



**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 320-33890-1**

*Naval Air Warfare Center Warminster
Warminster, Pennsylvania*

August 2019

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WARMINSTER_NAWC
SSIC 5000-33c

**LABORATORY DATA PACKAGE, 320-33890-1, NAS WILLOW GROVE NAWC
WARMINSTER PA**
12/19/2017
TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

ANALYTICAL REPORT

Job Number: 320-33890-1

Job Description: Warminster: PFAS, NAS JRB Willow Grove

For:
Tetra Tech, Inc.
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Approved for release.
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Project Manager I
12/19/2017 8:33 AM

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12/19/2017

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Definitions/Glossary

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

TestAmerica Job ID: 320-33890-1

Qualifiers

LCMS

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

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	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
320-33890-1

Receipt

The samples were received on 12/5/2017 10:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.7° 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

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

Detection Summary

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

TestAmerica Job ID: 320-33890-1

Client Sample ID: NAWC-120417-RW-129

Lab Sample ID: 320-33890-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	9.2	J M	40	6.9	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	6.5	J	20	2.8	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.0	J M	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-120417-FRB-129

Lab Sample ID: 320-33890-2

No Detections.

Client Sample ID: NAWC-120417-RW-055

Lab Sample ID: 320-33890-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	3.8	J	20	2.8	ng/L	1		537	Total/NA

Client Sample ID: NAWC-120417-FRB-055

Lab Sample ID: 320-33890-4

No Detections.

Client Sample ID: NAWC-120417-RW-028

Lab Sample ID: 320-33890-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	19	J M	40	6.8	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	15	J	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)	4.5	J	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-120417-FRB-028

Lab Sample ID: 320-33890-6

No Detections.

Client Sample ID: NAWC-120417-RW-118

Lab Sample ID: 320-33890-7

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	19	J	40	6.9	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	16	J	20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	10	J	30	5.5	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.0	J	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-120417-FRB-118

Lab Sample ID: 320-33890-8

No Detections.

Client Sample ID: NAWC-120417-RW-071

Lab Sample ID: 320-33890-9

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	6.9	J	20	2.8	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.9	J M	9.9	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-120417-FRB-071

Lab Sample ID: 320-33890-10

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

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

TestAmerica Job ID: 320-33890-1

Client Sample ID: NAWC-120417-RW-075

Lab Sample ID: 320-33890-11

No Detections.

Client Sample ID: NAWC-120417-FRB-075

Lab Sample ID: 320-33890-12

No Detections.

Client Sample ID: WGNA-120417-DUP13

Lab Sample ID: 320-33890-13

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	3.8	J	20	2.8	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.1	J M	10	1.9	ng/L	1		537	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-33890-1

Client Sample ID: NAWC-120417-RW-129

Lab Sample ID: 320-33890-1

Date Collected: 12/04/17 10:10

Matrix: Water

Date Received: 12/05/17 10:30

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	9.2	J M	40	6.9	ng/L		12/07/17 13:23	12/08/17 12:58	1
Perfluorooctanoic acid (PFOA)	6.5	J	20	2.8	ng/L		12/07/17 13:23	12/08/17 12:58	1
Perfluorononanoic acid (PFNA)	20	U M	24	8.1	ng/L		12/07/17 13:23	12/08/17 12:58	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.6	ng/L		12/07/17 13:23	12/08/17 12:58	1
Perfluoroheptanoic acid (PFHpA)	2.0	J M	10	1.9	ng/L		12/07/17 13:23	12/08/17 12:58	1
Perfluorobutanesulfonic acid (PFBS)	36	U	91	16	ng/L		12/07/17 13:23	12/08/17 12:58	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	98		70 - 130	12/07/17 13:23	12/08/17 12:58	1
13C2 PFDA	97		70 - 130	12/07/17 13:23	12/08/17 12:58	1

Client Sample ID: NAWC-120417-FRB-129

Lab Sample ID: 320-33890-2

Date Collected: 12/04/17 10:05

Matrix: Water

Date Received: 12/05/17 10:30

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.9	ng/L		12/07/17 13:23	12/08/17 13:46	1
Perfluorooctanoic acid (PFOA)	8.1	U	20	2.8	ng/L		12/07/17 13:23	12/08/17 13:46	1
Perfluorononanoic acid (PFNA)	20	U	24	8.1	ng/L		12/07/17 13:23	12/08/17 13:46	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.6	ng/L		12/07/17 13:23	12/08/17 13:46	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		12/07/17 13:23	12/08/17 13:46	1
Perfluorobutanesulfonic acid (PFBS)	36	U	91	16	ng/L		12/07/17 13:23	12/08/17 13:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	95		70 - 130	12/07/17 13:23	12/08/17 13:46	1
13C2 PFDA	93		70 - 130	12/07/17 13:23	12/08/17 13:46	1

Client Sample ID: NAWC-120417-RW-055

Lab Sample ID: 320-33890-3

Date Collected: 12/04/17 10:40

Matrix: Water

Date Received: 12/05/17 10:30

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		12/07/17 13:23	12/08/17 13:51	1
Perfluorooctanoic acid (PFOA)	3.8	J	20	2.8	ng/L		12/07/17 13:23	12/08/17 13:51	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		12/07/17 13:23	12/08/17 13:51	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		12/07/17 13:23	12/08/17 13:51	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		12/07/17 13:23	12/08/17 13:51	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		12/07/17 13:23	12/08/17 13:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	100		70 - 130	12/07/17 13:23	12/08/17 13:51	1
13C2 PFDA	96		70 - 130	12/07/17 13:23	12/08/17 13:51	1

Client Sample Results

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

TestAmerica Job ID: 320-33890-1

Client Sample ID: NAWC-120417-FRB-055

Lab Sample ID: 320-33890-4

Date Collected: 12/04/17 10:35

Matrix: Water

Date Received: 12/05/17 10:30

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		12/07/17 13:23	12/08/17 13:55	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		12/07/17 13:23	12/08/17 13:55	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		12/07/17 13:23	12/08/17 13:55	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		12/07/17 13:23	12/08/17 13:55	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		12/07/17 13:23	12/08/17 13:55	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		12/07/17 13:23	12/08/17 13:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	96		70 - 130	12/07/17 13:23	12/08/17 13:55	1
13C2 PFDA	95		70 - 130	12/07/17 13:23	12/08/17 13:55	1

Client Sample ID: NAWC-120417-RW-028

Lab Sample ID: 320-33890-5

Date Collected: 12/04/17 11:10

Matrix: Water

Date Received: 12/05/17 10:30

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	19	J M	40	6.8	ng/L		12/07/17 13:23	12/08/17 14:00	1
Perfluorooctanoic acid (PFOA)	15	J	20	2.8	ng/L		12/07/17 13:23	12/08/17 14:00	1
Perfluorononanoic acid (PFNA)	20	U M	24	8.0	ng/L		12/07/17 13:23	12/08/17 14:00	1
Perfluorohexanesulfonic acid (PFHxS)	7.6	J	30	5.5	ng/L		12/07/17 13:23	12/08/17 14:00	1
Perfluoroheptanoic acid (PFHpA)	4.5	J	10	1.9	ng/L		12/07/17 13:23	12/08/17 14:00	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		12/07/17 13:23	12/08/17 14:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	91		70 - 130	12/07/17 13:23	12/08/17 14:00	1
13C2 PFDA	96		70 - 130	12/07/17 13:23	12/08/17 14:00	1

Client Sample ID: NAWC-120417-FRB-028

Lab Sample ID: 320-33890-6

Date Collected: 12/04/17 11:05

Matrix: Water

Date Received: 12/05/17 10:30

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		12/07/17 13:23	12/08/17 14:05	1
Perfluorooctanoic acid (PFOA)	8.1	U	20	2.8	ng/L		12/07/17 13:23	12/08/17 14:05	1
Perfluorononanoic acid (PFNA)	20	U	24	8.1	ng/L		12/07/17 13:23	12/08/17 14:05	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		12/07/17 13:23	12/08/17 14:05	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		12/07/17 13:23	12/08/17 14:05	1
Perfluorobutanesulfonic acid (PFBS)	36	U	91	16	ng/L		12/07/17 13:23	12/08/17 14:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	97		70 - 130	12/07/17 13:23	12/08/17 14:05	1
13C2 PFDA	95		70 - 130	12/07/17 13:23	12/08/17 14:05	1

Client Sample Results

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

TestAmerica Job ID: 320-33890-1

Client Sample ID: NAWC-120417-RW-118

Lab Sample ID: 320-33890-7

Date Collected: 12/04/17 11:40

Matrix: Water

Date Received: 12/05/17 10:30

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	19	J	40	6.9	ng/L		12/07/17 13:23	12/08/17 14:10	1
Perfluorooctanoic acid (PFOA)	16	J	20	2.8	ng/L		12/07/17 13:23	12/08/17 14:10	1
Perfluorononanoic acid (PFNA)	20	U M	24	8.1	ng/L		12/07/17 13:23	12/08/17 14:10	1
Perfluorohexanesulfonic acid (PFHxS)	10	J	30	5.5	ng/L		12/07/17 13:23	12/08/17 14:10	1
Perfluoroheptanoic acid (PFHpA)	5.0	J	10	1.9	ng/L		12/07/17 13:23	12/08/17 14:10	1
Perfluorobutanesulfonic acid (PFBS)	36	U	91	16	ng/L		12/07/17 13:23	12/08/17 14:10	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	97		70 - 130				12/07/17 13:23	12/08/17 14:10	1
13C2 PFDA	95		70 - 130				12/07/17 13:23	12/08/17 14:10	1

Client Sample ID: NAWC-120417-FRB-118

Lab Sample ID: 320-33890-8

Date Collected: 12/04/17 11:35

Matrix: Water

Date Received: 12/05/17 10:30

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	41	6.9	ng/L		12/07/17 13:23	12/08/17 14:14	1
Perfluorooctanoic acid (PFOA)	8.1	U	20	2.8	ng/L		12/07/17 13:23	12/08/17 14:14	1
Perfluorononanoic acid (PFNA)	20	U	24	8.1	ng/L		12/07/17 13:23	12/08/17 14:14	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.6	ng/L		12/07/17 13:23	12/08/17 14:14	1
Perfluoroheptanoic acid (PFHpA)	4.1	U	10	1.9	ng/L		12/07/17 13:23	12/08/17 14:14	1
Perfluorobutanesulfonic acid (PFBS)	37	U	91	16	ng/L		12/07/17 13:23	12/08/17 14:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	93		70 - 130				12/07/17 13:23	12/08/17 14:14	1
13C2 PFDA	94		70 - 130				12/07/17 13:23	12/08/17 14:14	1

Client Sample ID: NAWC-120417-RW-071

Lab Sample ID: 320-33890-9

Date Collected: 12/04/17 12:10

Matrix: Water

Date Received: 12/05/17 10:30

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		12/07/17 13:23	12/08/17 14:19	1
Perfluorooctanoic acid (PFOA)	6.9	J	20	2.8	ng/L		12/07/17 13:23	12/08/17 14:19	1
Perfluorononanoic acid (PFNA)	20	U	24	7.9	ng/L		12/07/17 13:23	12/08/17 14:19	1
Perfluorohexanesulfonic acid (PFHxS)	12	U M	30	5.5	ng/L		12/07/17 13:23	12/08/17 14:19	1
Perfluoroheptanoic acid (PFHpA)	2.9	J M	9.9	1.9	ng/L		12/07/17 13:23	12/08/17 14:19	1
Perfluorobutanesulfonic acid (PFBS)	36	U	89	16	ng/L		12/07/17 13:23	12/08/17 14:19	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	95		70 - 130				12/07/17 13:23	12/08/17 14:19	1
13C2 PFDA	96		70 - 130				12/07/17 13:23	12/08/17 14:19	1

Client Sample Results

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

TestAmerica Job ID: 320-33890-1

Client Sample ID: NAWC-120417-FRB-071

Lab Sample ID: 320-33890-10

Date Collected: 12/04/17 12:05

Matrix: Water

Date Received: 12/05/17 10:30

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	41	6.9	ng/L		12/07/17 13:23	12/08/17 14:24	1
Perfluorooctanoic acid (PFOA)	8.1	U	20	2.9	ng/L		12/07/17 13:23	12/08/17 14:24	1
Perfluorononanoic acid (PFNA)	20	U	24	8.1	ng/L		12/07/17 13:23	12/08/17 14:24	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	31	5.6	ng/L		12/07/17 13:23	12/08/17 14:24	1
Perfluoroheptanoic acid (PFHpA)	4.1	U	10	1.9	ng/L		12/07/17 13:23	12/08/17 14:24	1
Perfluorobutanesulfonic acid (PFBS)	37	U	92	16	ng/L		12/07/17 13:23	12/08/17 14:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	95		70 - 130	12/07/17 13:23	12/08/17 14:24	1
13C2 PFDA	92		70 - 130	12/07/17 13:23	12/08/17 14:24	1

Client Sample ID: NAWC-120417-RW-075

Lab Sample ID: 320-33890-11

Date Collected: 12/04/17 12:40

Matrix: Water

Date Received: 12/05/17 10:30

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.9	ng/L		12/07/17 13:23	12/08/17 14:28	1
Perfluorooctanoic acid (PFOA)	8.1	U	20	2.8	ng/L		12/07/17 13:23	12/08/17 14:28	1
Perfluorononanoic acid (PFNA)	20	U	24	8.1	ng/L		12/07/17 13:23	12/08/17 14:28	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.6	ng/L		12/07/17 13:23	12/08/17 14:28	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		12/07/17 13:23	12/08/17 14:28	1
Perfluorobutanesulfonic acid (PFBS)	36	U	91	16	ng/L		12/07/17 13:23	12/08/17 14:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	98		70 - 130	12/07/17 13:23	12/08/17 14:28	1
13C2 PFDA	92		70 - 130	12/07/17 13:23	12/08/17 14:28	1

Client Sample ID: NAWC-120417-FRB-075

Lab Sample ID: 320-33890-12

Date Collected: 12/04/17 12:35

Matrix: Water

Date Received: 12/05/17 10:30

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		12/07/17 13:23	12/08/17 14:42	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		12/07/17 13:23	12/08/17 14:42	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		12/07/17 13:23	12/08/17 14:42	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		12/07/17 13:23	12/08/17 14:42	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		12/07/17 13:23	12/08/17 14:42	1
Perfluorobutanesulfonic acid (PFBS)	36	U	91	16	ng/L		12/07/17 13:23	12/08/17 14:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	102		70 - 130	12/07/17 13:23	12/08/17 14:42	1
13C2 PFDA	91		70 - 130	12/07/17 13:23	12/08/17 14:42	1

