""
"NAWC-011518-RW-233","537","RES","320-35090-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","35","ng/L","U M","16","DL","","TRG","","","89","LOQ","YES","-99","","253.7","1.0","35",""
"NAWC-011518-RW-233","537","RES","320-35090-3","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","6.0","ng/L","J","1.9","DL","","TRG","","","9.9","LOQ","YES","-99","","253.7","1.0","3.9",""
"NAWC-011518-RW-233","537","RES","320-35090-3","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U M","7.9","DL","","TRG","","","24","LOQ","YES","-99","","253.7","1.0","20",""
"NAWC-011518-RW-233","537","RES","320-35090-3","TALSAC","STL00993","13C2
PFHxA","38","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","39.4","","253.7","1.0","0",""
"NAWC-011518-RW-233","537","RES","320-35090-3","TALSAC","STL00996","13C2
PFDA","39","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","39.4","","253.7","1.0","0",""
"NAWC-011518-FRB-233","537","RES","320-35090-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250.6","1.0","16",""
"NAWC-011518-FRB-233","537","RES","320-35090-4","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250.6","1.0","8.0",""
"NAWC-011518-FRB-233","537","RES","320-35090-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250.6","1.0","12",""
"NAWC-011518-FRB-233","537","RES","320-35090-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250.6","1.0","36",""
"NAWC-011518-FRB-233","537","RES","320-35090-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250.6","1.0","4.0",""
"NAWC-011518-FRB-233","537","RES","320-35090-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250.6","1.0","20",""
"NAWC-011518-FRB-233","537","RES","320-35090-4","TALSAC","STL00993","13C2
PFHxA","42","ng/L","","-99","DL","","SURR","106","","-99","LOQ","YES","39.9","","250.6","1.0","0",""
"NAWC-011518-FRB-233","537","RES","320-35090-4","TALSAC","STL00996","13C2
PFDA","42","ng/L","","-99","DL","","SURR","106","","-99","LOQ","YES","39.9","","250.6","1.0","0",""
"NAWC-011518-RW-241","537","RES","320-35090-5","TALSAC","1763-23-1","Perfluorooctanesulfonic acid

(PFOS)","16","ng/L","J M","6.8","DL","","TRG","","","40","LOQ","YES","-99","","249","1.0","16",""
"NAWC-011518-RW-241","537","RES","320-35090-5","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","13","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","249","1.0","8.0",""
"NAWC-011518-RW-241","537","RES","320-35090-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","7.1","ng/L","J","5.5","DL","","TRG","","","30","LOQ","YES","-99","","249","1.0","12",""
"NAWC-011518-RW-241","537","RES","320-35090-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","249","1.0","36",""
"NAWC-011518-RW-241","537","RES","320-35090-5","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.7","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","249","1.0","4.0",""
"NAWC-011518-RW-241","537","RES","320-35090-5","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U M","8.0","DL","","TRG","","","24","LOQ","YES","-99","","249","1.0","20",""
"NAWC-011518-RW-241","537","RES","320-35090-5","TALSAC","STL00993","13C2
PFHxA","41","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","40.2","","249","1.0","0",""
"NAWC-011518-RW-241","537","RES","320-35090-5","TALSAC","STL00996","13C2
PFDA","43","ng/L","","-99","DL","","SURR","107","","-99","LOQ","YES","40.2","","249","1.0","0",""
"NAWC-011518-FRB-241","537","RES","320-35090-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.7","DL","","TRG","","","39","LOQ","YES","-99","","253.2","1.0","16",""
"NAWC-011518-FRB-241","537","RES","320-35090-6","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","7.9","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","253.2","1.0","7.9",""
"NAWC-011518-FRB-241","537","RES","320-35090-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.4","DL","","TRG","","","30","LOQ","YES","-99","","253.2","1.0","12",""
"NAWC-011518-FRB-241","537","RES","320-35090-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","89","LOQ","YES","-99","","253.2","1.0","36",""
"NAWC-011518-FRB-241","537","RES","320-35090-6","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.9","ng/L","U","1.9","DL","","TRG","","","9.9","LOQ","YES","-99","","253.2","1.0","3.9",""
"NAWC-011518-FRB-241","537","RES","320-35090-6","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","7.9","DL","","TRG","","","24","LOQ","YES","-99","","253.2","1.0","20",""
"NAWC-011518-FRB-241","537","RES","320-35090-6","TALSAC","STL00993","13C2
PFHxA","40","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","39.5","","253.2","1.0","0",""
"NAWC-011518-FRB-241","537","RES","320-35090-6","TALSAC","STL00996","13C2
PFDA","46","ng/L","","-99","DL","","SURR","117","","-99","LOQ","YES","39.5","","253.2","1.0","0",""
"WGNA-011518-RW-3385","537","RES","320-35090-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","15","ng/L","J M","6.9","DL","","TRG","","","41","LOQ","YES","-99","","245.8","1.0","16",""
"WGNA-011518-RW-3385","537","RES","320-35090-7","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","14","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","245.8","1.0","8.1",""
"WGNA-011518-RW-3385","537","RES","320-35090-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.6","DL","","TRG","","","31","LOQ","YES","-99","","245.8","1.0","12",""
"WGNA-011518-RW-3385","537","RES","320-35090-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","37","ng/L","U M","16","DL","","TRG","","","92","LOQ","YES","-99","","245.8","1.0","37",""
"WGNA-011518-RW-3385","537","RES","320-35090-7","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.5","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","245.8","1.0","4.1",""
"WGNA-011518-RW-3385","537","RES","320-35090-7","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U M","8.1","DL","","TRG","","","24","LOQ","YES","-99","","245.8","1.0","20",""
"WGNA-011518-RW-3385","537","RES","320-35090-7","TALSAC","STL00993","13C2
PFHxA","43","ng/L","","-99","DL","","SURR","106","","-99","LOQ","YES","40.7","","245.8","1.0","0",""
"WGNA-011518-RW-3385","537","RES","320-35090-7","TALSAC","STL00996","13C2
PFDA","43","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","40.7","","245.8","1.0","0",""
"WGNA-011518-FRB-3385","537","RES","320-35090-8","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250.1","1.0","16",""
"WGNA-011518-FRB-3385","537","RES","320-35090-8","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250.1","1.0","8.0",""
"WGNA-011518-FRB-3385","537","RES","320-35090-8","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250.1","1.0","12",""
"WGNA-011518-FRB-3385","537","RES","320-35090-8","TALSAC","375-73-5","Perfluorobutanesulfonic acid

(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250.1","1.0","36",""
"WGNA-011518-FRB-3385","537","RES","320-35090-8","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250.1","1.0","4.0",""
"WGNA-011518-FRB-3385","537","RES","320-35090-8","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250.1","1.0","20",""
"WGNA-011518-FRB-3385","537","RES","320-35090-8","TALSAC","STL00993","13C2
PFHxA","41","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","40.0","","250.1","1.0","0",""
"WGNA-011518-FRB-3385","537","RES","320-35090-8","TALSAC","STL00996","13C2
PFDA","39","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","40.0","","250.1","1.0","0",""
"WGNA-011518-DUP19","537","RES","320-35090-9","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","J M","6.9","DL","","TRG","","","40","LOQ","YES","-99","","247.1","1.0","16",""
"WGNA-011518-DUP19","537","RES","320-35090-9","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","14","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","247.1","1.0","8.1",""
"WGNA-011518-DUP19","537","RES","320-35090-9","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.6","DL","","TRG","","","30","LOQ","YES","-99","","247.1","1.0","12",""
"WGNA-011518-DUP19","537","RES","320-35090-9","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","91","LOQ","YES","-99","","247.1","1.0","36",""
"WGNA-011518-DUP19","537","RES","320-35090-9","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.5","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","247.1","1.0","4.0",""
"WGNA-011518-DUP19","537","RES","320-35090-9","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U M","8.1","DL","","TRG","","","24","LOQ","YES","-99","","247.1","1.0","20",""
"WGNA-011518-DUP19","537","RES","320-35090-9","TALSAC","STL00993","13C2
PFHxA","42","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","40.5","","247.1","1.0","0",""
"WGNA-011518-DUP19","537","RES","320-35090-9","TALSAC","STL00996","13C2
PFDA","45","ng/L","","-99","DL","","SURR","110","","-99","LOQ","YES","40.5","","247.1","1.0","0",""
"LLCS 320-205981/2-A","537","RES","LLCS 320-205981/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic
acid (PFOS)","41.0","ng/L","M","6.8","DL","","SPK","102","","40","LOQ","YES","40.0","","250.0","1.0","16",""
"LLCS 320-205981/2-A","537","RES","LLCS 320-205981/2-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","21.1","ng/L","","2.8","DL","","SPK","105","","20","LOQ","YES","20.0","","250.0","1.0","8.0",""
"LLCS 320-205981/2-A","537","RES","LLCS 320-205981/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","33.4","ng/L","","5.5","DL","","SPK","111","","30","LOQ","YES","30.0","","250.0","1.0","12",""
"LLCS 320-205981/2-A","537","RES","LLCS 320-205981/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","99.0","ng/L","","16","DL","","SPK","110","","90","LOQ","YES","90.0","","250.0","1.0","36",""
"LLCS 320-205981/2-A","537","RES","LLCS 320-205981/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","11.3","ng/L","","1.9","DL","","SPK","113","","10","LOQ","YES","10.0","","250.0","1.0","4.0",""
"LLCS 320-205981/2-A","537","RES","LLCS 320-205981/2-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20.9","ng/L","J","8.0","DL","","SPK","105","","24","LOQ","YES","20.0","","250.0","1.0","20",""
"LLCS 320-205981/2-A","537","RES","LLCS 320-205981/2-A","TALSAC","STL00993","13C2
PFHxA","42.8","ng/L","","-99","DL","","SURR","107","","-99","LOQ","YES","40.0","","250.0","1.0","0",""
"LLCS 320-205981/2-A","537","RES","LLCS 320-205981/2-A","TALSAC","STL00996","13C2
PFDA","45.3","ng/L","","-99","DL","","SURR","113","","-99","LOQ","YES","40.0","","250.0","1.0","0",""
"LLCSD 320-205981/3-A","537","RES","LLCSD 320-205981/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic
acid (PFOS)","39.4","ng/L","J M","6.8","DL","","SPK","98","4","40","LOQ","YES","40.0","LLCS 320-205981/2-
A","250.0","1.0","16",""
"LLCSD 320-205981/3-A","537","RES","LLCSD 320-205981/3-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","20.8","ng/L","","2.8","DL","","SPK","104","2","20","LOQ","YES","20.0","LLCS 320-205981/2-
A","250.0","1.0","8.0",""
"LLCSD 320-205981/3-A","537","RES","LLCSD 320-205981/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic
acid (PFHxS)","31.9","ng/L","","5.5","DL","","SPK","106","5","30","LOQ","YES","30.0","LLCS 320-205981/2-
A","250.0","1.0","12",""
"LLCSD 320-205981/3-A","537","RES","LLCSD 320-205981/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic
acid (PFBS)","91.9","ng/L","","16","DL","","SPK","102","7","90","LOQ","YES","90.0","LLCS 320-205981/2-
A","250.0","1.0","36",""
"LLCSD 320-205981/3-A","537","RES","LLCSD 320-205981/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid

(PFHpA)","11.2","ng/L","","1.9","DL","","SPK","112","1","10","LOQ","YES","10.0","LLCS 320-205981/2-A","250.0","1.0","4.0",""
"LLCSD 320-205981/3-A","537","RES","LLCSD 320-205981/3-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20.6","ng/L","J","8.0","DL","","SPK","103","2","24","LOQ","YES","20.0","LLCS 320-205981/2-A","250.0","1.0","20",""
"LLCSD 320-205981/3-A","537","RES","LLCSD 320-205981/3-A","TALSAC","STL00993","13C2 PFHxA","44.2","ng/L","","-99","DL","","SURR","110","3","-99","LOQ","YES","40.0","LLCS 320-205981/2-A","250.0","1.0","0",""
"LLCSD 320-205981/3-A","537","RES","LLCSD 320-205981/3-A","TALSAC","STL00996","13C2 PFDA","46.1","ng/L","","-99","DL","","SURR","115","2","-99","LOQ","YES","40.0","LLCS 320-205981/2-A","250.0","1.0","0",""
"MB 320-205981/1-A","537","RES","MB 320-205981/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250.0","1.0","16",""
"MB 320-205981/1-A","537","RES","MB 320-205981/1-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250.0","1.0","8.0",""
"MB 320-205981/1-A","537","RES","MB 320-205981/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250.0","1.0","12",""
"MB 320-205981/1-A","537","RES","MB 320-205981/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250.0","1.0","36",""
"MB 320-205981/1-A","537","RES","MB 320-205981/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250.0","1.0","4.0",""
"MB 320-205981/1-A","537","RES","MB 320-205981/1-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250.0","1.0","20",""
"MB 320-205981/1-A","537","RES","MB 320-205981/1-A","TALSAC","STL00993","13C2 PFHxA","41.9","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","40.0","","250.0","1.0","0",""
"MB 320-205981/1-A","537","RES","MB 320-205981/1-A","TALSAC","STL00996","13C2 PFDA","45.4","ng/L","","-99","DL","","SURR","113","","-99","LOQ","YES","40.0","","250.0","1.0","0",""
"Unknown","Unknown","NAWC-011518-RW-21","01/15/2018 08:10","AQ","320-35090-1","NM","","3.00","537","METHOD","RES","01/29/2018 12:24","02/02/2018 14:47","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-206761","320-35090-1","01/16/2018 10:15","01/17/2018 10:15",""
"Unknown","Unknown","NAWC-011518-RW-213","01/15/2018 10:10","AQ","320-35090-10","NM","","3.00","537","METHOD","RES","01/29/2018 12:24","02/02/2018 15:38","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-206762","320-35090-1","01/16/2018 10:15","01/17/2018 10:15",""
"Unknown","Unknown","NAWC-011518-FRB-213","01/15/2018 10:05","AQ","320-35090-11","FB","","3.00","537","METHOD","RES","01/29/2018 12:24","02/02/2018 15:43","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-206762","320-35090-1","01/16/2018 10:15","01/17/2018 10:15",""
"Unknown","Unknown","NAWC-011518-RW-215","01/15/2018 12:10","AQ","320-35090-12","NM","","3.00","537","METHOD","RES","01/29/2018 12:24","02/02/2018 15:48","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-206762","320-35090-1","01/16/2018 10:15","01/17/2018 10:15",""
"Unknown","Unknown","NAWC-011518-FRB-215","01/15/2018 12:05","AQ","320-35090-13","FB","","3.00","537","METHOD","RES","01/29/2018 12:24","02/02/2018 15:53","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-206762","320-35090-1","01/16/2018 10:15","01/17/2018 10:15",""
"Unknown","Unknown","NAWC-011518-RW-48","01/15/2018 13:10","AQ","320-35090-14","NM","","3.00","537","METHOD","RES","01/29/2018 12:24","02/02/2018 15:57","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-206762","320-35090-1","01/16/2018 10:15","01/17/2018 10:15",""
"Unknown","Unknown","NAWC-011518-FRB-48","01/15/2018 13:05","AQ","320-35090-15","FB","","3.00","537","METHOD","RES","01/29/2018 12:24","02/02/2018 16:02","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-

206762","320-35090-1","01/16/2018 10:15","01/17/2018 10:15",""
"Unknown","Unknown","NAWC-011518-FRB-21","01/15/2018 08:05","AQ","320-35090-
2","FB","","3.00","537","METHOD","RES","01/29/2018 12:24","02/02/2018
14:52","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-
206761","320-35090-1","01/16/2018 10:15","01/17/2018 10:15",""
"Unknown","Unknown","NAWC-011518-RW-233","01/15/2018 08:40","AQ","320-35090-
3","NM","","3.00","537","METHOD","RES","01/29/2018 12:24","02/02/2018
14:56","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-
206761","320-35090-1","01/16/2018 10:15","01/17/2018 10:15",""
"Unknown","Unknown","NAWC-011518-FRB-233","01/15/2018 08:35","AQ","320-35090-
4","FB","","3.00","537","METHOD","RES","01/29/2018 12:24","02/02/2018
15:01","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-
206761","320-35090-1","01/16/2018 10:15","01/17/2018 10:15",""
"Unknown","Unknown","NAWC-011518-RW-241","01/15/2018 09:10","AQ","320-35090-
5","NM","","3.00","537","METHOD","RES","01/29/2018 12:24","02/02/2018
15:06","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-
206761","320-35090-1","01/16/2018 10:15","01/17/2018 10:15",""
"Unknown","Unknown","NAWC-011518-FRB-241","01/15/2018 09:05","AQ","320-35090-
6","FB","","3.00","537","METHOD","RES","01/29/2018 12:24","02/02/2018
15:20","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-
206762","320-35090-1","01/16/2018 10:15","01/17/2018 10:15",""
"Unknown","Unknown","WGNA-011518-RW-3385","01/15/2018 09:40","AQ","320-35090-
7","NM","","3.00","537","METHOD","RES","01/29/2018 12:24","02/02/2018
15:24","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-
206762","320-35090-1","01/16/2018 10:15","01/17/2018 10:15",""
"Unknown","Unknown","WGNA-011518-FRB-3385","01/15/2018 09:35","AQ","320-35090-
8","FB","","3.00","537","METHOD","RES","01/29/2018 12:24","02/02/2018
15:29","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-
206762","320-35090-1","01/16/2018 10:15","01/17/2018 10:15",""
"Unknown","Unknown","WGNA-011518-DUP19","01/15/2018 07:00","AQ","320-35090-
9","FD","","3.00","537","METHOD","RES","01/29/2018 12:24","02/02/2018
15:34","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-
206762","320-35090-1","01/16/2018 10:15","01/17/2018 10:15",""
"Unknown","Unknown","LLCS 320-205981/2-A","","AQ","LLCS 320-205981/2-
A","LCS","","-99","537","METHOD","RES","01/29/2018 12:24","02/02/2018
14:38","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-
206761","320-35090-1","01/29/2018 12:24","01/17/2018 10:15",""
"Unknown","Unknown","LLCSD 320-205981/3-A","","AQ","LLCSD 320-205981/3-
A","LCSD","","-99","537","METHOD","RES","01/29/2018 12:24","02/02/2018
14:42","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-
206761","320-35090-1","01/29/2018 12:24","01/17/2018 10:15",""
"Unknown","Unknown","MB 320-205981/1-A","","AQ","MB 320-205981/1-
A","MB","","-99","537","METHOD","RES","01/29/2018 12:24","02/02/2018
14:33","TALSAC","COA","WET","NA","1","NA","NA","","100","320-205981","320-205981","NA","320-
206761","320-35090-1","01/29/2018 12:24","01/17/2018 10:15",""