Client Sample Results

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

TestAmerica Job ID: 320-33890-1

Client Sample ID: WGNA-120417-DUP13

Lab Sample ID: 320-33890-13

Date Collected: 12/04/17 07:00

Matrix: Water

Date Received: 12/05/17 10:30

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U M	40	6.8	ng/L		12/07/17 13:23	12/08/17 14:47	1
Perfluorooctanoic acid (PFOA)	3.8	J	20	2.8	ng/L		12/07/17 13:23	12/08/17 14:47	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		12/07/17 13:23	12/08/17 14:47	1
Perfluorohexanesulfonic acid (PFHxS)	12	U M	30	5.5	ng/L		12/07/17 13:23	12/08/17 14:47	1
Perfluoroheptanoic acid (PFHpA)	2.1	J M	10	1.9	ng/L		12/07/17 13:23	12/08/17 14:47	1
Perfluorobutanesulfonic acid (PFBS)	36	U M	90	16	ng/L		12/07/17 13:23	12/08/17 14:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>13C2 PFHxA</i>	96		70 - 130	12/07/17 13:23	12/08/17 14:47	1
<i>13C2 PFDA</i>	86		70 - 130	12/07/17 13:23	12/08/17 14:47	1

Default Detection Limits

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

TestAmerica Job ID: 320-33890-1

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: 320-33890-1

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

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		PFHxA (70-130)	PFDA (70-130)
320-33890-1	NAWC-120417-RW-129	98	97
320-33890-1 LMS	NAWC-120417-RW-129	101	92
320-33890-1 LMSD	NAWC-120417-RW-129	95	95
320-33890-2	NAWC-120417-FRB-129	95	93
320-33890-3	NAWC-120417-RW-055	100	96
320-33890-4	NAWC-120417-FRB-055	96	95
320-33890-5	NAWC-120417-RW-028	91	96
320-33890-6	NAWC-120417-FRB-028	97	95
320-33890-7	NAWC-120417-RW-118	97	95
320-33890-8	NAWC-120417-FRB-118	93	94
320-33890-9	NAWC-120417-RW-071	95	96
320-33890-10	NAWC-120417-FRB-071	95	92
320-33890-11	NAWC-120417-RW-075	98	92
320-33890-12	NAWC-120417-FRB-075	102	91
320-33890-13	WGNA-120417-DUP13	96	86
LLCS 320-198839/2-A	Lab Control Sample	100	95
MB 320-198839/1-A	Method Blank	103	95

Surrogate Legend

PFHxA = 13C2 PFHxA

PFDA = 13C2 PFDA

QC Sample Results

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

TestAmerica Job ID: 320-33890-1

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

Lab Sample ID: MB 320-198839/1-A
Matrix: Water
Analysis Batch: 199060

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 198839

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		12/07/17 13:23	12/08/17 12:49	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		12/07/17 13:23	12/08/17 12:49	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		12/07/17 13:23	12/08/17 12:49	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		12/07/17 13:23	12/08/17 12:49	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		12/07/17 13:23	12/08/17 12:49	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		12/07/17 13:23	12/08/17 12:49	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFHxA	103		70 - 130	12/07/17 13:23	12/08/17 12:49	1
13C2 PFDA	95		70 - 130	12/07/17 13:23	12/08/17 12:49	1

Lab Sample ID: LLCS 320-198839/2-A
Matrix: Water
Analysis Batch: 199060

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 198839

Analyte	Spike Added	LLCS	LLCS	Unit	D	%Rec	%Rec.	Limits
		Result	Qualifier					
Perfluorooctanesulfonic acid (PFOS)	40.0	39.9	J M	ng/L		100		50 - 150
Perfluorooctanoic acid (PFOA)	20.0	20.0		ng/L		100		50 - 150
Perfluorononanoic acid (PFNA)	20.0	20.2	J	ng/L		101		50 - 150
Perfluorohexanesulfonic acid (PFHxS)	30.0	34.2		ng/L		114		50 - 150
Perfluoroheptanoic acid (PFHpA)	10.0	10.9		ng/L		109		50 - 150
Perfluorobutanesulfonic acid (PFBS)	90.0	109		ng/L		121		50 - 150

Surrogate	LLCS	LLCS	Limits
	%Recovery	Qualifier	
13C2 PFHxA	100		70 - 130
13C2 PFDA	95		70 - 130

Lab Sample ID: 320-33890-1 LMS
Matrix: Water
Analysis Batch: 199060

Client Sample ID: NAWC-120417-RW-129
Prep Type: Total/NA
Prep Batch: 198839

Analyte	Sample	Sample	Spike Added	LMS	LMS	Unit	D	%Rec	%Rec.	Limits
	Result	Qualifier		Result	Qualifier					
Perfluorooctanesulfonic acid (PFOS)	9.2	J M	40.0	47.4	M	ng/L		95		50 - 150
Perfluorooctanoic acid (PFOA)	6.5	J	20.0	25.5		ng/L		95		50 - 150
Perfluorononanoic acid (PFNA)	20	U M	20.0	20.2	J	ng/L		101		50 - 150
Perfluorohexanesulfonic acid (PFHxS)	12	U	30.0	37.5		ng/L		125		50 - 150
Perfluoroheptanoic acid (PFHpA)	2.0	J M	10.0	12.3		ng/L		103		50 - 150
Perfluorobutanesulfonic acid (PFBS)	36	U	90.0	113		ng/L		125		50 - 150

Surrogate	LMS	LMS	Limits
	%Recovery	Qualifier	
13C2 PFHxA	101		70 - 130
13C2 PFDA	92		70 - 130

QC Sample Results

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

TestAmerica Job ID: 320-33890-1

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

Lab Sample ID: 320-33890-1 LMSD

Matrix: Water

Analysis Batch: 199060

Client Sample ID: NAWC-120417-RW-129

Prep Type: Total/NA

Prep Batch: 198839

Analyte	Sample	Sample	Spike	LMSD	LMSD	Unit	D	%Rec	%Rec.	RPD	RPD
	Result	Qualifier	Added	Result	Qualifier				Limits	Limit	
Perfluorooctanesulfonic acid (PFOS)	9.2	J M	40.3	50.1	M	ng/L		101	50 - 150	6	50
Perfluorooctanoic acid (PFOA)	6.5	J	20.2	26.0		ng/L		97	50 - 150	2	50
Perfluorononanoic acid (PFNA)	20	U M	20.1	21.4	J	ng/L		106	50 - 150	6	50
Perfluorohexanesulfonic acid (PFHxS)	12	U	30.2	38.7		ng/L		128	50 - 150	3	50
Perfluoroheptanoic acid (PFHpA)	2.0	J M	10.1	13.5		ng/L		114	50 - 150	10	50
Perfluorobutanesulfonic acid (PFBS)	36	U	90.7	102		ng/L		113	50 - 150	10	50
		LMSD	LMSD								
Surrogate	%Recovery	Qualifier	Limits								
13C2 PFHxA	95		70 - 130								
13C2 PFDA	95		70 - 130								

QC Association Summary

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

TestAmerica Job ID: 320-33890-1

LCMS

Prep Batch: 198839

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-33890-1	NAWC-120417-RW-129	Total/NA	Water	537	
320-33890-2	NAWC-120417-FRB-129	Total/NA	Water	537	
320-33890-3	NAWC-120417-RW-055	Total/NA	Water	537	
320-33890-4	NAWC-120417-FRB-055	Total/NA	Water	537	
320-33890-5	NAWC-120417-RW-028	Total/NA	Water	537	
320-33890-6	NAWC-120417-FRB-028	Total/NA	Water	537	
320-33890-7	NAWC-120417-RW-118	Total/NA	Water	537	
320-33890-8	NAWC-120417-FRB-118	Total/NA	Water	537	
320-33890-9	NAWC-120417-RW-071	Total/NA	Water	537	
320-33890-10	NAWC-120417-FRB-071	Total/NA	Water	537	
320-33890-11	NAWC-120417-RW-075	Total/NA	Water	537	
320-33890-12	NAWC-120417-FRB-075	Total/NA	Water	537	
320-33890-13	WGNA-120417-DUP13	Total/NA	Water	537	
MB 320-198839/1-A	Method Blank	Total/NA	Water	537	
LLCS 320-198839/2-A	Lab Control Sample	Total/NA	Water	537	
320-33890-1 LMS	NAWC-120417-RW-129	Total/NA	Water	537	
320-33890-1 LMSD	NAWC-120417-RW-129	Total/NA	Water	537	

Analysis Batch: 199060

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-33890-1	NAWC-120417-RW-129	Total/NA	Water	537	198839
MB 320-198839/1-A	Method Blank	Total/NA	Water	537	198839
LLCS 320-198839/2-A	Lab Control Sample	Total/NA	Water	537	198839
320-33890-1 LMS	NAWC-120417-RW-129	Total/NA	Water	537	198839
320-33890-1 LMSD	NAWC-120417-RW-129	Total/NA	Water	537	198839

Analysis Batch: 199064

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-33890-2	NAWC-120417-FRB-129	Total/NA	Water	537	198839
320-33890-3	NAWC-120417-RW-055	Total/NA	Water	537	198839
320-33890-4	NAWC-120417-FRB-055	Total/NA	Water	537	198839
320-33890-5	NAWC-120417-RW-028	Total/NA	Water	537	198839
320-33890-6	NAWC-120417-FRB-028	Total/NA	Water	537	198839
320-33890-7	NAWC-120417-RW-118	Total/NA	Water	537	198839
320-33890-8	NAWC-120417-FRB-118	Total/NA	Water	537	198839
320-33890-9	NAWC-120417-RW-071	Total/NA	Water	537	198839
320-33890-10	NAWC-120417-FRB-071	Total/NA	Water	537	198839
320-33890-11	NAWC-120417-RW-075	Total/NA	Water	537	198839

Analysis Batch: 199066

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-33890-12	NAWC-120417-FRB-075	Total/NA	Water	537	198839
320-33890-13	WGNA-120417-DUP13	Total/NA	Water	537	198839

Lab Chronicle

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

TestAmerica Job ID: 320-33890-1

Client Sample ID: NAWC-120417-RW-129

Date Collected: 12/04/17 10:10

Date Received: 12/05/17 10:30

Lab Sample ID: 320-33890-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			198839	12/07/17 13:23	KMK	TAL SAC
Total/NA	Analysis	537		1	199060	12/08/17 12:58	TTP	TAL SAC

Client Sample ID: NAWC-120417-FRB-129

Date Collected: 12/04/17 10:05

Date Received: 12/05/17 10:30

Lab Sample ID: 320-33890-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			198839	12/07/17 13:23	KMK	TAL SAC
Total/NA	Analysis	537		1	199064	12/08/17 13:46	JRB	TAL SAC

Client Sample ID: NAWC-120417-RW-055

Date Collected: 12/04/17 10:40

Date Received: 12/05/17 10:30

Lab Sample ID: 320-33890-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			198839	12/07/17 13:23	KMK	TAL SAC
Total/NA	Analysis	537		1	199064	12/08/17 13:51	JRB	TAL SAC

Client Sample ID: NAWC-120417-FRB-055

Date Collected: 12/04/17 10:35

Date Received: 12/05/17 10:30

Lab Sample ID: 320-33890-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			198839	12/07/17 13:23	KMK	TAL SAC
Total/NA	Analysis	537		1	199064	12/08/17 13:55	JRB	TAL SAC

Client Sample ID: NAWC-120417-RW-028

Date Collected: 12/04/17 11:10

Date Received: 12/05/17 10:30

Lab Sample ID: 320-33890-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			198839	12/07/17 13:23	KMK	TAL SAC
Total/NA	Analysis	537		1	199064	12/08/17 14:00	JRB	TAL SAC

Client Sample ID: NAWC-120417-FRB-028

Date Collected: 12/04/17 11:05

Date Received: 12/05/17 10:30

Lab Sample ID: 320-33890-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			198839	12/07/17 13:23	KMK	TAL SAC
Total/NA	Analysis	537		1	199064	12/08/17 14:05	JRB	TAL SAC

TestAmerica Sacramento

Lab Chronicle

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

TestAmerica Job ID: 320-33890-1

Client Sample ID: NAWC-120417-RW-118

Date Collected: 12/04/17 11:40

Date Received: 12/05/17 10:30

Lab Sample ID: 320-33890-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			198839	12/07/17 13:23	KMK	TAL SAC
Total/NA	Analysis	537		1	199064	12/08/17 14:10	JRB	TAL SAC

Client Sample ID: NAWC-120417-FRB-118

Date Collected: 12/04/17 11:35

Date Received: 12/05/17 10:30

Lab Sample ID: 320-33890-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			198839	12/07/17 13:23	KMK	TAL SAC
Total/NA	Analysis	537		1	199064	12/08/17 14:14	JRB	TAL SAC

Client Sample ID: NAWC-120417-RW-071

Date Collected: 12/04/17 12:10

Date Received: 12/05/17 10:30

Lab Sample ID: 320-33890-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			198839	12/07/17 13:23	KMK	TAL SAC
Total/NA	Analysis	537		1	199064	12/08/17 14:19	JRB	TAL SAC

Client Sample ID: NAWC-120417-FRB-071

Date Collected: 12/04/17 12:05

Date Received: 12/05/17 10:30

Lab Sample ID: 320-33890-10

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			198839	12/07/17 13:23	KMK	TAL SAC
Total/NA	Analysis	537		1	199064	12/08/17 14:24	JRB	TAL SAC

Client Sample ID: NAWC-120417-RW-075

Date Collected: 12/04/17 12:40

Date Received: 12/05/17 10:30

Lab Sample ID: 320-33890-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			198839	12/07/17 13:23	KMK	TAL SAC
Total/NA	Analysis	537		1	199064	12/08/17 14:28	JRB	TAL SAC

Client Sample ID: NAWC-120417-FRB-075

Date Collected: 12/04/17 12:35

Date Received: 12/05/17 10:30

Lab Sample ID: 320-33890-12

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			198839	12/07/17 13:23	KMK	TAL SAC
Total/NA	Analysis	537		1	199066	12/08/17 14:42	JRB	TAL SAC

TestAmerica Sacramento

Lab Chronicle

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

TestAmerica Job ID: 320-33890-1

Client Sample ID: WGNA-120417-DUP13

Lab Sample ID: 320-33890-13

Date Collected: 12/04/17 07:00

Matrix: Water

Date Received: 12/05/17 10:30

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Prepared or Analyzed</u>	<u>Analyst</u>	<u>Lab</u>
Total/NA	Prep	537			198839	12/07/17 13:23	KMK	TAL SAC
Total/NA	Analysis	537		1	199066	12/08/17 14:47	JRB	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

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

TestAmerica Job ID: 320-33890-1

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	12-18-17 *
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-18
California	State Program	9	2897	01-31-18
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	01-29-18
Illinois	NELAP	5	200060	03-17-18
Kansas	NELAP	7	E-10375	12-31-17
L-A-B	DoD ELAP		L2468	01-20-18
Louisiana	NELAP	6	30612	06-30-18
Maine	State Program	1	CA0004	04-18-18
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	01-28-18
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	12-30-17
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	12-31-17
Wyoming	State Program	8	8TMS-L	01-28-19

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

Method Summary

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

TestAmerica Job ID: 320-33890-1

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-33890-1

Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-33890-1	NAWC-120417-RW-129	Water	12/04/17 10:10	12/05/17 10:30
320-33890-2	NAWC-120417-FRB-129	Water	12/04/17 10:05	12/05/17 10:30
320-33890-3	NAWC-120417-RW-055	Water	12/04/17 10:40	12/05/17 10:30
320-33890-4	NAWC-120417-FRB-055	Water	12/04/17 10:35	12/05/17 10:30
320-33890-5	NAWC-120417-RW-028	Water	12/04/17 11:10	12/05/17 10:30
320-33890-6	NAWC-120417-FRB-028	Water	12/04/17 11:05	12/05/17 10:30
320-33890-7	NAWC-120417-RW-118	Water	12/04/17 11:40	12/05/17 10:30
320-33890-8	NAWC-120417-FRB-118	Water	12/04/17 11:35	12/05/17 10:30
320-33890-9	NAWC-120417-RW-071	Water	12/04/17 12:10	12/05/17 10:30
320-33890-10	NAWC-120417-FRB-071	Water	12/04/17 12:05	12/05/17 10:30
320-33890-11	NAWC-120417-RW-075	Water	12/04/17 12:40	12/05/17 10:30
320-33890-12	NAWC-120417-FRB-075	Water	12/04/17 12:35	12/05/17 10:30
320-33890-13	WGNA-120417-DUP13	Water	12/04/17 07:00	12/05/17 10:30

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1

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.: 320-33890-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 199060

Lab Sample ID: CCVL 320-199060/1 Client Sample ID: _____

Date Analyzed: 12/08/17 12:35 Lab File ID: 2017.12.08_537AA_001.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.08	Isomers	phomsophat	12/08/17 13:51

Lab Sample ID: CCV 320-199060/2 CCVIS Client Sample ID: _____

Date Analyzed: 12/08/17 12:39 Lab File ID: 2017.12.08_537AA_002.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.08	Isomers	phomsophat	12/08/17 13:52

Lab Sample ID: LLCS 320-198839/2-A Client Sample ID: _____

Date Analyzed: 12/08/17 12:53 Lab File ID: 2017.12.08_537AA_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.08	Isomers	phomsophat	12/08/17 13:53

Lab Sample ID: 320-33890-1 Client Sample ID: NAWC-120417-RW-129

Date Analyzed: 12/08/17 12:58 Lab File ID: 2017.12.08_537AA_006.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	1.62	Assign Peak	phomsophat	12/08/17 13:55
Perfluorooctanesulfonic acid (PFOS)	2.07	Isomers	phomsophat	12/08/17 13:54
Perfluorononanoic acid (PFNA)	2.08	Assign Peak	phomsophat	12/08/17 13:56

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 199060

Lab Sample ID: 320-33890-1 LMS Client Sample ID: NAWC-120417-RW-129 LMS

Date Analyzed: 12/08/17 13:03 Lab File ID: 2017.12.08_537AA_007.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.08	Isomers	phomsopha t	12/08/17 13:56

Lab Sample ID: 320-33890-1 LMSD Client Sample ID: NAWC-120417-RW-129 LMSD

Date Analyzed: 12/08/17 13:07 Lab File ID: 2017.12.08_537AA_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.07	Isomers	phomsopha t	12/08/17 13:57

Lab Sample ID: CCV 320-199060/11 CCVIS Client Sample ID: _____

Date Analyzed: 12/08/17 13:21 Lab File ID: 2017.12.08_537AA_011.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.06	Isomers	phomsopha t	12/08/17 13:58

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 199064

Lab Sample ID: CCV 320-199064/4 CCVIS Client Sample ID: _____

Date Analyzed: 12/08/17 13:37 Lab File ID: 2017.12.08_537AA_014.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.06	Missed Peak	barnettj	12/11/17 09:53

Lab Sample ID: 320-33890-5 Client Sample ID: NAWC-120417-RW-028

Date Analyzed: 12/08/17 14:00 Lab File ID: 2017.12.08_537AA_019.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.06	Missed Peak	barnettj	12/11/17 09:56
Perfluorononanoic acid (PFNA)	2.07	Missed Peak	barnettj	12/11/17 09:56

Lab Sample ID: 320-33890-7 Client Sample ID: NAWC-120417-RW-118

Date Analyzed: 12/08/17 14:10 Lab File ID: 2017.12.08_537AA_021.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	2.07	Missed Peak	barnettj	12/11/17 09:58

Lab Sample ID: 320-33890-9 Client Sample ID: NAWC-120417-RW-071

Date Analyzed: 12/08/17 14:19 Lab File ID: 2017.12.08_537AA_023.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	1.62	Missed Peak	barnettj	12/11/17 09:59
Perfluorohexanesulfonic acid (PFHxS)	1.62	Missed Peak	barnettj	12/11/17 09:59

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 199064

Lab Sample ID: CCV 320-199064/16 CCVIS Client Sample ID: _____

Date Analyzed: 12/08/17 14:33 Lab File ID: 2017.12.08_537AA_026.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.06	Split Peak	barnettj	12/11/17 09:54

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 199066

Lab Sample ID: CCV 320-199066/16 CCVIS Client Sample ID: _____

Date Analyzed: 12/08/17 14:33 Lab File ID: 2017.12.08_537AA_026.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.06	Split Peak	barnettj	12/11/17 09:54

Lab Sample ID: 320-33890-13 Client Sample ID: WGNA-120417-DUP13

Date Analyzed: 12/08/17 14:47 Lab File ID: 2017.12.08_537AA_029.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.36	Missed Peak	barnettj	12/11/17 10:01
Perfluoroheptanoic acid (PFHpA)	1.62	Missed Peak	barnettj	12/11/17 10:01
Perfluorohexanesulfonic acid (PFHxS)	1.62	Missed Peak	barnettj	12/11/17 10:01
Perfluorooctanesulfonic acid (PFOS)	2.06	Missed Peak	barnettj	12/11/17 10:00

Lab Sample ID: CCV 320-199066/20 CCVIS Client Sample ID: _____

Date Analyzed: 12/08/17 14:52 Lab File ID: 2017.12.08_537AA_030.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.06	Missed Peak	barnettj	12/11/17 09:55

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-33890-1

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
.LC537-IS_00045	01/05/18	07/05/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	28.68 ng/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	0.1 ug/mL
..LCMPFOS_00019	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	0.2868 ug/mL
LC537-ICV_00028	01/05/18	08/02/17	MeOH/H2O, Lot 067374	10 mL	LC537-SU_00046	1000 uL	13C2 PFDA	50 ug/mL
.LC537-SU_00046	01/05/18	07/05/17	Methanol, Lot 104453	30000 uL	LC537ICIM_00019	20 uL	13C2 PFHxA	47.8 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	10 ng/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	100.119 ng/mL
.LC537ICIM_00019	01/25/18	08/01/17	Methanol, Lot 090285	25 mL	LC537-PFBS2_00008	0.6 mL	Perfluorobutanesulfonic acid (PFBS)	9.99613 ng/mL
..LC537-PFBS2_00008	01/25/18	07/25/17	Methanol, Lot 090285	20 mL	LC537-PFHxA2_00011	0.061 mL	Perfluoroheptanoic acid (PFHpA)	20.0761 ng/mL
...LC537-PFHxA2_00011	09/08/22	Santa Cruz Biotechnology, Lot F0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	20.1272 ng/mL
..LC537-PFHxA2_00011	01/25/18	07/25/17	Methanol, Lot 09092	31 mL	LC537-PFHxS2_00008	0.122 mL	Perfluorohexanesulfonic acid (PFHxS)	20.4843 ng/mL
...LC537-PFHxS2_00008	06/13/22	Afla Aesar, Lot 10200390			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	19.698 ng/mL
..LC537-PFHxS2_00008	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537-PFNA2_00009	0.126 mL	Perfluorononanoic acid (PFNA)	20.2421 ug/mL
...LC537-PFNA2_00009	06/08/22	Santa Cruz Biotechnology, Lot G2516			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	9.849 ug/mL
..LC537-PFNA2_00009	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537-PFOA2_00010	0.122 mL	Perfluorooctanoic acid (PFOA)	10.0636 ug/mL
...LC537-PFOA2_00010	06/14/22	Aldrich, Lot MKCC0699			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	10.2421 ug/mL
..LC537-PFOA2_00010	01/25/18	08/01/17	Methanol, Lot 090285	20 mL	LC537-PFOS2_00010	0.124 mL	Perfluorooctanesulfonic acid (PFOS)	9.849 ug/mL
...LC537-PFOS2_00010	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	2085.82 ug/mL
..LC537-PFOS2_00010	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537-PFNA2_00002	0.0418 g	Perfluorobutanesulfonic acid (PFBS)	0.998 g/g
...LC537-PFNA2_00002	09/08/22	Santa Cruz Biotechnology, Lot F0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	2048.39 ug/mL
..LC537-PFNA2_00002	01/25/18	07/25/17	Methanol, Lot 09092	31 mL	LC537-PFHxA2_00002	0.0635 g	Perfluoroheptanoic acid (PFHpA)	1 g/g
...LC537-PFHxA2_00002	06/13/22	Afla Aesar, Lot 10200390			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	2056.98 ug/mL
..LC537-PFHxA2_00011	01/25/18	07/25/17	Methanol, Lot 09092	31 mL	LC537-PFHxS2_00002	0.0475 g	Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFHxS2_00002	06/08/22	Santa Cruz Biotechnology, Lot G2516			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	1996.74 ug/mL
..LC537-PFHxS2_00002	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537-PFOA2_00002	0.0421 g	Perfluorononanoic acid (PFNA)	0.996 g/g
...LC537-PFOA2_00002	06/14/22	Aldrich, Lot MKCC0699			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	2098.8 ug/mL
..LC537-PFOA2_00010	01/25/18	08/01/17	Methanol, Lot 090285	20 mL	LC537-PFOA2_00002	0.0424 g	Perfluorooctanoic acid (PFOA)	0.99 g/g
...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.: 320-33890-1

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_00053	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.: 320-33890-1

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
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFDA	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
LC537-SU_00049	500 uL	13C4 PFOS	28.68 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.: 320-33890-1

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 BCM2579V			(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
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	47.8 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFDA	50 ug/mL
					(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.: 320-33890-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	13C2 PFHxA	10 ng/mL		
							Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL		
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL		
							Perfluorononanoic acid (PFNA)	277.827 ng/mL		
Perfluorooctanoic acid (PFOA)	278.01 ng/mL									
Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL									
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	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.: 320-33890-1

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		
LC537-SU_00049	500 uL	13C2 PFDA	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.: 320-33890-1

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.: 320-33890-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
....LC537_PFB_S_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
..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
..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	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
							13C2 PFDA	10 ng/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LC537-SU_00049	500 uL	13C2 PFHxA	10 ng/mL
							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.: 320-33890-1

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.: 320-33890-1

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 BCM2579V			(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_00056	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_PFB_00002

#: 4/1/15 SPV

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: www.sigmaaldrich.com

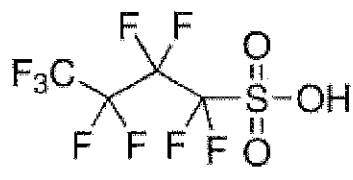
Email USA: techserv@sial.com

Outside USA: eurtechserv@sial.com

Certificate of Analysis

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

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



PFBS

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

Jamie Gleason

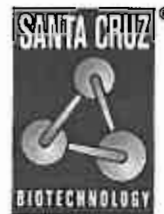
Jamie Gleason, Manager
Quality Control
Milwaukee, Wisconsin US

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Reagent

LC537_PFB2_00002

F: 6.8.17 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)	$\geq 97\%$	101.3%
Infrared Spectrum	Conforms to structure	Complies

Reagent

LC537_PFHpA_00002

R: 4/1/15 4V

Certificate of Analysis

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

PFHpA

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

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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Reagent

LC537_PFHpA2_00002

Certificate of analysis

r:6.13.17 SW

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

PFHe A

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 stw

Certificate of Analysis

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

Product Number: 50929

Batch Number: BCBL3545V

Brand: Aldrich

CAS Number: 3871-99-6

Formula: C₆F₁₃KO₃S

Formula Weight: 438.20

Quality Release Date: 20 JUN 2013

PFH₁₃S-K

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

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

$$MW_{corr} = \frac{(k_{form}) - (k) + (H)}{438.20 (k_{form})} = \frac{(438.20 - 3910 + 101)}{438.20 (k_{form})} = 0.91307 \text{ (anion form)}$$

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

stw 4/1/15

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

Reagent

LC537_PFHxS2_00002

n: 6-8-17 SKJ

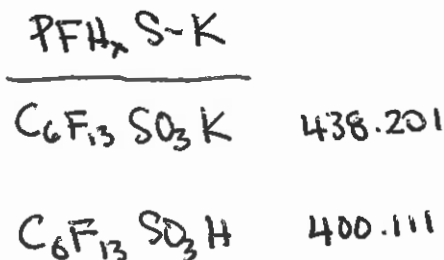


The Future of Science

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%



MW correction = $\frac{400.11}{438.201} = 0.91307$ PFH₁₃S
 CAS# 355-46-4

Purity $\frac{1}{9}$ MW correction = 90.9%

This document was produced electronically and is valid without a signature.