TETRA TECH

INTERNAL CORRESPONDENCE

TO: **A. FREBOWITZ** **DATE:** **FEBRUARY 8, 2018**

FROM: **TERRI L. SOLOMON** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)**
NAS JRB WILLOW GROVE
SAMPLE DELIVERY GROUP (SDG) 320-35090-1

SAMPLES: 7/Field Reagent Blank (FRB)

NAWC-011518-FRB-221	NAWC-011518-FRB-233
NAWC-011518-FRB-241	WGNA-011518-FRB-3385
NAWC-011518-FRB-213	NAWC-011518-FRB-215
NAWC-011518-FRB-48	

8/Drinking Water

NAWC-011518-RW-221	NAWC-011518-RW-233
NAWC-011518-RW-241	WGNA-011518-RW-3385
WGNA-011518-DUP19	NAWC-011518-RW-213
NAWC-011518-RW-215	NAWC-011518-RW-48

Overview

The sample set for NAS JRB Willow Grove, SDG 320-35090-1, consisted of eight (8) drinking water samples and seven (7) 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). One (1) field duplicate sample pair (WGNA-011518-RW-3385 / WGNA-011518-DUP19) was included in this SDG.

The samples were collected by Tetra Tech on January 15, 2018 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, field 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

Detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated, (J).

Notes

A sample ID on the chain of custody was listed as NAWC-011518-RW-221. The laboratory listed the sample as NAWC-011518-RW-21. Both samples were collected on 01/15/2018 @ 8:10. The validator corrected the sample ID to match the chain of custody.

A sample ID on the chain of custody was listed as NAWC-011518-FRB-221. The laboratory listed the sample as NAWC-011518-FRB-21. Both samples were collected on 01/15/2018 @ 8:05. The validator corrected the sample ID to match the chain of custody.

Samples with detections and their associated FRBs are summarized below. No detected results were present in the FRBs.

Sample	**Associated FRB**
NAWC-011518-RW-221	NAWC-011518-FRB-221
NAWC-011518-RW-233	NAWC-011518-FRB-233
NAWC-011518-RW-241	NAWC-011518-FRB-241
WGNA-011518-RW-3385	WGNA-011518-FRB-3385
WGNA-011518-DUP19	WGNA-011518-FRB-3385
NAWC-011518-RW-213	NAWC-011518-FRB-213
NAWC-011518-RW-215	NAWC-011518-FRB-215
NAWC-011518-RW-48	NAWC-011518-FRB-48

Non-detected results were reported to the Limit of Detection (LOD).

The buffering agent Trizma was added to all drinking water samples.

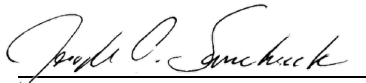
Executive Summary

Laboratory Performance: No issues.

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-011518-FRB-213			NAWC-011518-FRB-215			NAWC-011518-FRB-221			NAWC-011518-FRB-233		
SDG: 320-35090-1	LAB_ID	320-35090-11			320-35090-13			320-35090-2			320-35090-4		
FRACTION: PFAS	SAMP_DATE	1/15/2018			1/15/2018			1/15/2018			1/15/2018		
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	U		8	U		8	U		8	U	
PERFLUOROBUTANESULFONIC ACID		36	U		36	U		36	U		36	U	
PERFLUOROHEPTANOIC ACID		4	U		4	U		4	U		4	U	
PERFLUOROHEXANESULFONIC ACID		12	U		12	U		12	U		12	U	
PERFLUORONONANOIC ACID		20	U		20	U		20	U		20	U	
PERFLUOROOCTANE SULFONIC ACID		16	U		16	U		16	U		16	U	

PROJ_NO: 08005-WE04	NSAMPLE	NAWC-011518-FRB-241			NAWC-011518-FRB-48			NAWC-011518-RW-213			NAWC-011518-RW-215		
SDG: 320-35090-1	LAB_ID	320-35090-6			320-35090-15			320-35090-10			320-35090-12		
FRACTION: PFAS	SAMP_DATE	1/15/2018			1/15/2018			1/15/2018			1/15/2018		
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	U		24			10	J	P
PERFLUOROBUTANESULFONIC ACID		36	U		36	U		36	U		36	U	
PERFLUOROHEPTANOIC ACID		3.9	U		4	U		7	J	P	3.2	J	P
PERFLUOROHEXANESULFONIC ACID		12	U		12	U		7.6	J	P	6.7	J	P
PERFLUORONONANOIC ACID		20	U		20	U		20	U		20	U	
PERFLUOROOCTANE SULFONIC ACID		16	U		16	U		40			14	J	P

PROJ_NO: 08005-WE04	NSAMPLE	NAWC-011518-RW-221			NAWC-011518-RW-233			NAWC-011518-RW-241			NAWC-011518-RW-48		
SDG: 320-35090-1	LAB_ID	320-35090-1			320-35090-3			320-35090-5			320-35090-14		
FRACTION: PFAS	SAMP_DATE	1/15/2018			1/15/2018			1/15/2018			1/15/2018		
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		11	J	P	11	J	P	13	J	P	6.1	J	P
PERFLUOROBUTANESULFONIC ACID		36	U		35	U		36	U		37	U	
PERFLUOROHEPTANOIC ACID		4.7	J	P	6	J	P	4.7	J	P	1.9	J	P
PERFLUOROHEXANESULFONIC ACID		12	U		12	U		7.1	J	P	12	U	
PERFLUORONONANOIC ACID		20	U		20	U		20	U		20	U	
PERFLUOROOCTANE SULFONIC ACID		7.3	J	P	8.1	J	P	16	J	P	16	U	

PROJ_NO: 08005-WE04	NSAMPLE	WGNA-011518-DUP19			WGNA-011518-FRB-3385			WGNA-011518-RW-3385		
SDG: 320-35090-1	LAB_ID	320-35090-9			320-35090-8			320-35090-7		
FRACTION: PFAS	SAMP_DATE	1/15/2018			1/15/2018			1/15/2018		
MEDIA: WATER	QC_TYPE	FD			FB			NM		
	UNITS	NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF	WGNA-011518-RW-3385								
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		14	J	P	8	U		14	J	P
PERFLUOROBUTANESULFONIC ACID		36	U		36	U		37	U	
PERFLUOROHEPTANOIC ACID		4.5	J	P	4	U		4.5	J	P
PERFLUOROHEXANESULFONIC ACID		12	U		12	U		12	U	
PERFLUORONONANOIC ACID		20	U		20	U		20	U	
PERFLUOROOCTANE SULFONIC ACID		16	J	P	16	U		15	J	P

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LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-~~21~~ 221 | Lab Sample ID: 320-35090-1

Matrix: Water | Lab File ID: 2018.02.02_537A_012.d

Analysis Method: 537 | Date Collected: 01/15/2018 08:10

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 248.6(mL) | Date Analyzed: 02/02/2018 14:47

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

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

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

Analysis Batch No.: 206761 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	7.3	J ~~M~~	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	11	J	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)	4.7	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U ~~M~~	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		70-130
STL00996	13C2 PFDA	105		70-130

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FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-~~21~~ 221 | Lab Sample ID: 320-35090-2

Matrix: Water | Lab File ID: 2018.02.02_537A_013.d

Analysis Method: 537 | Date Collected: 01/15/2018 08:05

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 249.4(mL) | Date Analyzed: 02/02/2018 14:52

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

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

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

Analysis Batch No.: 206761 | 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	105		70-130
STL00996	13C2 PFDA	110		70-130

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LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-233 | Lab Sample ID: 320-35090-3

Matrix: Water | Lab File ID: 2018.02.02_537A_014.d

Analysis Method: 537 | Date Collected: 01/15/2018 08:40

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 253.7(mL) | Date Analyzed: 02/02/2018 14:56

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

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

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

Analysis Batch No.: 206761 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	8.1	J ~~M~~	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	11	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U ~~M~~	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.0	J	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U ~~M~~	89	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	99		70-130

Toni L Salomon
02/08/2018

FORM I
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Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-233 | Lab Sample ID: 320-35090-4

Matrix: Water | Lab File ID: 2018.02.02_537A_015.d

Analysis Method: 537 | Date Collected: 01/15/2018 08:35

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 250.6(mL) | Date Analyzed: 02/02/2018 15:01

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

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

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

Analysis Batch No.: 206761 | 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	106		70-130
STL00996	13C2 PFDA	106		70-130

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Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-241 | Lab Sample ID: 320-35090-5

Matrix: Water | Lab File ID: 2018.02.02_537A_016.d

Analysis Method: 537 | Date Collected: 01/15/2018 09:10

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 249(mL) | Date Analyzed: 02/02/2018 15:06

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

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

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

Analysis Batch No.: 206761 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	J ~~M~~	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	13	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)	7.1	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	103		70-130
STL00996	13C2 PFDA	107		70-130

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LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-241 | Lab Sample ID: 320-35090-6

Matrix: Water | Lab File ID: 2018.02.02_537A_019.d

Analysis Method: 537 | Date Collected: 01/15/2018 09:05

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 253.2(mL) | Date Analyzed: 02/02/2018 15:20

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	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)	3.9	U	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		70-130
STL00996	13C2 PFDA	117		70-130

Toni L Salomon

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LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: WGNA-011518-RW-3385 | Lab Sample ID: 320-35090-7

Matrix: Water | Lab File ID: 2018.02.02_537A_020.d

Analysis Method: 537 | Date Collected: 01/15/2018 09:40

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 245.8(mL) | Date Analyzed: 02/02/2018 15:24

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	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)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U ~~M~~	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	106		70-130
STL00996	13C2 PFDA	105		70-130

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Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: WGNA-011518-FRB-3385 | Lab Sample ID: 320-35090-8

Matrix: Water | Lab File ID: 2018.02.02_537A_021.d

Analysis Method: 537 | Date Collected: 01/15/2018 09:35

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 250.1(mL) | Date Analyzed: 02/02/2018 15:29

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

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

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

Analysis Batch No.: 206762 | 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	102		70-130
STL00996	13C2 PFDA	98		70-130

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Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: WGNA-011518-DUP19 | Lab Sample ID: 320-35090-9

Matrix: Water | Lab File ID: 2018.02.02_537A_022.d

Analysis Method: 537 | Date Collected: 01/15/2018 07:00

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 247.1(mL) | Date Analyzed: 02/02/2018 15:34

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	J ~~M~~	40	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)	12	U	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5	J	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	103		70-130
STL00996	13C2 PFDA	110		70-130

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LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-213 | Lab Sample ID: 320-35090-10

Matrix: Water | Lab File ID: 2018.02.02_537A_023.d

Analysis Method: 537 | Date Collected: 01/15/2018 10:10

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 248.9(mL) | Date Analyzed: 02/02/2018 15:38

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	40	~~M~~	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	24		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.6	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.0	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	102		70-130
STL00996	13C2 PFDA	110		70-130

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LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-213 | Lab Sample ID: 320-35090-11

Matrix: Water | Lab File ID: 2018.02.02_537A_024.d

Analysis Method: 537 | Date Collected: 01/15/2018 10:05

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 250.6(mL) | Date Analyzed: 02/02/2018 15:43

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

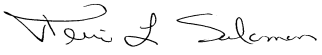
Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 206762 | 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	100		70-130
STL00996	13C2 PFDA	110		70-130



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LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-215 | Lab Sample ID: 320-35090-12

Matrix: Water | Lab File ID: 2018.02.02_537A_025.d

Analysis Method: 537 | Date Collected: 01/15/2018 12:10

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 247.6(mL) | Date Analyzed: 02/02/2018 15:48

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	J ~~M~~	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	10	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)	6.7	J	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.2	J	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	101		70-130
STL00996	13C2 PFDA	109		70-130

Dawn L Salerno
02/08/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-215 | Lab Sample ID: 320-35090-13

Matrix: Water | Lab File ID: 2018.02.02_537A_026.d

Analysis Method: 537 | Date Collected: 01/15/2018 12:05

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 251.5(mL) | Date Analyzed: 02/02/2018 15:53

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

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

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

Analysis Batch No.: 206762 | 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	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	100		70-130
STL00996	13C2 PFDA	118		70-130

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LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-48 | Lab Sample ID: 320-35090-14

Matrix: Water | Lab File ID: 2018.02.02_537A_027.d

Analysis Method: 537 | Date Collected: 01/15/2018 13:10

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 246(mL) | Date Analyzed: 02/02/2018 15:57

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U ~~M~~	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	6.1	J	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)	1.9	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U ~~M~~	91	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	107		70-130

Marie L Salemen
02/08/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-48 | Lab Sample ID: 320-35090-15

Matrix: Water | Lab File ID: 2018.02.02_537A_028.d

Analysis Method: 537 | Date Collected: 01/15/2018 13:05

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 250.4(mL) | Date Analyzed: 02/02/2018 16:02

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

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

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

Analysis Batch No.: 206762 | 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	107		70-130
STL00996	13C2 PFDA	111		70-130

02/08/2018

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-~~21~~ 221 | Lab Sample ID: 320-35090-1

Matrix: Water | Lab File ID: 2018.02.02_537A_012.d

Analysis Method: 537 | Date Collected: 01/15/2018 08:10

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 248.6(mL) | Date Analyzed: 02/02/2018 14:47

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

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

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

Analysis Batch No.: 206761 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	7.3	J M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	11	J	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)	4.7	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U M	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		70-130
STL00996	13C2 PFDA	105		70-130

02/08/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-~~21~~ 221 | Lab Sample ID: 320-35090-2

Matrix: Water | Lab File ID: 2018.02.02_537A_013.d

Analysis Method: 537 | Date Collected: 01/15/2018 08:05

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 249.4(mL) | Date Analyzed: 02/02/2018 14:52

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

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

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

Analysis Batch No.: 206761 | 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	105		70-130
STL00996	13C2 PFDA	110		70-130

02/08/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-233 | Lab Sample ID: 320-35090-3

Matrix: Water | Lab File ID: 2018.02.02_537A_014.d

Analysis Method: 537 | Date Collected: 01/15/2018 08:40

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 253.7(mL) | Date Analyzed: 02/02/2018 14:56

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

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

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

Analysis Batch No.: 206761 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	8.1	J M	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	11	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.0	J	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U M	89	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	99		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-233 | Lab Sample ID: 320-35090-4

Matrix: Water | Lab File ID: 2018.02.02_537A_015.d

Analysis Method: 537 | Date Collected: 01/15/2018 08:35

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 250.6(mL) | Date Analyzed: 02/02/2018 15:01

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

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

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

Analysis Batch No.: 206761 | 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	106		70-130
STL00996	13C2 PFDA	106		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-241 | Lab Sample ID: 320-35090-5

Matrix: Water | Lab File ID: 2018.02.02_537A_016.d

Analysis Method: 537 | Date Collected: 01/15/2018 09:10

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 249(mL) | Date Analyzed: 02/02/2018 15:06

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

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

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

Analysis Batch No.: 206761 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	J M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	13	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)	7.1	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	103		70-130
STL00996	13C2 PFDA	107		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-241 | Lab Sample ID: 320-35090-6

Matrix: Water | Lab File ID: 2018.02.02_537A_019.d

Analysis Method: 537 | Date Collected: 01/15/2018 09:05

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 253.2(mL) | Date Analyzed: 02/02/2018 15:20

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	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)	3.9	U	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		70-130
STL00996	13C2 PFDA	117		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: WGNA-011518-RW-3385 | Lab Sample ID: 320-35090-7

Matrix: Water | Lab File ID: 2018.02.02_537A_020.d

Analysis Method: 537 | Date Collected: 01/15/2018 09:40

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 245.8(mL) | Date Analyzed: 02/02/2018 15:24

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	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)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U M	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	106		70-130
STL00996	13C2 PFDA	105		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: WGNA-011518-FRB-3385 | Lab Sample ID: 320-35090-8

Matrix: Water | Lab File ID: 2018.02.02_537A_021.d

Analysis Method: 537 | Date Collected: 01/15/2018 09:35

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 250.1(mL) | Date Analyzed: 02/02/2018 15:29

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

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

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

Analysis Batch No.: 206762 | 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	102		70-130
STL00996	13C2 PFDA	98		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: WGNA-011518-DUP19 | Lab Sample ID: 320-35090-9

Matrix: Water | Lab File ID: 2018.02.02_537A_022.d

Analysis Method: 537 | Date Collected: 01/15/2018 07:00

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 247.1(mL) | Date Analyzed: 02/02/2018 15:34

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	J M	40	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)	12	U	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5	J	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	103		70-130
STL00996	13C2 PFDA	110		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-213 | Lab Sample ID: 320-35090-10

Matrix: Water | Lab File ID: 2018.02.02_537A_023.d

Analysis Method: 537 | Date Collected: 01/15/2018 10:10

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 248.9(mL) | Date Analyzed: 02/02/2018 15:38

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	40	M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	24		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.6	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.0	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	102		70-130
STL00996	13C2 PFDA	110		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-213 | Lab Sample ID: 320-35090-11

Matrix: Water | Lab File ID: 2018.02.02_537A_024.d

Analysis Method: 537 | Date Collected: 01/15/2018 10:05

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 250.6(mL) | Date Analyzed: 02/02/2018 15:43

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

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

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

Analysis Batch No.: 206762 | 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	100		70-130
STL00996	13C2 PFDA	110		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-215 | Lab Sample ID: 320-35090-12

Matrix: Water | Lab File ID: 2018.02.02_537A_025.d

Analysis Method: 537 | Date Collected: 01/15/2018 12:10

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 247.6(mL) | Date Analyzed: 02/02/2018 15:48

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	J M	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	10	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)	6.7	J	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.2	J	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	101		70-130
STL00996	13C2 PFDA	109		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-215 | Lab Sample ID: 320-35090-13

Matrix: Water | Lab File ID: 2018.02.02_537A_026.d

Analysis Method: 537 | Date Collected: 01/15/2018 12:05

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 251.5(mL) | Date Analyzed: 02/02/2018 15:53

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

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

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

Analysis Batch No.: 206762 | 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	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	100		70-130
STL00996	13C2 PFDA	118		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-RW-48 | Lab Sample ID: 320-35090-14

Matrix: Water | Lab File ID: 2018.02.02_537A_027.d

Analysis Method: 537 | Date Collected: 01/15/2018 13:10

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 246(mL) | Date Analyzed: 02/02/2018 15:57