Reagent

LC537_PENA_00002

R: 4/1/15 SKV



Certificate of Analysis

Apr 2, 2015 (JST)

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

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

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

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

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

PFNA

Reagent

LC537_PFN2_00002

P: 6.14.17 SKW

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: www.sigmaaldrich.com

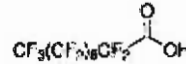
Email USA: techserv@sial.com

Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name:
Perfluorononanoic acid - 97%

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



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

Michael Grady, Manager
Quality Control
Milwaukee, WI US

PFNA

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

Reagent

LC537_PFOA_00003

R: 11/30/16 SKV
PFA

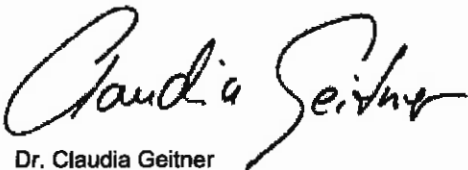
SIGMA-ALDRICH

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

Certificate of Analysis

Product Name: PENTADECAFLUOROOCCTANOIC ACID
analytical standard
Product Number: 33824
Batch Number: BCBS1198V
Brand: Sigma-Aldrich
CAS Number: 335-67-1
Formula: $\text{CF}_3(\text{CF}_2)_6\text{COOH}$
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



Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

Reagent

LC537_PFOA2_00002

Certificate of analysis

P: 6/21/17 SW ✓

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

PFOA

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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Reagent

LC537_PFOs_00003

n: 11/30/16 SV
PFOS

SIGMA-ALDRICH

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

Assay (LC-MS)

Date of Analysis

complying

98 %

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

Sigma-Aldrich Laborchemikalien GmbH
Quality Management SA-LC

Reagent

LC537_PFO2_00002

R: 6.14.17 SKV

Certificate of Analysis

Product Name: HEPTADEC AFLUORO OCTANESULFONIC 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

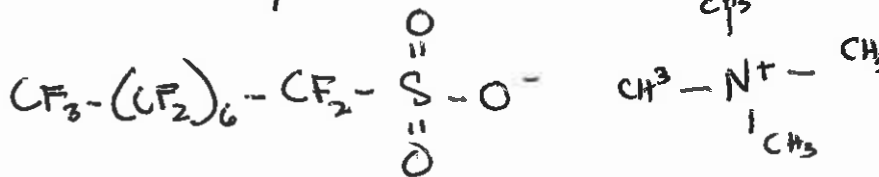
Quality Release Date: 11 JUN 2015

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

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

Purity & MW correction = 77.37%



	$C_8 F_{17} SO_3^+ H$	$C_8 H_{20} N$
C = 12.011	96.088	96.088
F = 18.998	322.966	—
S = 32.066	32.066	—
O = 16.999	47.997	20.60
H = 1.008	1.008	14.007
N = 14.007	—	—
	<hr/>	<hr/>
	500.125	130.255

Reagent

LCM2PFOA_00007

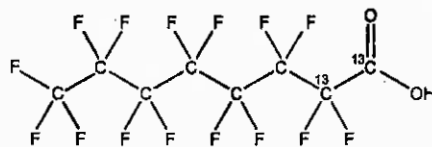


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFOA **LOT NUMBER:** M2PFOA0216
COMPOUND: Perfluoro-n-[1,2-¹³C₂]octanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₆HF₁₆O₂ **MOLECULAR WEIGHT:** 416.05
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
 (1,2-¹³C₂)
LAST TESTED: (mm/dd/yyyy) 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, \dots, x_n on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

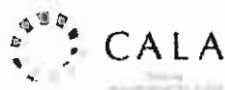
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

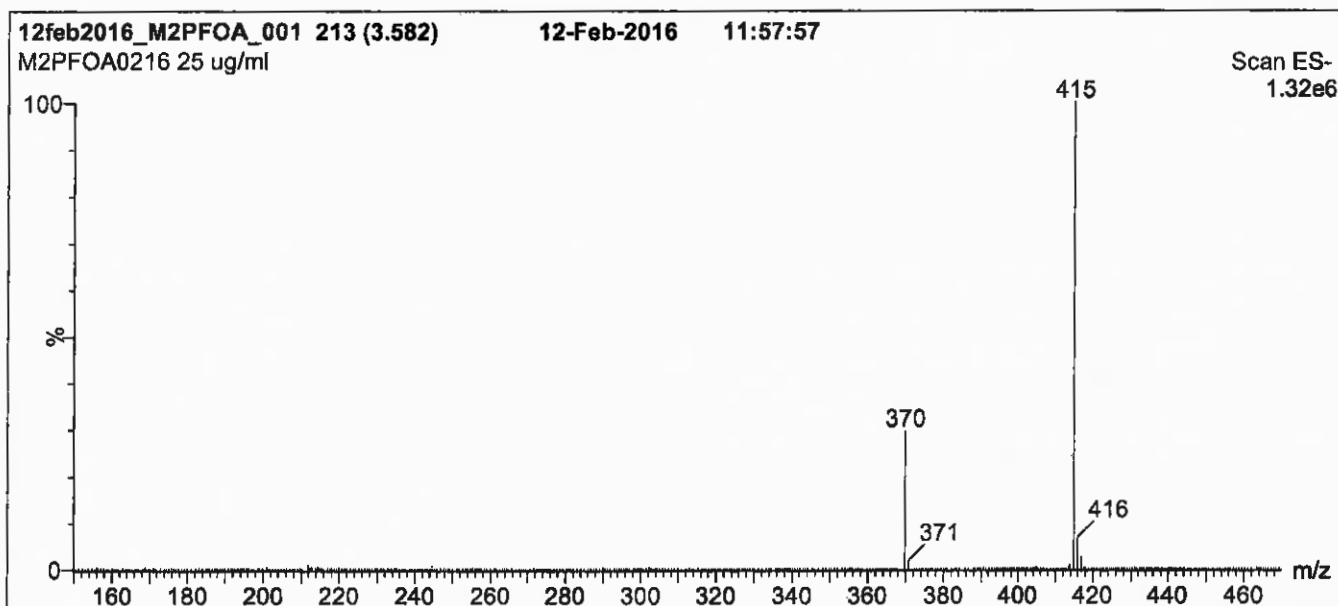
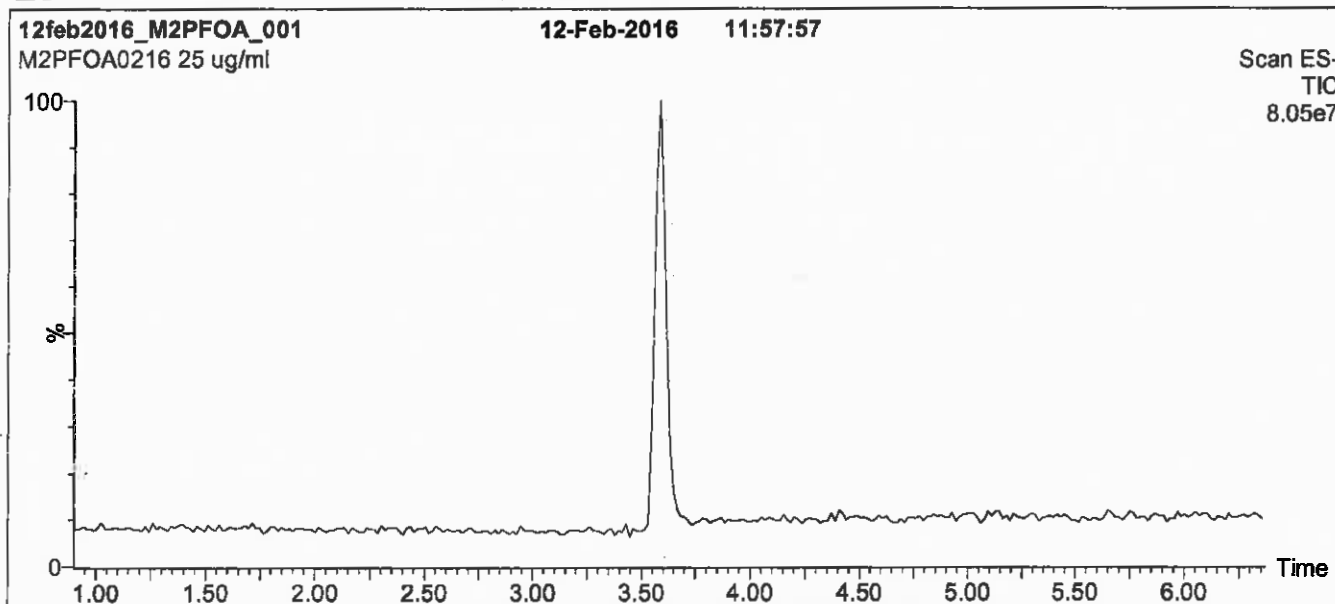
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

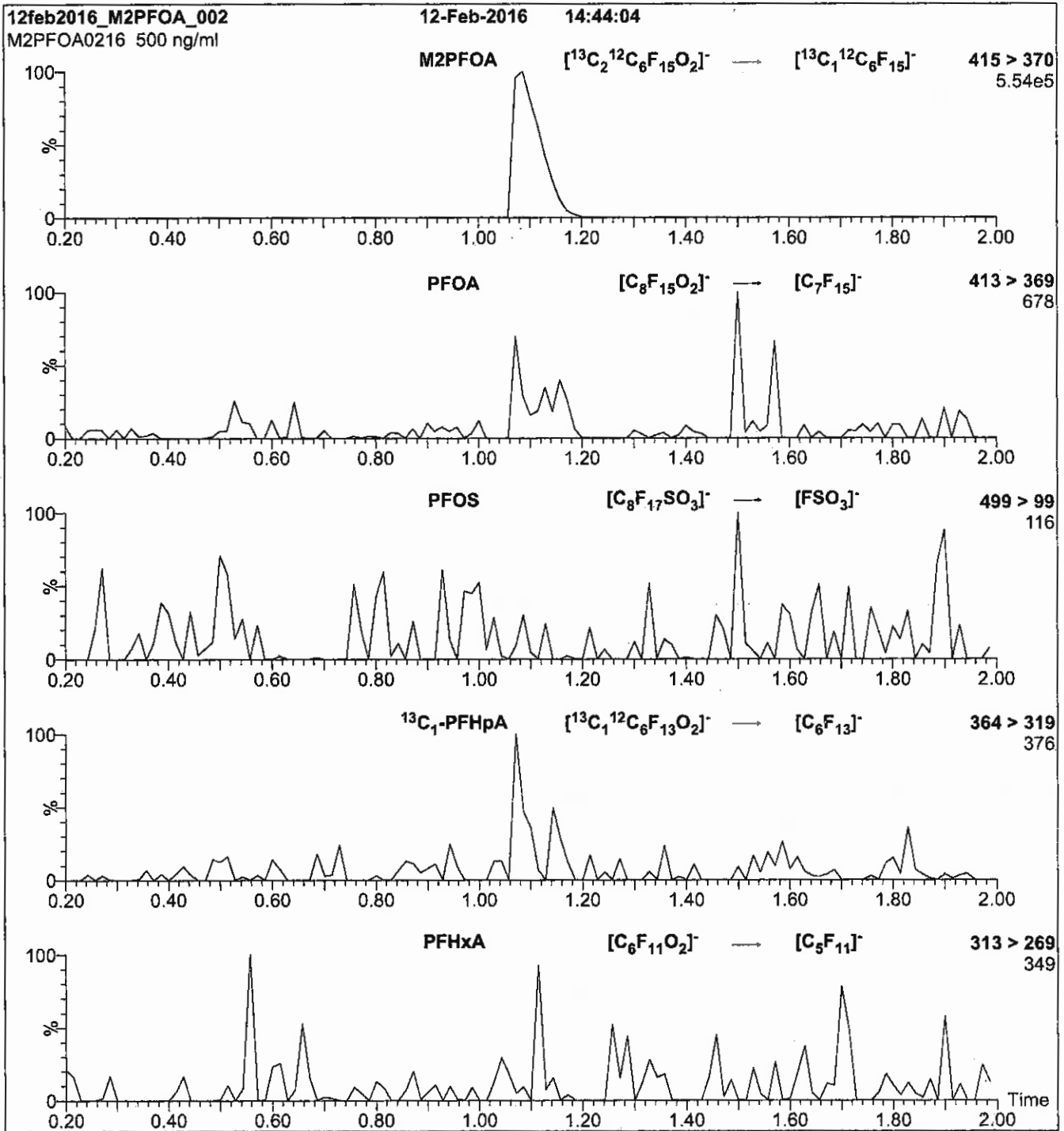
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

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

MS Parameters

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

Reagent

LCMPFDA_00012

R: SBC 12/21/16



814255

ID: LCMPPFDA_00012

Exp: 09/30/21 Prpd: SBC

13C2-Perfluorodecanoic acid

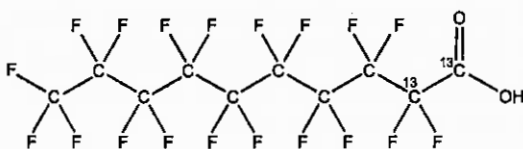


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDA **LOT NUMBER:** MPFDA0916
COMPOUND: Perfluoro-n-[1,2-¹³C₂]decanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₈HF₁₉O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 516.07
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

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 ¹³C₁-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:
B.G. Chríttim

Date: 10/07/2016
(mm/dd/yyyy)

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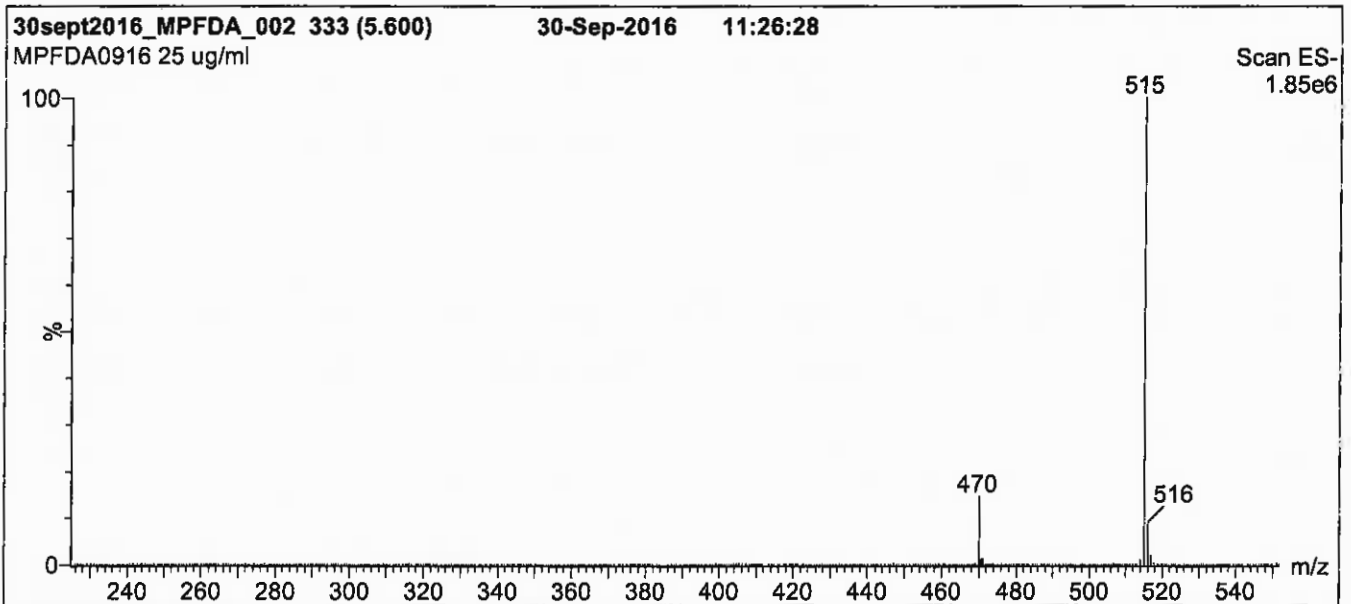
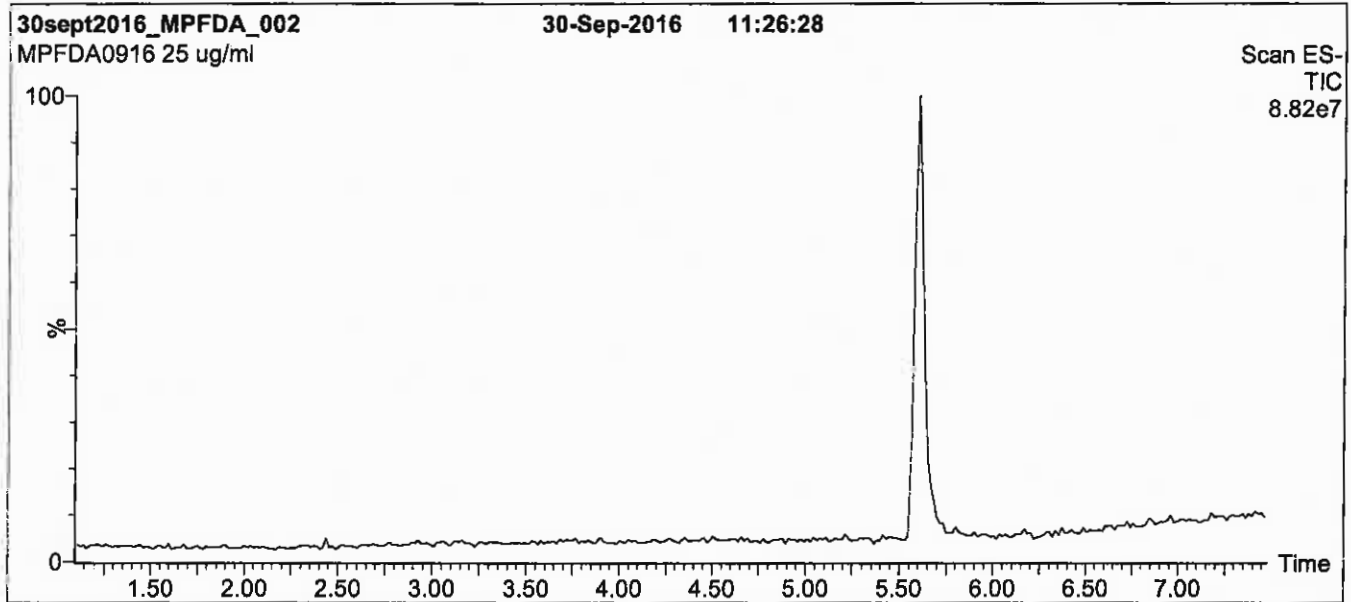
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Figure 1: MPFDA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

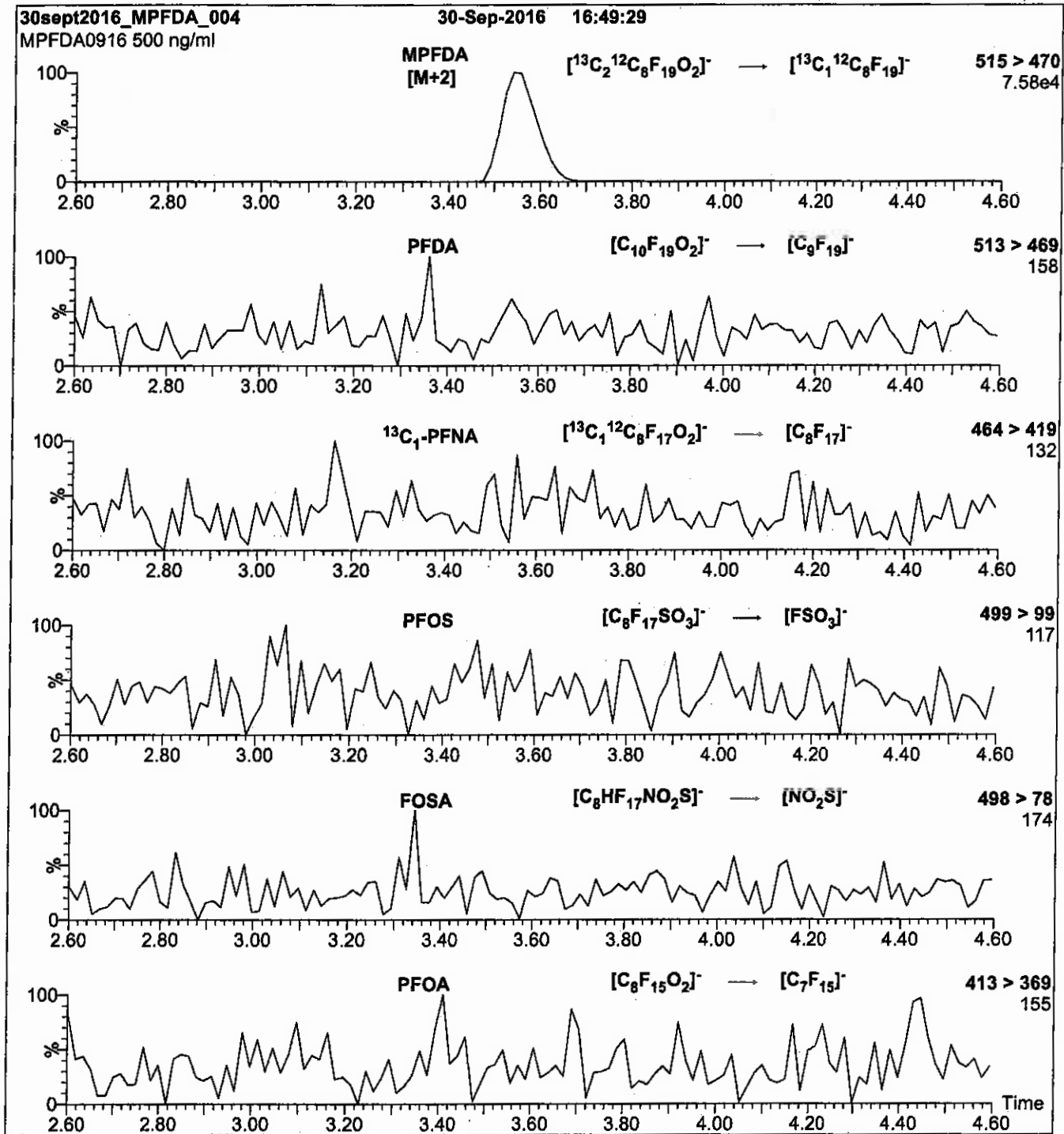
Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)
Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-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



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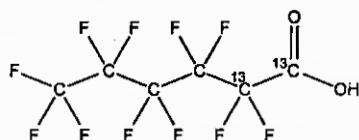
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFHxA0416

STRUCTURE:

CAS #: Not available



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

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

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99%¹³C
(1,2-¹³C₂)

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)

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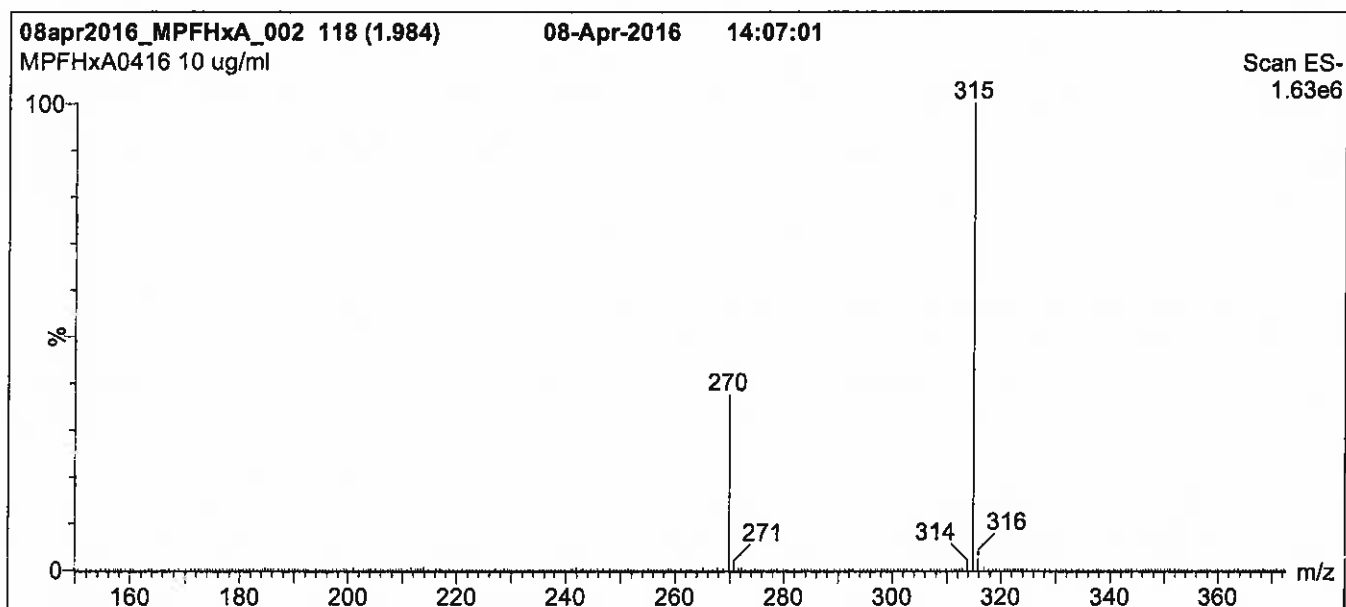
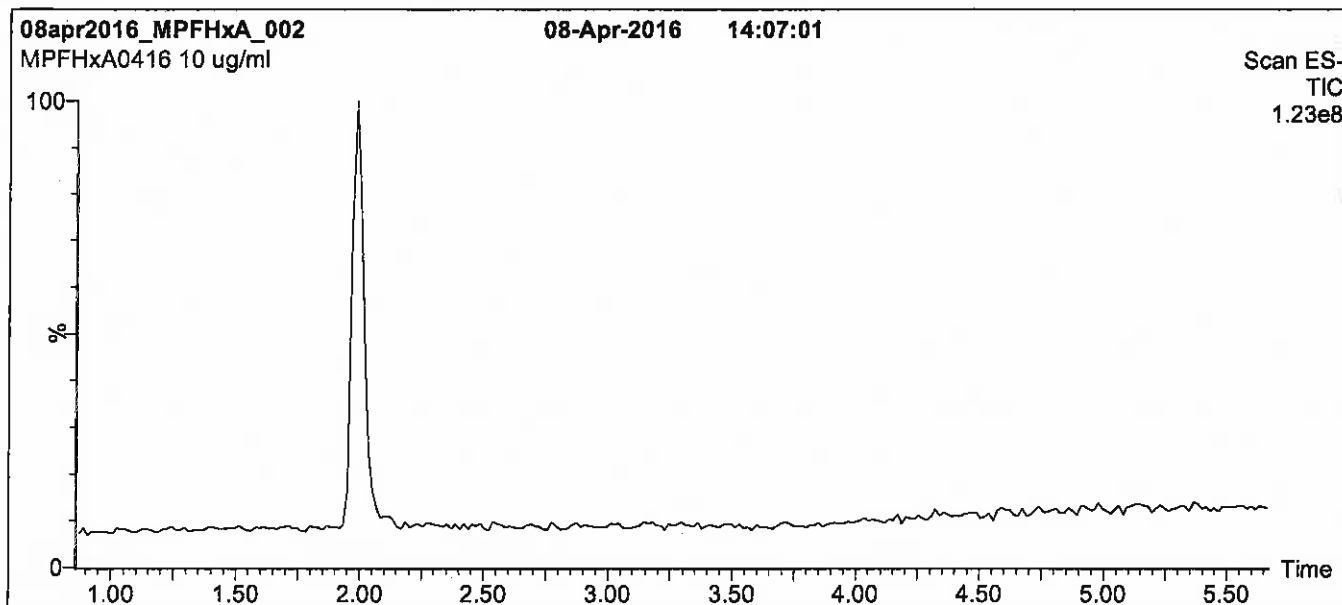
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Figure 1: MPFHxA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7.5 min and hold for 1.5 min
 before returning to initial conditions over 0.5 min.
 Time: 10 min