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

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

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

Analysis Batch No.: 206762 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U M	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	6.1	J	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)	1.9	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U M	91	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	107		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: NAWC-011518-FRB-48 | Lab Sample ID: 320-35090-15

Matrix: Water | Lab File ID: 2018.02.02_537A_028.d

Analysis Method: 537 | Date Collected: 01/15/2018 13:05

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 250.4(mL) | Date Analyzed: 02/02/2018 16:02

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

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

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

Analysis Batch No.: 206762 | 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	107		70-130
STL00996	13C2 PFDA	111		70-130

Appendix C

Support Documentation

ANALYTE	ORIGINAL 011518-RW-3385	DUPLICATE 011518-DUP19	RL	RPD	RPD > 50%	ORIGINAL SAMPLE CONC >5xRL	DUPLICATE SAMPLE CONC >5xRL	DIFFERENCE >2XRL
Perfluorooctanoic acid (PFOA)	14	14	20	0	FALSE	FALSE	FALSE	FALSE
Perfluoroheptanoic acid (PFHpA)	4.5	4.5	10	0	FALSE	FALSE	FALSE	FALSE
Perfluorooctanesulfonic acid (PFOS)	15	16	41	6.45	FALSE	FALSE	FALSE	FALSE

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: 1/15/2018	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			

320-35090 Chain of Custody

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-011518-RW-221	1/15/2018	08:10	G	DW	2	N	N	Y	
NAWC-011518-FRB-221	1/15/2018	08:05	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-011518-RW-233	1/15/2018	08:40	G	DW	2	N	N	Y	
NAWC-011518-FRB-233	1/15/2018	08:35	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-011518-RW-241	1/15/2018	09:10	G	DW	2	N	N	Y	
NAWC-011518-FRB-241	1/15/2018	09:05	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-011518-RW-3385	1/15/2018	09:40	G	DW	2	N	N	Y	
WGNA-011518-FRB-3385	1/15/2018	09:35	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-011518-DUP19	1/15/2018	07:00	G	DW	2	N	N	Y	DUPLICATE
NAWC-011518-RW-213	1/15/2018	10:10	G	DW	2	N	N	Y	
NAWC-011518-FRB-213	1/15/2018	10:05	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-011518-RW-215	1/15/2018	12:10	G	DW	2	N	N	Y	
NAWC-011518-FRB-215	1/15/2018	12:05	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-011518-RW-48	1/15/2018	13:10	G	DW	2	N	N	Y	
NAWC-011518-FRB-48	1/15/2018	13:05	G	DW	2	N	N	Y	Field Reagent Blank
								6	

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

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the

☑ 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: 7712 1891 3335

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd: 3.0	Corr'd:	Therm ID No.: NA43
Relinquished by:	Company: Tetra Tech	Date/Time: 1/15/2018 16:00	Received by:	Company: FedEx	Date/Time: 1/16/18 1015
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.11, dated 1/24/2017

Job Narrative
320-35090-1

Receipt
The samples were received on 1/16/2018 10:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.0º C.

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.

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

Organic Prep
Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-205981.

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

Sample Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-35090-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-35090-1	NAWC-011518-RW-21	Water	01/15/18 08:10	01/16/18 10:15
320-35090-2	NAWC-011518-FRB-21	Water	01/15/18 08:05	01/16/18 10:15
320-35090-3	NAWC-011518-RW-233	Water	01/15/18 08:40	01/16/18 10:15
320-35090-4	NAWC-011518-FRB-233	Water	01/15/18 08:35	01/16/18 10:15
320-35090-5	NAWC-011518-RW-241	Water	01/15/18 09:10	01/16/18 10:15
320-35090-6	NAWC-011518-FRB-241	Water	01/15/18 09:05	01/16/18 10:15
320-35090-7	WGNA-011518-RW-3385	Water	01/15/18 09:40	01/16/18 10:15
320-35090-8	WGNA-011518-FRB-3385	Water	01/15/18 09:35	01/16/18 10:15
320-35090-9	WGNA-011518-DUP19	Water	01/15/18 07:00	01/16/18 10:15
320-35090-10	NAWC-011518-RW-213	Water	01/15/18 10:10	01/16/18 10:15
320-35090-11	NAWC-011518-FRB-213	Water	01/15/18 10:05	01/16/18 10:15
320-35090-12	NAWC-011518-RW-215	Water	01/15/18 12:10	01/16/18 10:15
320-35090-13	NAWC-011518-FRB-215	Water	01/15/18 12:05	01/16/18 10:15
320-35090-14	NAWC-011518-RW-48	Water	01/15/18 13:10	01/16/18 10:15
320-35090-15	NAWC-011518-FRB-48	Water	01/15/18 13:05	01/16/18 10:15

Method Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-35090-1
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

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-011518-RW-21	320-35090-1	103	105
NAWC-011518-FRB-21	320-35090-2	105	110
NAWC-011518-RW-233	320-35090-3	97	99
NAWC-011518-FRB-233	320-35090-4	106	106
NAWC-011518-RW-241	320-35090-5	103	107
NAWC-011518-FRB-241	320-35090-6	103	117
WGNA-011518-RW-3385	320-35090-7	106	105
WGNA-011518-FRB-3385	320-35090-8	102	98
WGNA-011518-DUP19	320-35090-9	103	110
NAWC-011518-RW-213	320-35090-10	102	110
NAWC-011518-FRB-213	320-35090-11	100	110
NAWC-011518-RW-215	320-35090-12	101	109
NAWC-011518-FRB-215	320-35090-13	100	118
NAWC-011518-RW-48	320-35090-14	96	107
NAWC-011518-FRB-48	320-35090-15	107	111
	MB 320-205981/1-A	105	113
	LLCS 320-205981/2-A	107	113
	LLCSD 320-205981/3-A	110	115

	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 LOW LEVEL CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.02.02_537A_010.d

Lab ID: LLCS 320-205981/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LLCS CONCENTRATION (ng/L)	LLCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	40.0	41.0	102	50-150	M
Perfluorooctanoic acid (PFOA)	20.0	21.1	105	50-150	
Perfluorononanoic acid (PFNA)	20.0	20.9 J	105	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.0	33.4	111	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	11.3	113	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.0	99.0	110	50-150	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LOW LEVEL CONTROL STANDARD DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.02.02_537A_011.d

Lab ID: LLCSD 320-205981/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LLCSD CONCENTRATION (ng/L)	LLCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	40.0	39.4 J	98	4	50	50-150	M
Perfluorooctanoic acid (PFOA)	20.0	20.8	104	2	50	50-150	
Perfluorononanoic acid (PFNA)	20.0	20.6 J	103	2	50	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.0	31.9	106	5	50	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	11.2	112	1	50	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.0	91.9	102	7	50	50-150	

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.: 320-35090-1

SDG No.:

Lab File ID: 2018.02.02_537A_009.d Lab Sample ID: MB 320-205981/1-A

Matrix: Water Date Extracted: 01/29/2018 12:24

Instrument ID: A8_N Date Analyzed: 02/02/2018 14:33

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LLCS 320-205981/2-A	2018.02.02_537A_010.d	02/02/2018 14:38
	LLCSD 320-205981/3-A	2018.02.02_537A_011.d	02/02/2018 14:42
NAWC-011518-RW-21	320-35090-1	2018.02.02_537A_012.d	02/02/2018 14:47
NAWC-011518-FRB-21	320-35090-2	2018.02.02_537A_013.d	02/02/2018 14:52
NAWC-011518-RW-233	320-35090-3	2018.02.02_537A_014.d	02/02/2018 14:56
NAWC-011518-FRB-233	320-35090-4	2018.02.02_537A_015.d	02/02/2018 15:01
NAWC-011518-RW-241	320-35090-5	2018.02.02_537A_016.d	02/02/2018 15:06
NAWC-011518-FRB-241	320-35090-6	2018.02.02_537A_019.d	02/02/2018 15:20
WGNA-011518-RW-3385	320-35090-7	2018.02.02_537A_020.d	02/02/2018 15:24
WGNA-011518-FRB-3385	320-35090-8	2018.02.02_537A_021.d	02/02/2018 15:29
WGNA-011518-DUP19	320-35090-9	2018.02.02_537A_022.d	02/02/2018 15:34
NAWC-011518-RW-213	320-35090-10	2018.02.02_537A_023.d	02/02/2018 15:38
NAWC-011518-FRB-213	320-35090-11	2018.02.02_537A_024.d	02/02/2018 15:43
NAWC-011518-RW-215	320-35090-12	2018.02.02_537A_025.d	02/02/2018 15:48
NAWC-011518-FRB-215	320-35090-13	2018.02.02_537A_026.d	02/02/2018 15:53
NAWC-011518-RW-48	320-35090-14	2018.02.02_537A_027.d	02/02/2018 15:57
NAWC-011518-FRB-48	320-35090-15	2018.02.02_537A_028.d	02/02/2018 16:02

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35090-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-205981/1-A

Matrix: Water | Lab File ID: 2018.02.02_537A_009.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 01/29/2018 12:24

Sample wt/vol: 250.0(mL) | Date Analyzed: 02/02/2018 14:33

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

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

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

Analysis Batch No.: 206761 | 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	105		70-130
STL00996	13C2 PFDA	113		70-130