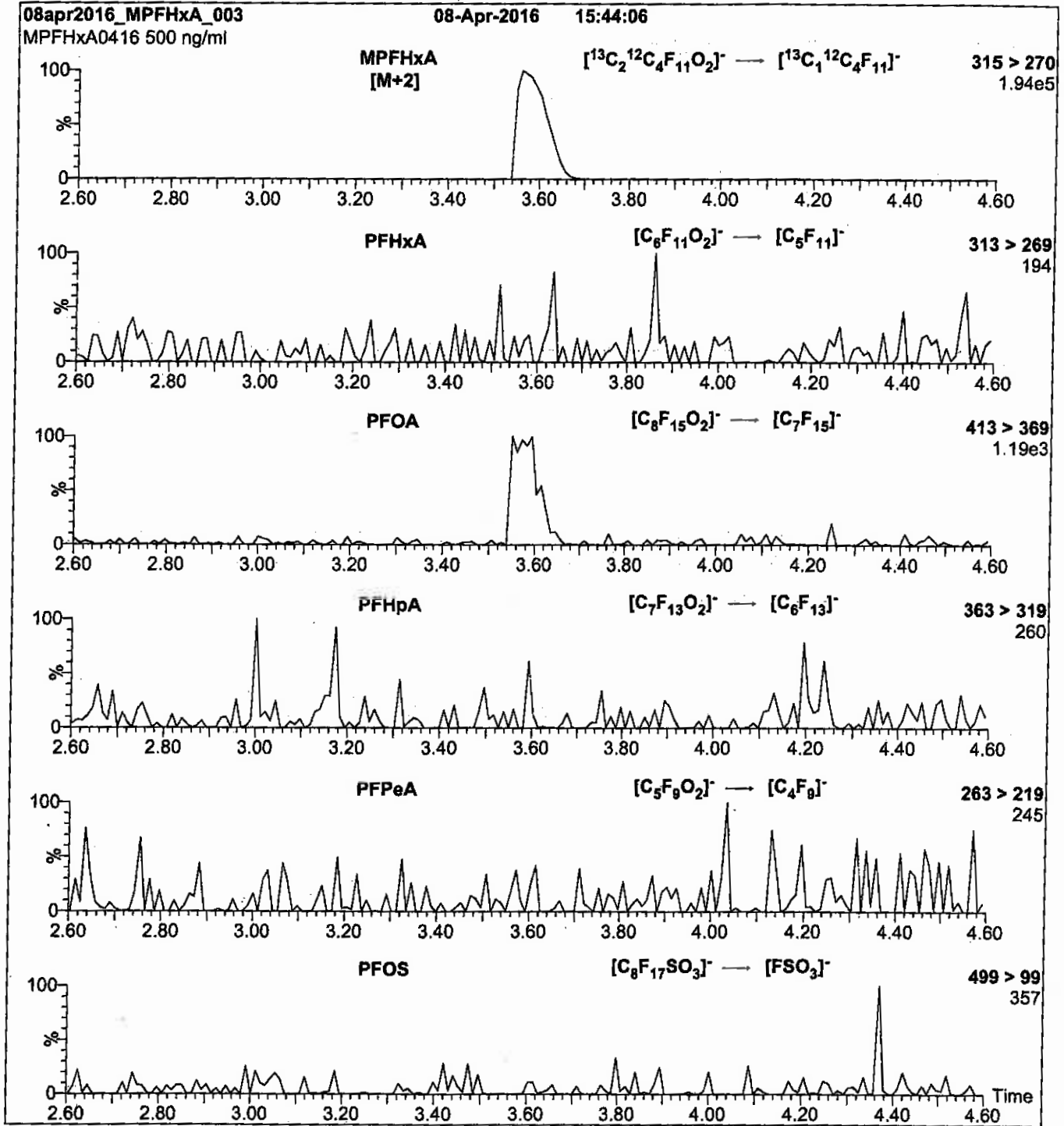
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFHxA_00015

r: 5/10/17 skd



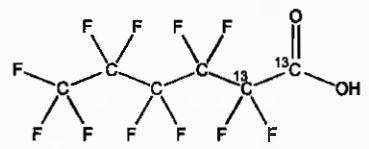
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFHxA1116

STRUCTURE: **CAS #:** Not available



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

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

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

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:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
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- Contains < 0.1% of perfluoro-n-hexanoic acid and ~ 0.3% of perfluoro-n-octanoic acid.

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Certified By: 
B.G. Chittim

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

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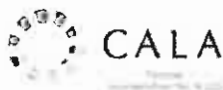
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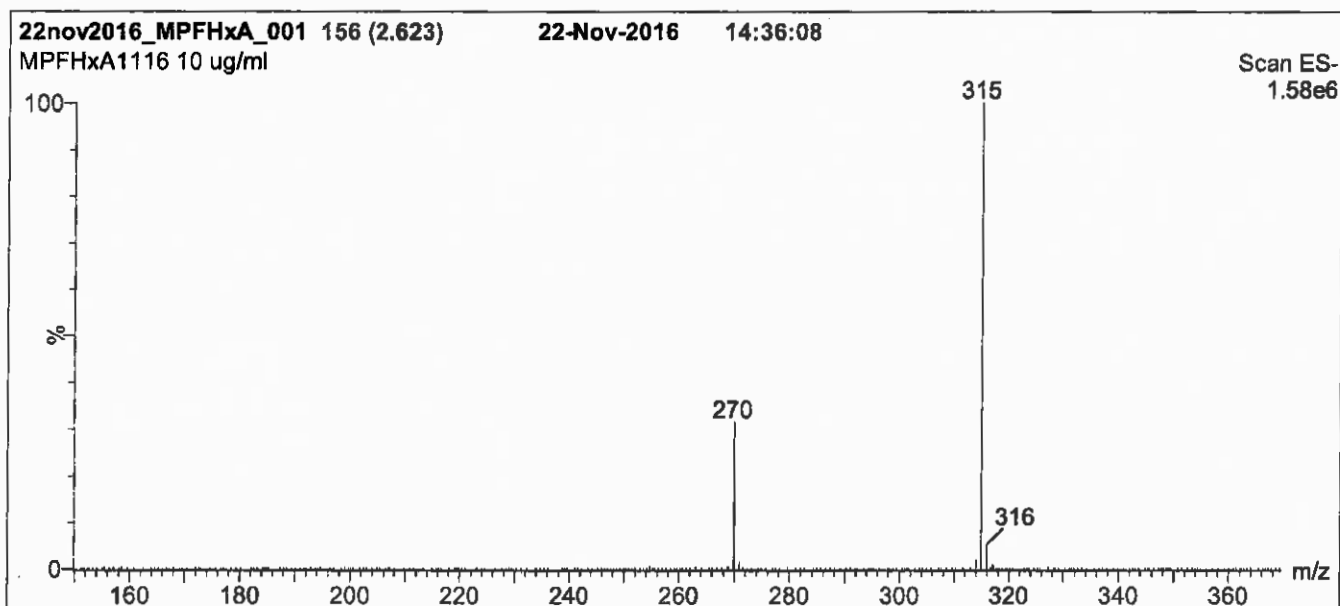
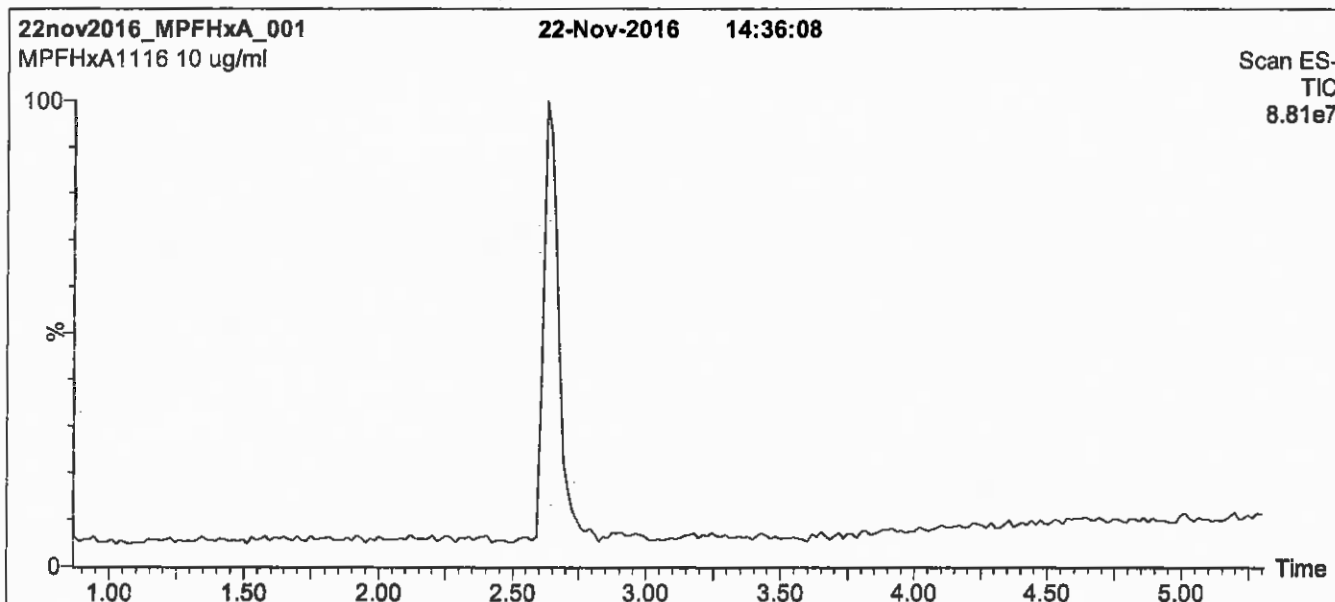
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Conditions for Figure 1:

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

Chromatographic Conditions

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

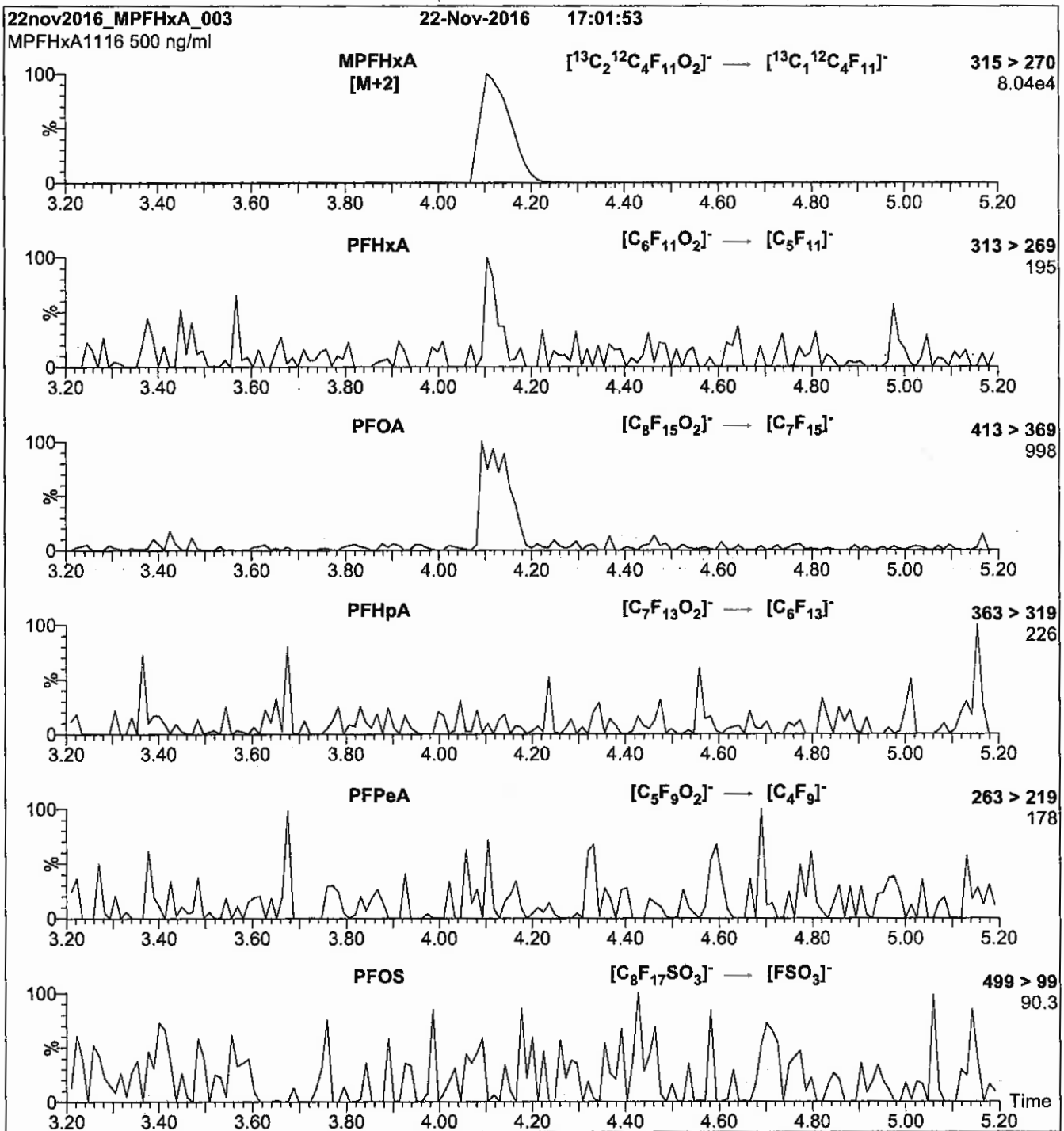
Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions over 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 μ l (500 ng/ml MPFHxA)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFOS_00019

R: SBC 12/21/16



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

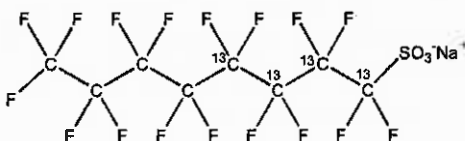


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0816
COMPOUND: Sodium perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate

STRUCTURE: **CAS #:** Not available



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


DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.8% Sodium perfluoro-1-[1,2,3-¹³C₃]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

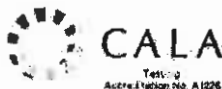
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

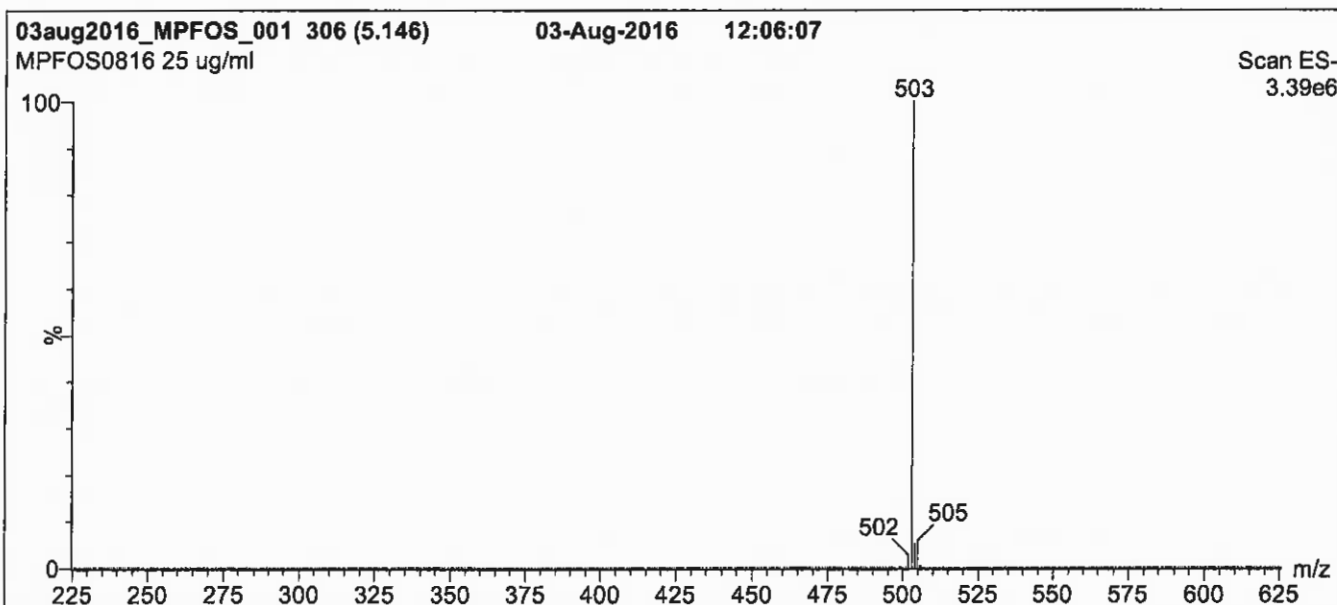
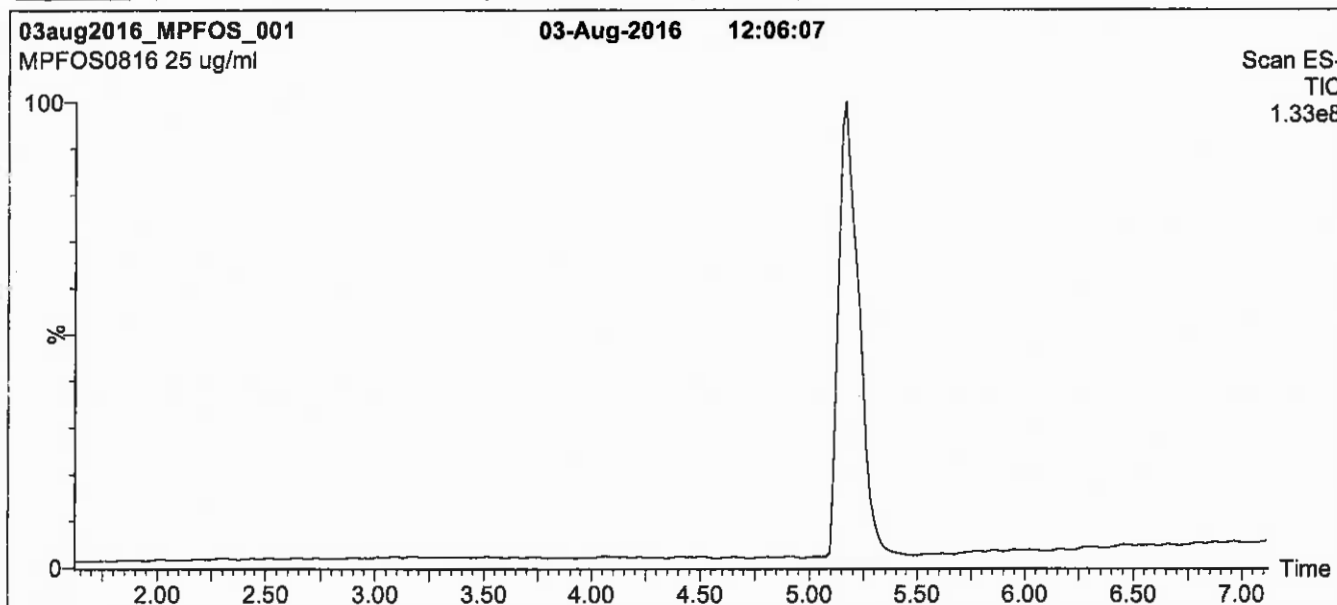
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

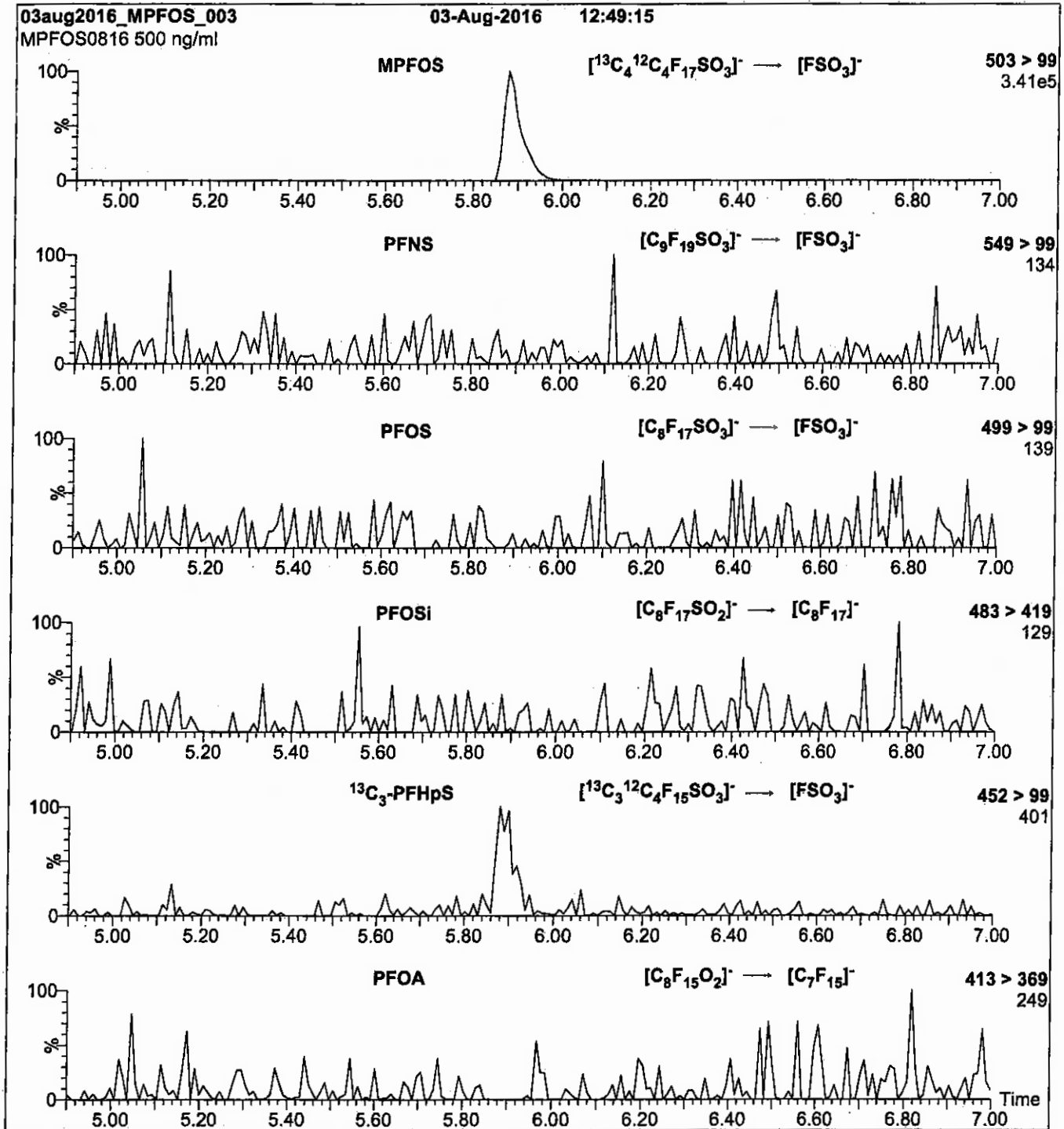
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCMPFOS_00021

r: 5/6/17 SKV

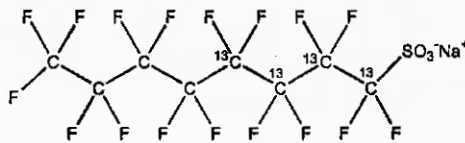


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS1216
COMPOUND: Sodium perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₄ ¹² C ₄ F ₁₇ SO ₃ Na	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)	12/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	12/12/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		


DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.8% Sodium perfluoro-1-[1,2,3-¹³C₃]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim **Date:** 12/14/2016
(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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where x is expressed as a relative standard uncertainty of the individual parameter.

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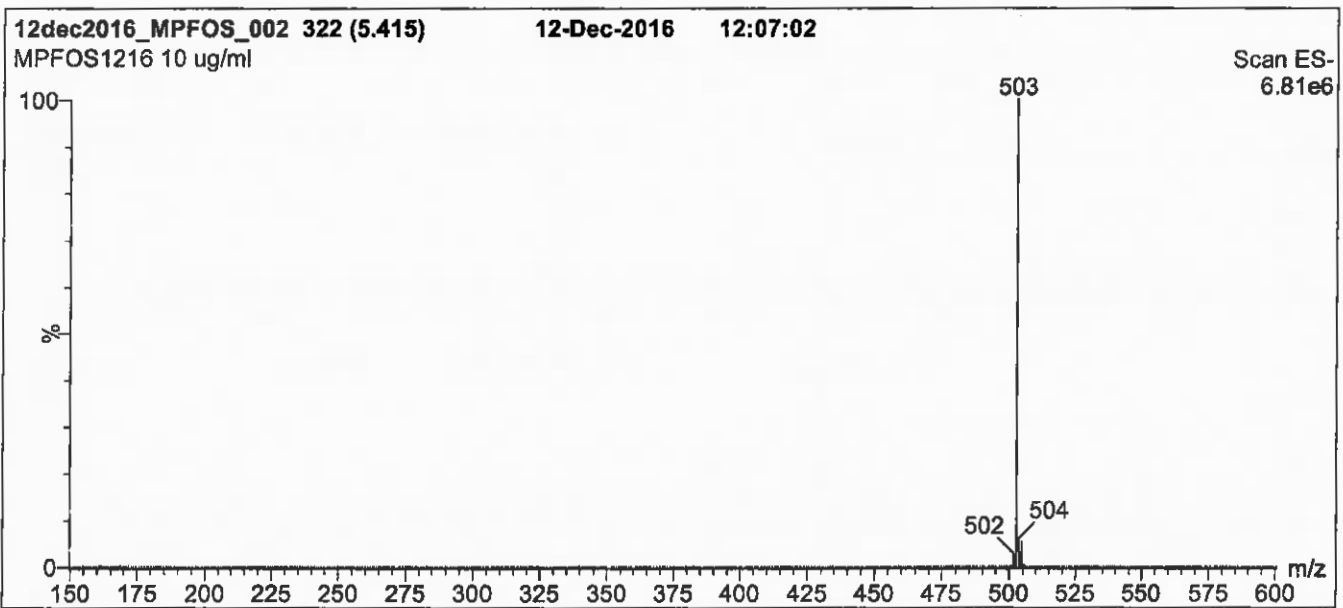
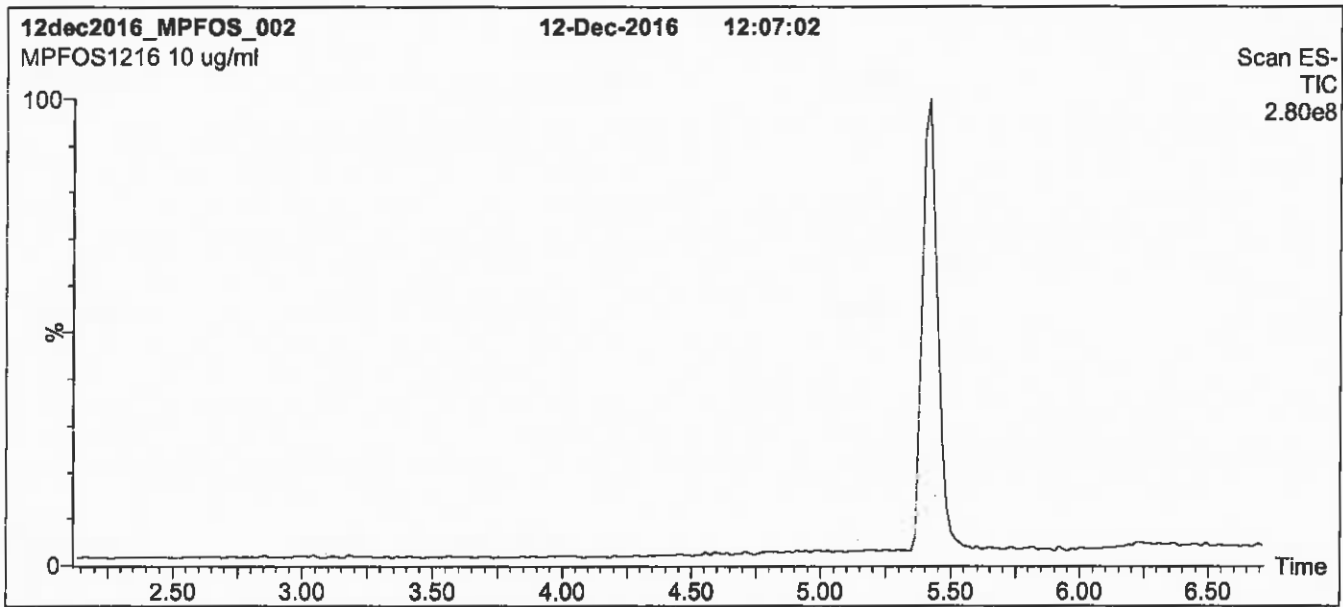
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MS: Micromass Quattro *micro* API MS

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 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 85% organic over 7.5 min and hold for 1.5 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