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

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 320-206761/1		1655390	1.87	3269547	2.12		
CCV 320-206761/2 CCVIS		1656526	1.86	3231012	2.12		
MB 320-205981/1-A		1333051	1.85	3005290	2.11		
LLCS 320-205981/2-A		1347572	1.84	3064104	2.10		
LLCSD 320-205981/3-A		1334476	1.84	3061885	2.09		
320-35090-1	NAWC-011518-RW-21	1402398	1.84	3002549	2.10		
320-35090-2	NAWC-011518-FRB-21	1400952	1.84	3069663	2.09		
320-35090-3	NAWC-011518-RW-233	1517070	1.84	3154398	2.09		
320-35090-4	NAWC-011518-FRB-233	1379723	1.84	3086428	2.09		
320-35090-5	NAWC-011518-RW-241	1413224	1.84	3132065	2.09		
CCV 320-206761/14 CCVIS		1553440	1.84	3198528	2.09		
CCV 320-206762/14 CCVIS		1553440	1.84	3198528	2.09		
320-35090-6	NAWC-011518-FRB-241	1381690	1.84	3202154	2.09		
320-35090-7	WGNA-011518-RW-3385	1395726	1.83	3215283	2.09		
320-35090-8	WGNA-011518-FRB-3385	1471505	1.83	3214406	2.09		
320-35090-9	WGNA-011518-DUP19	1425511	1.84	3169341	2.09		
320-35090-10	NAWC-011518-RW-213	1399237	1.83	3165894	2.09		
320-35090-11	NAWC-011518-FRB-213	1477701	1.84	3257549	2.09		
320-35090-12	NAWC-011518-RW-215	1445838	1.84	3081289	2.09		
320-35090-13	NAWC-011518-FRB-215	1398357	1.83	3172443	2.08		
320-35090-14	NAWC-011518-RW-48	1453041	1.83	3202843	2.08		
320-35090-15	NAWC-011518-FRB-48	1416442	1.83	3166785	2.09		
CCV 320-206762/26 CCVIS		1462471	1.83	3102658	2.08		

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.: 320-35090-1

SDG No.:

Sample No.: CCV 320-206761/2 Date Analyzed: 02/02/2018 14:14

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

Lab File ID (Standard): 2018.02.02_537A_005 Heated Purge: (Y/N) N

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1656526	1.86	3231012	2.12		
UPPER LIMIT		2319136	2.36	4523417	2.62		
LOWER LIMIT		1159568	1.36	2261708	1.62		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-205981/1-A		1333051	1.85	3005290	2.11		
LLCS 320-205981/2-A		1347572	1.84	3064104	2.10		
LLCSD 320-205981/3-A		1334476	1.84	3061885	2.09		
320-35090-1	NAWC-011518-RW-21	1402398	1.84	3002549	2.10		
320-35090-2	NAWC-011518-FRB-21	1400952	1.84	3069663	2.09		
320-35090-3	NAWC-011518-RW-233	1517070	1.84	3154398	2.09		
320-35090-4	NAWC-011518-FRB-233	1379723	1.84	3086428	2.09		
320-35090-5	NAWC-011518-RW-241	1413224	1.84	3132065	2.09		

13PFOA = 13C2-PFOA
13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS
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.: 320-35090-1

SDG No.:

Sample No.: CCV 320-206761/14 Date Analyzed: 02/02/2018 15:10

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

Lab File ID (Standard): 2018.02.02_537A_017 Heated Purge: (Y/N) N

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1553440	1.84	3198528	2.09		
UPPER LIMIT		2174816	2.34	4477939	2.59		
LOWER LIMIT		1087408	1.34	2238970	1.59		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-205981/1-A		1333051	1.85	3005290	2.11		
LLCS 320-205981/2-A		1347572	1.84	3064104	2.10		
LLCSD 320-205981/3-A		1334476	1.84	3061885	2.09		
320-35090-1	NAWC-011518-RW-21	1402398	1.84	3002549	2.10		
320-35090-2	NAWC-011518-FRB-21	1400952	1.84	3069663	2.09		
320-35090-3	NAWC-011518-RW-233	1517070	1.84	3154398	2.09		
320-35090-4	NAWC-011518-FRB-233	1379723	1.84	3086428	2.09		
320-35090-5	NAWC-011518-RW-241	1413224	1.84	3132065	2.09		

13PFOA = 13C2-PFOA
13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS
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.: 320-35090-1

SDG No.:

Sample No.: CCV 320-206762/14 Date Analyzed: 02/02/2018 15:10

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

Lab File ID (Standard): 2018.02.02_537A_017 Heated Purge: (Y/N) N

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1553440	1.84	3198528	2.09		
UPPER LIMIT		2174816	2.34	4477939	2.59		
LOWER LIMIT		1087408	1.34	2238970	1.59		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-35090-6	NAWC-011518-FRB-241	1381690	1.84	3202154	2.09		
320-35090-7	WGNA-011518-RW-3385	1395726	1.83	3215283	2.09		
320-35090-8	WGNA-011518-FRB-3385	1471505	1.83	3214406	2.09		
320-35090-9	WGNA-011518-DUP19	1425511	1.84	3169341	2.09		
320-35090-10	NAWC-011518-RW-213	1399237	1.83	3165894	2.09		
320-35090-11	NAWC-011518-FRB-213	1477701	1.84	3257549	2.09		
320-35090-12	NAWC-011518-RW-215	1445838	1.84	3081289	2.09		
320-35090-13	NAWC-011518-FRB-215	1398357	1.83	3172443	2.08		
320-35090-14	NAWC-011518-RW-48	1453041	1.83	3202843	2.08		
320-35090-15	NAWC-011518-FRB-48	1416442	1.83	3166785	2.09		

13PFOA = 13C2-PFOA
13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS
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.: 320-35090-1

SDG No.:

Sample No.: CCV 320-206762/26 Date Analyzed: 02/02/2018 16:07

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

Lab File ID (Standard): 2018.02.02_537A_029 Heated Purge: (Y/N) N

Calibration ID: 36012

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1462471	1.83	3102658	2.08		
UPPER LIMIT		2047459	2.33	4343721	2.58		
LOWER LIMIT		1023730	1.33	2171861	1.58		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-35090-6	NAWC-011518-FRB-241	1381690	1.84	3202154	2.09		
320-35090-7	WGNA-011518-RW-3385	1395726	1.83	3215283	2.09		
320-35090-8	WGNA-011518-FRB-3385	1471505	1.83	3214406	2.09		
320-35090-9	WGNA-011518-DUP19	1425511	1.84	3169341	2.09		
320-35090-10	NAWC-011518-RW-213	1399237	1.83	3165894	2.09		
320-35090-11	NAWC-011518-FRB-213	1477701	1.84	3257549	2.09		
320-35090-12	NAWC-011518-RW-215	1445838	1.84	3081289	2.09		
320-35090-13	NAWC-011518-FRB-215	1398357	1.83	3172443	2.08		
320-35090-14	NAWC-011518-RW-48	1453041	1.83	3202843	2.08		
320-35090-15	NAWC-011518-FRB-48	1416442	1.83	3166785	2.09		

13PFOA = 13C2-PFOA
13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS
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.: 320-35090-1 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.: 320-35090-1 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.: 320-35090-1 Analy Batch No.: 192908

SDG No.:

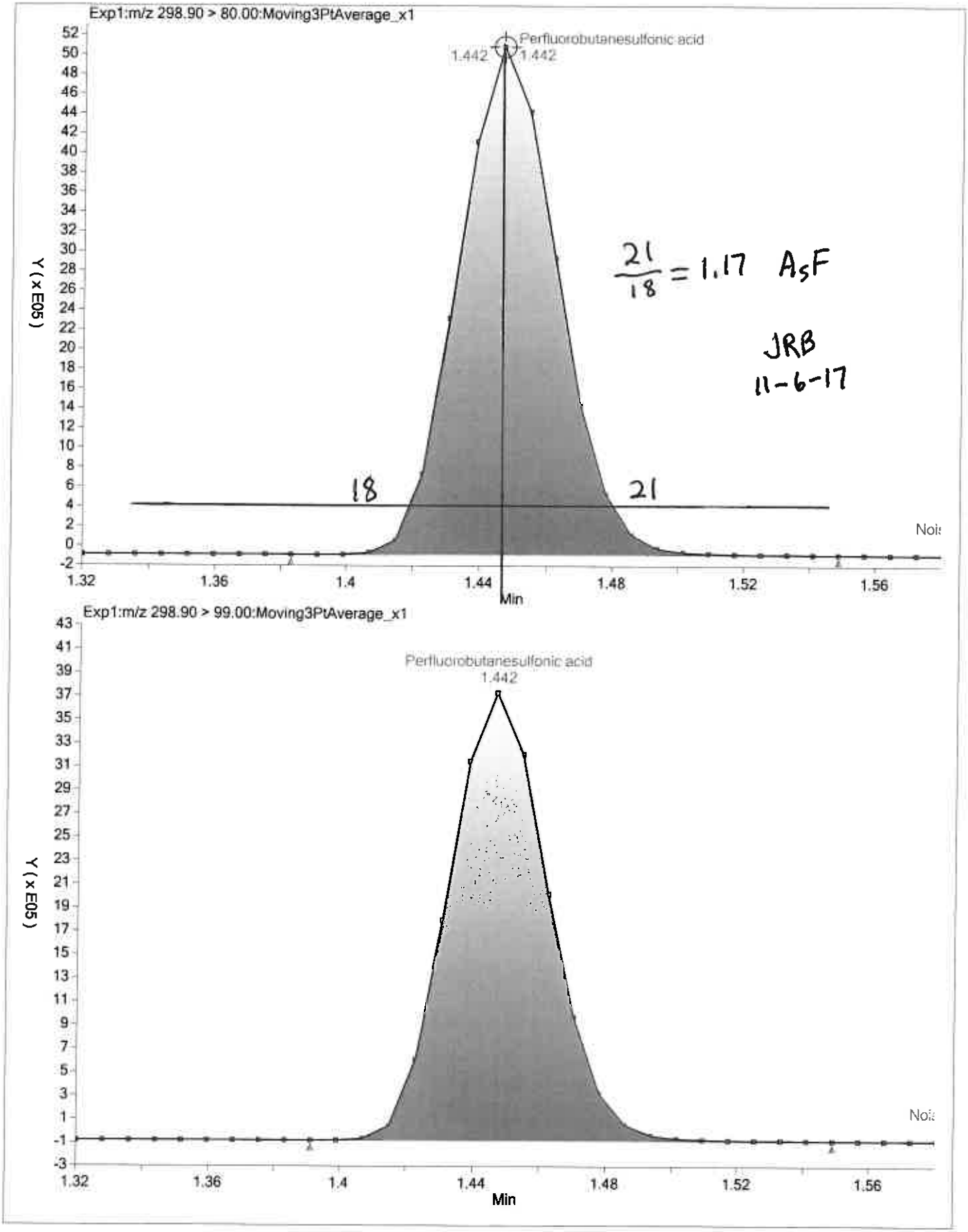
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

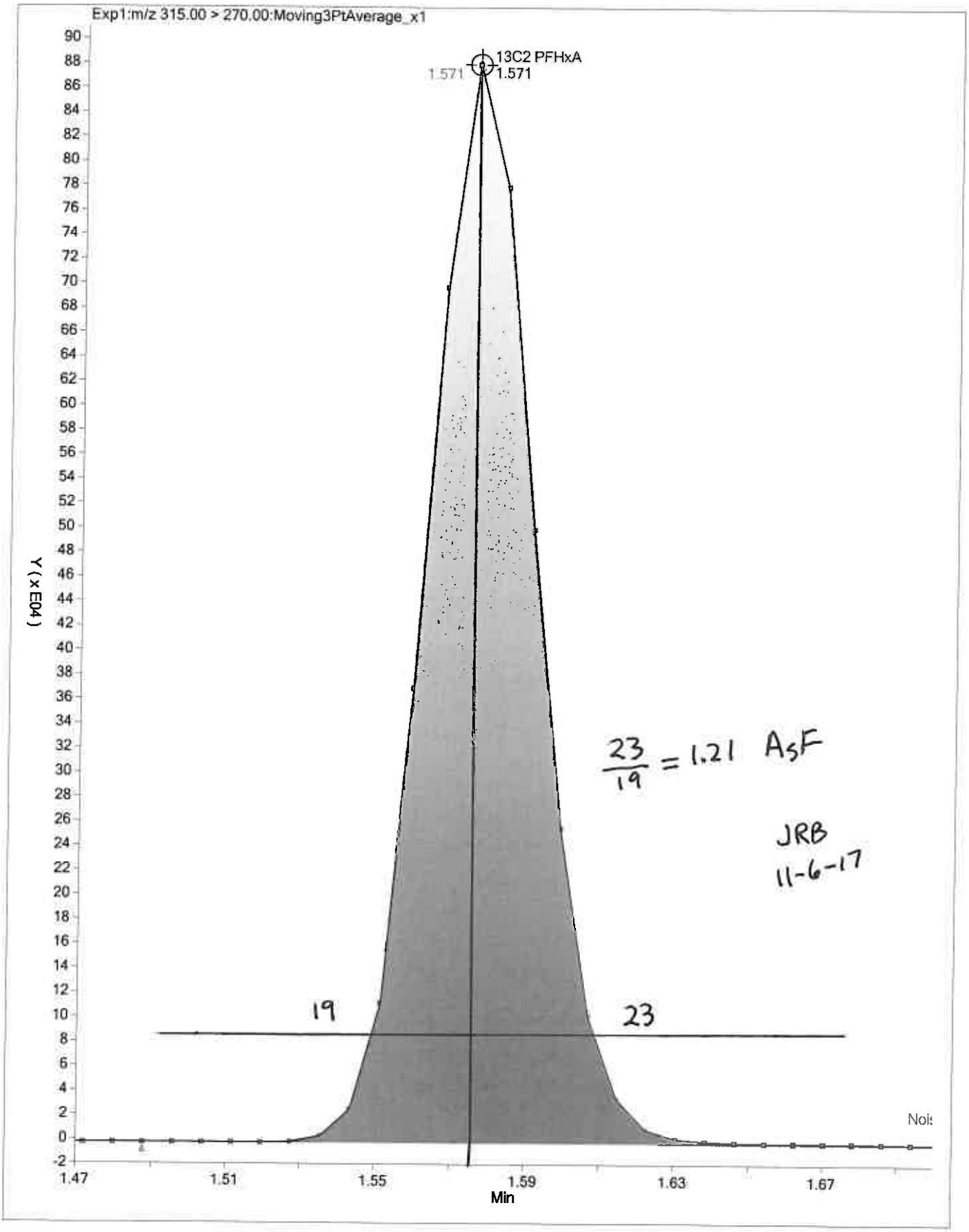
Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

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


Exp1:m/z 298.90 > 80.00:Moving3PtAverage_x1
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.: 320-35090-1

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.: 320-35090-1

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.: 320-35090-1

SDG No.:

Lab Sample ID: CCVL 320-206761/1 Calibration Date: 02/02/2018 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: 2018.02.02_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		1.107		20.3	20.0	1.7	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.8361		1.98	2.22	-10.8	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.674		6.67	6.67	-0.0	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9188		4.41	4.45	-0.8	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9385		8.89	8.89	-0.0	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.5870		3.93	4.45	-11.6	50.0
13C2 PFHxA	Ave	1.100	0.9771		8.88	10.0	-11.2	30.0
13C2 PFDA	Ave	0.7652	0.7354		9.61	10.0	-3.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Lab Sample ID: CCV 320-206761/2 Calibration Date: 02/02/2018 14:14

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: 2018.02.02_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		0.9248		136	135	1.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.8035		12.9	15.0	-14.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.651		44.4	45.0	-1.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9191		29.8	30.0	-0.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9295		59.4	60.0	-1.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6017		27.2	30.0	-9.4	30.0
13C2 PFHxA	Ave	1.100	0.9839		8.94	10.0	-10.6	30.0
13C2 PFDA	Ave	0.7652	0.7424		9.70	10.0	-3.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Lab Sample ID: CCV 320-206761/14 Calibration Date: 02/02/2018 15:10

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: 2018.02.02_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		1.076		46.1	45.0	2.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.8627		4.60	5.00	-7.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.659		14.9	15.0	-0.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8783		9.49	10.0	-5.1	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.8799		18.7	20.0	-6.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.5963		8.98	10.0	-10.2	30.0
13C2 PFHxA	Ave	1.100	1.054		9.58	10.0	-4.2	30.0
13C2 PFDA	Ave	0.7652	0.7349		9.60	10.0	-4.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Lab Sample ID: CCV 320-206762/14 Calibration Date: 02/02/2018 15:10

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: 2018.02.02_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		1.076		46.1	45.0	2.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.8627		4.60	5.00	-7.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.659		14.9	15.0	-0.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8783		9.49	10.0	-5.1	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.8799		18.7	20.0	-6.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.5963		8.98	10.0	-10.2	30.0
13C2 PFHxA	Ave	1.100	1.054		9.58	10.0	-4.2	30.0
13C2 PFDA	Ave	0.7652	0.7349		9.60	10.0	-4.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Lab Sample ID: CCV 320-206762/26 Calibration Date: 02/02/2018 16:07

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: 2018.02.02_537A_029.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.9496		141	135	4.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9328		14.9	15.0	-0.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.719		46.2	45.0	2.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9519		30.9	30.0	2.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9365		59.9	60.0	-0.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6257		28.3	30.0	-5.8	30.0
13C2 PFHxA	Ave	1.100	1.137		10.3	10.0	3.4	30.0
13C2 PFDA	Ave	0.7652	0.7804		10.2	10.0	2.0	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

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.: 320-35090-1

SDG No.:

Instrument ID: A8_N Start Date: 02/02/2018 14:10

Analysis Batch Number: 206761 End Date: 02/02/2018 15:10

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-206761/1		02/02/2018 14:10	1	2018.02.02_537A_004.d	GeminiC18 3x100 3(mm)
CCV 320-206761/2 CCVIS		02/02/2018 14:14	1	2018.02.02_537A_005.d	GeminiC18 3x100 3(mm)
MB 320-205981/1-A		02/02/2018 14:33	1	2018.02.02_537A_009.d	GeminiC18 3x100 3(mm)
LLCS 320-205981/2-A		02/02/2018 14:38	1	2018.02.02_537A_010.d	GeminiC18 3x100 3(mm)
LLCSD 320-205981/3-A		02/02/2018 14:42	1	2018.02.02_537A_011.d	GeminiC18 3x100 3(mm)
320-35090-1		02/02/2018 14:47	1	2018.02.02_537A_012.d	GeminiC18 3x100 3(mm)
320-35090-2		02/02/2018 14:52	1	2018.02.02_537A_013.d	GeminiC18 3x100 3(mm)
320-35090-3		02/02/2018 14:56	1	2018.02.02_537A_014.d	GeminiC18 3x100 3(mm)
320-35090-4		02/02/2018 15:01	1	2018.02.02_537A_015.d	GeminiC18 3x100 3(mm)
320-35090-5		02/02/2018 15:06	1	2018.02.02_537A_016.d	GeminiC18 3x100 3(mm)
CCV 320-206761/14 CCVIS		02/02/2018 15:10	1	2018.02.02_537A_017.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Instrument ID: A8_N Start Date: 02/02/2018 15:10

Analysis Batch Number: 206762 End Date: 02/02/2018 16:07

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-206762/14 CCVIS		02/02/2018 15:10	1	2018.02.02_537A 017.d	GeminiC18 3x100 3(mm)
320-35090-6		02/02/2018 15:20	1	2018.02.02_537A 019.d	GeminiC18 3x100 3(mm)
320-35090-7		02/02/2018 15:24	1	2018.02.02_537A 020.d	GeminiC18 3x100 3(mm)
320-35090-8		02/02/2018 15:29	1	2018.02.02_537A 021.d	GeminiC18 3x100 3(mm)
320-35090-9		02/02/2018 15:34	1	2018.02.02_537A 022.d	GeminiC18 3x100 3(mm)
320-35090-10		02/02/2018 15:38	1	2018.02.02_537A 023.d	GeminiC18 3x100 3(mm)
320-35090-11		02/02/2018 15:43	1	2018.02.02_537A 024.d	GeminiC18 3x100 3(mm)
320-35090-12		02/02/2018 15:48	1	2018.02.02_537A 025.d	GeminiC18 3x100 3(mm)
320-35090-13		02/02/2018 15:53	1	2018.02.02_537A 026.d	GeminiC18 3x100 3(mm)
320-35090-14		02/02/2018 15:57	1	2018.02.02_537A 027.d	GeminiC18 3x100 3(mm)
320-35090-15		02/02/2018 16:02	1	2018.02.02_537A 028.d	GeminiC18 3x100 3(mm)
CCV 320-206762/26 CCVIS		02/02/2018 16:07	1	2018.02.02_537A 029.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35090-1

SDG No.:

Batch Number: 205981 Batch Start Date: 01/29/18 12:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 02/01/18 22:45

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00055
MB 320-205981/1		537, 537				250.0 mL	1.0 mL	7 SU	100 uL
LLCS 320-205981/2		537, 537				250.0 mL	1.0 mL	7 SU	100 uL
LLCSD 320-205981/3		537, 537				250.0 mL	1.0 mL	7 SU	100 uL
320-35090-A-1	NAWC-011518-RW-21	537, 537	T	277.08 g	28.46 g	248.6 mL	1.0 mL	7 SU	100 uL
320-35090-A-2	NAWC-011518-FRB-21	537, 537	T	276.37 g	26.94 g	249.4 mL	1.0 mL	7 SU	100 uL
320-35090-A-3	NAWC-011518-RW-233	537, 537	T	282.92 g	29.23 g	253.7 mL	1.0 mL	7 SU	100 uL
320-35090-A-4	NAWC-011518-FRB-233	537, 537	T	277.27 g	26.69 g	250.6 mL	1.0 mL	7 SU	100 uL
320-35090-A-5	NAWC-011518-RW-241	537, 537	T	277.42 g	28.39 g	249 mL	1.0 mL	7 SU	100 uL
320-35090-A-6	NAWC-011518-FRB-241	537, 537	T	280.52 g	27.33 g	253.2 mL	1.0 mL	7 SU	100 uL
320-35090-A-7	WGNA-011518-RW-3385	537, 537	T	274.25 g	28.43 g	245.8 mL	1.0 mL	7 SU	100 uL
320-35090-A-8	WGNA-011518-FRB-3385	537, 537	T	277.01 g	26.89 g	250.1 mL	1.0 mL	7 SU	100 uL
320-35090-A-9	WGNA-011518-DUP19	537, 537	T	275.74 g	28.65 g	247.1 mL	1.0 mL	7 SU	100 uL
320-35090-A-10	NAWC-011518-RW-213	537, 537	T	276.83 g	27.93 g	248.9 mL	1.0 mL	7 SU	100 uL
320-35090-A-11	NAWC-011518-FRB-213	537, 537	T	277.65 g	27.01 g	250.6 mL	1.0 mL	7 SU	100 uL
320-35090-A-12	NAWC-011518-RW-215	537, 537	T	274.74 g	27.16 g	247.6 mL	1.0 mL	7 SU	100 uL
320-35090-A-13	NAWC-011518-FRB-215	537, 537	T	278.86 g	27.32 g	251.5 mL	1.0 mL	7 SU	100 uL
320-35090-A-14	NAWC-011518-RW-48	537, 537	T	273.05 g	27.03 g	246 mL	1.0 mL	7 SU	100 uL
320-35090-A-15	NAWC-011518-FRB-48	537, 537	T	277.11 g	26.76 g	250.4 mL	1.0 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-LSP 00025	LC537-SU 00055	AnalysisComment			
MB 320-205981/1		537, 537			100 uL	Cl ND			
LLCS 320-205981/2		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.: 320-35090-1

SDG No.:

Batch Number: 205981 Batch Start Date: 01/29/18 12:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 02/01/18 22:45

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-LSP 00025	LC537-SU 00055	AnalysisComment			
LLCSD 320-205981/3		537, 537		100 uL	100 uL	Cl ND			
320-35090-A-1	NAWC-011518-RW-21	537, 537	T		100 uL	Cl ND			
320-35090-A-2	NAWC-011518-FRB-21	537, 537	T		100 uL	Cl ND			
320-35090-A-3	NAWC-011518-RW-233	537, 537	T		100 uL	Cl ND			
320-35090-A-4	NAWC-011518-FRB-233	537, 537	T		100 uL	Cl ND			
320-35090-A-5	NAWC-011518-RW-241	537, 537	T		100 uL	Cl ND			
320-35090-A-6	NAWC-011518-FRB-241	537, 537	T		100 uL	Cl ND			
320-35090-A-7	WGNA-011518-RW-3385	537, 537	T		100 uL	Cl ND			
320-35090-A-8	WGNA-011518-FRB-3385	537, 537	T		100 uL	Cl ND			
320-35090-A-9	WGNA-011518-DUP19	537, 537	T		100 uL	Cl ND			
320-35090-A-10	NAWC-011518-RW-213	537, 537	T		100 uL	Cl ND			
320-35090-A-11	NAWC-011518-FRB-213	537, 537	T		100 uL	Cl ND			
320-35090-A-12	NAWC-011518-RW-215	537, 537	T		100 uL	Cl ND			
320-35090-A-13	NAWC-011518-FRB-215	537, 537	T		100 uL	Cl ND			
320-35090-A-14	NAWC-011518-RW-48	537, 537	T		100 uL	Cl ND			
320-35090-A-15	NAWC-011518-FRB-48	537, 537	T		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.: 320-35090-1

SDG No.:

Batch Number: 205981 Batch Start Date: 01/29/18 12:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 02/01/18 22:45

Batch Notes	
Analyst ID - Aliquot Step	JER
Batch Comment	Label ID's checked: KMK 1-29-18
Analyst ID - Concentration	KMK/CCB
Analyst ID - Final Volume Step	CCB
Internal Standard ID#	1099355
Manifold ID	3, 10
Methanol ID	1127839
pH Indicator ID	2517
Pipette ID	M16387D
Analyst ID - IS Reagent Drop	CCB
Analyst ID - IS Reagent Drop Witness	TWL
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	KMK
Analyst ID - TA Reagent Drop	JER
Analyst ID - TA Reagent Drop Witness	KMK
SPE Cartridge ID	6369499-04
Trizma ID	SLBR4303V
Reagent Water ID	1-25-18

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.

PFAS Calibration Calculations:

Initial Calibration 11/3/2017
Instrument A8_N

PFOS

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
4	412315	3298877	28.7	0.89678	0.8958
8.89	985487	3450592	28.7	0.92201	0.9213
20	2067792	3194016	28.7	0.92901	0.9281
40	4363079	3374600	28.7	0.92767	0.9268
60	6504279	3199479	28.7	0.97241	0.9715
80	8679676	3141787	28.7	0.99110	0.9902
			Average	0.93983	0.9389
			Standard Deviation	0.0350	
			RSD	0.0372	
			%RSD	3.72448	3.7

Continuing Calibration 02/02/2018 @ 14:14
Instrument A8_N

PFOS

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
60	6284377	3231012	28.7	0.9304	-0.908828	0.9295	-1

Willow Grove
SDG 320-35090-1

Sample Identification	NAWC-011518-RW-21	
Compound	Perfluorooctanesulfonic acid	
Compound Area	178443	
Internal Standard Amount (ng)	28.7	
Dilution Factor	1	
Internal Standard Area	3002549	
Average RRF	0.9389	
Sample Volume(L)	0.2486	
Volume Extract (ml)	1	
Injection Volume (µl)	1	
Concentration	7.3075	ug/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