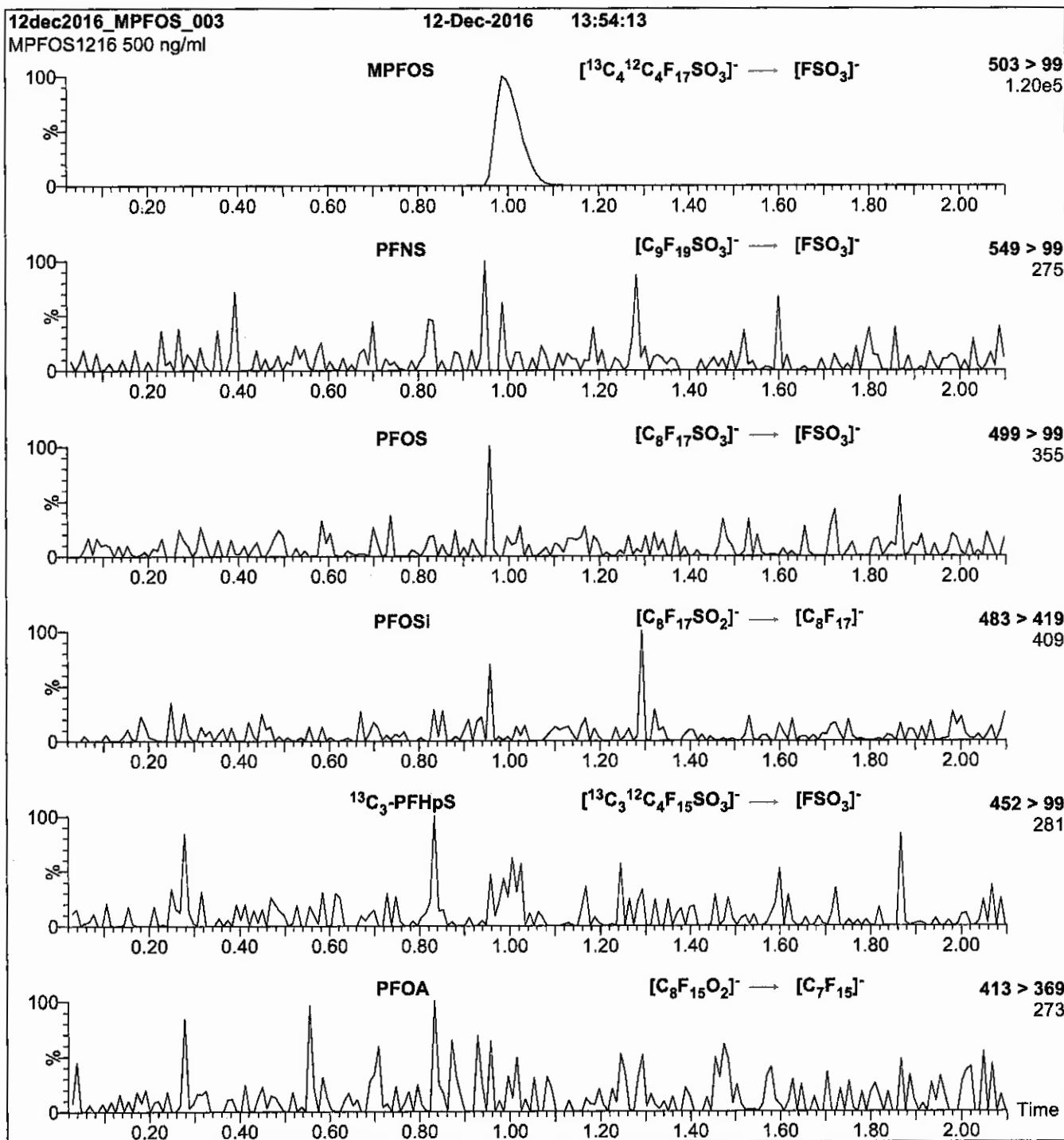
Flow: 300 μ l/min

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

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.: 320-33890-1

SDG No.: _____

Matrix: Water

Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-120417-RW-129	320-33890-1	98	97
NAWC-120417-FRB-129	320-33890-2	95	93
NAWC-120417-RW-055	320-33890-3	100	96
NAWC-120417-FRB-055	320-33890-4	96	95
NAWC-120417-RW-028	320-33890-5	91	96
NAWC-120417-FRB-028	320-33890-6	97	95
NAWC-120417-RW-118	320-33890-7	97	95
NAWC-120417-FRB-118	320-33890-8	93	94
NAWC-120417-RW-071	320-33890-9	95	96
NAWC-120417-FRB-071	320-33890-10	95	92
NAWC-120417-RW-075	320-33890-11	98	92
NAWC-120417-FRB-075	320-33890-12	102	91
WGNA-120417-DUP13	320-33890-13	96	86
	MB 320-198839/1-A	103	95
	LLCS 320-198839/2-A	100	95
NAWC-120417-RW-129 LMS	320-33890-1 LMS	101	92
NAWC-120417-RW-129 LMSD	320-33890-1 LMSD	95	95

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA

QC LIMITS
70-130
70-130

Column to be used to flag recovery values

FORM III
LCMS LOW LEVEL CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1

SDG No.: _____

Matrix: Water Level: Low Lab File ID: 2017.12.08_537AA_005.d

Lab ID: LLCS 320-198839/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LLCS CONCENTRATION (ng/L)	LLCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	40.0	39.9 J	100	50-150	M
Perfluorooctanoic acid (PFOA)	20.0	20.0	100	50-150	
Perfluorononanoic acid (PFNA)	20.0	20.2 J	101	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.0	34.2	114	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	10.9	109	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.0	109	121	50-150	

Column to be used to flag recovery and RPD values

FORM III
LCMS LOW LEVEL MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.12.08_537AA_007.d
 Lab ID: 320-33890-1 LMS Client ID: NAWC-120417-RW-129 LMS

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	LMS CONCENTRATION (ng/L)	LMS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	40.0	9.2 J	47.4	95	50-150	M
Perfluorooctanoic acid (PFOA)	20.0	6.5 J	25.5	95	50-150	
Perfluorononanoic acid (PFNA)	20.0	20 U	20.2 J	101	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.0	12 U	37.5	125	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	2.0 J	12.3	103	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.0	36 U	113	125	50-150	

Column to be used to flag recovery and RPD values

FORM III
LCMS LOW LEVEL MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.12.08_537AA_008.d
 Lab ID: 320-33890-1 LMSD Client ID: NAWC-120417-RW-129 LMSD

COMPOUND	SPIKE ADDED (ng/L)	LMSD CONCENTRATION (ng/L)	LMSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	40.3	50.1	101	6	50	50-150	M
Perfluorooctanoic acid (PFOA)	20.2	26.0	97	2	50	50-150	
Perfluorononanoic acid (PFNA)	20.1	21.4 J	106	6	50	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.2	38.7	128	3	50	50-150	
Perfluoroheptanoic acid (PFHpA)	10.1	13.5	114	10	50	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.7	102	113	10	50	50-150	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Lab File ID: 2017.12.08_537AA_004.d Lab Sample ID: MB 320-198839/1-A
 Matrix: Water Date Extracted: 12/07/2017 13:23
 Instrument ID: A8_N Date Analyzed: 12/08/2017 12:49
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LLCS 320-198839/2-A	2017.12.08_537AA 005.d	12/08/2017 12:53
NAWC-120417-RW-129	320-33890-1	2017.12.08_537AA 006.d	12/08/2017 12:58
NAWC-120417-RW-129 LMS	320-33890-1 LMS	2017.12.08_537AA 007.d	12/08/2017 13:03
NAWC-120417-RW-129 LMSD	320-33890-1 LMSD	2017.12.08_537AA 008.d	12/08/2017 13:07
NAWC-120417-FRB-129	320-33890-2	2017.12.08_537AA 016.d	12/08/2017 13:46
NAWC-120417-RW-055	320-33890-3	2017.12.08_537AA 017.d	12/08/2017 13:51
NAWC-120417-FRB-055	320-33890-4	2017.12.08_537AA 018.d	12/08/2017 13:55
NAWC-120417-RW-028	320-33890-5	2017.12.08_537AA 019.d	12/08/2017 14:00
NAWC-120417-FRB-028	320-33890-6	2017.12.08_537AA 020.d	12/08/2017 14:05
NAWC-120417-RW-118	320-33890-7	2017.12.08_537AA 021.d	12/08/2017 14:10
NAWC-120417-FRB-118	320-33890-8	2017.12.08_537AA 022.d	12/08/2017 14:14
NAWC-120417-RW-071	320-33890-9	2017.12.08_537AA 023.d	12/08/2017 14:19
NAWC-120417-FRB-071	320-33890-10	2017.12.08_537AA 024.d	12/08/2017 14:24
NAWC-120417-RW-075	320-33890-11	2017.12.08_537AA 025.d	12/08/2017 14:28
NAWC-120417-FRB-075	320-33890-12	2017.12.08_537AA 028.d	12/08/2017 14:42
WGNA-120417-DUP13	320-33890-13	2017.12.08_537AA 029.d	12/08/2017 14:47

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 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 320-199060/1		1406946	1.82	3043781	2.08		
CCV 320-199060/2 CCVIS		1459860	1.82	3121231	2.07		
MB 320-198839/1-A		1369139	1.81	2995818	2.07		
LLCS 320-198839/2-A		1404710	1.81	2981543	2.08		
320-33890-1	NAWC-120417-RW-129	1432616	1.81	3056921	2.07		
320-33890-1 LMS	NAWC-120417-RW-129 LMS	1437857	1.81	3052685	2.07		
320-33890-1 LMSD	NAWC-120417-RW-129 LMSD	1432930	1.81	3065161	2.07		
CCV 320-199060/11 CCVIS		1464431	1.81	3067130	2.06		
CCV 320-199064/4 CCVIS		1377238	1.81	2882251	2.06		
320-33890-2	NAWC-120417-FRB-129	1384062	1.81	2935444	2.07		
320-33890-3	NAWC-120417-RW-055	1419365	1.81	2983138	2.06		
320-33890-4	NAWC-120417-FRB-055	1359265	1.81	2938862	2.07		
320-33890-5	NAWC-120417-RW-028	1445759	1.81	3090514	2.06		
320-33890-6	NAWC-120417-FRB-028	1405251	1.81	2995330	2.07		
320-33890-7	NAWC-120417-RW-118	1393232	1.81	3037244	2.06		
320-33890-8	NAWC-120417-FRB-118	1399280	1.81	2932875	2.06		
320-33890-9	NAWC-120417-RW-071	1272649	1.81	2667570	2.06		
320-33890-10	NAWC-120417-FRB-071	1389736	1.81	2950821	2.06		
320-33890-11	NAWC-120417-RW-075	1421524	1.81	2926970	2.06		
CCV 320-199064/16 CCVIS		1389631	1.81	3085685	2.06		
CCV 320-199066/16 CCVIS		1389631	1.81	3085685	2.06		
320-33890-12	NAWC-120417-FRB-075	1255016	1.81	2594570	2.06		
320-33890-13	WGNA-120417-DUP13	1427376	1.80	2970166	2.06		
CCV 320-199066/20 CCVIS		1386851	1.81	2971857	2.06		

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Sample No.: CCV 320-199060/2 Date Analyzed: 12/08/2017 12:39
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.08_537AA_00 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1459860	1.82	3121231	2.07		
UPPER LIMIT	2043804	2.32	4369723	2.57		
LOWER LIMIT	1021902	1.32	2184862	1.57		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-198839/1-A		1369139	1.81	2995818	2.07	
LLCS 320-198839/2-A		1404710	1.81	2981543	2.08	
320-33890-1	NAWC-120417-RW-129	1432616	1.81	3056921	2.07	
320-33890-1 LMS	NAWC-120417-RW-129 LMS	1437857	1.81	3052685	2.07	
320-33890-1 LMSD	NAWC-120417-RW-129 LMSD	1432930	1.81	3065161	2.07	

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Sample No.: CCV 320-199060/11 Date Analyzed: 12/08/2017 13:21
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.08_537AA_01 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1464431	1.81	3067130	2.06		
UPPER LIMIT	2050203	2.31	4293982	2.56		
LOWER LIMIT	1025102	1.31	2146991	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-198839/1-A		1369139	1.81	2995818	2.07	
LLCS 320-198839/2-A		1404710	1.81	2981543	2.08	
320-33890-1	NAWC-120417-RW-129	1432616	1.81	3056921	2.07	
320-33890-1 LMS	NAWC-120417-RW-129 LMS	1437857	1.81	3052685	2.07	
320-33890-1 LMSD	NAWC-120417-RW-129 LMSD	1432930	1.81	3065161	2.07	

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Sample No.: CCV 320-199064/4 Date Analyzed: 12/08/2017 13:37
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.08_537AA_01 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1377238	1.81	2882251	2.06		
UPPER LIMIT	1928133	2.31	4035151	2.56		
LOWER LIMIT	964067	1.31	2017576	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-33890-2	NAWC-120417-FRB-129	1384062	1.81	2935444	2.07	
320-33890-3	NAWC-120417-RW-055	1419365	1.81	2983138	2.06	
320-33890-4	NAWC-120417-FRB-055	1359265	1.81	2938862	2.07	
320-33890-5	NAWC-120417-RW-028	1445759	1.81	3090514	2.06	
320-33890-6	NAWC-120417-FRB-028	1405251	1.81	2995330	2.07	
320-33890-7	NAWC-120417-RW-118	1393232	1.81	3037244	2.06	
320-33890-8	NAWC-120417-FRB-118	1399280	1.81	2932875	2.06	
320-33890-9	NAWC-120417-RW-071	1272649	1.81	2667570	2.06	
320-33890-10	NAWC-120417-FRB-071	1389736	1.81	2950821	2.06	
320-33890-11	NAWC-120417-RW-075	1421524	1.81	2926970	2.06	

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Sample No.: CCV 320-199064/16 Date Analyzed: 12/08/2017 14:33
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.08_537AA_02 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1389631	1.81	3085685	2.06		
UPPER LIMIT	1945483	2.31	4319959	2.56		
LOWER LIMIT	972742	1.31	2159980	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-33890-2	NAWC-120417-FRB-129	1384062	1.81	2935444	2.07	
320-33890-3	NAWC-120417-RW-055	1419365	1.81	2983138	2.06	
320-33890-4	NAWC-120417-FRB-055	1359265	1.81	2938862	2.07	
320-33890-5	NAWC-120417-RW-028	1445759	1.81	3090514	2.06	
320-33890-6	NAWC-120417-FRB-028	1405251	1.81	2995330	2.07	
320-33890-7	NAWC-120417-RW-118	1393232	1.81	3037244	2.06	
320-33890-8	NAWC-120417-FRB-118	1399280	1.81	2932875	2.06	
320-33890-9	NAWC-120417-RW-071	1272649	1.81	2667570	2.06	
320-33890-10	NAWC-120417-FRB-071	1389736	1.81	2950821	2.06	
320-33890-11	NAWC-120417-RW-075	1421524	1.81	2926970	2.06	

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Sample No.: CCV 320-199066/16 Date Analyzed: 12/08/2017 14:33
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.08_537AA_02 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1389631	1.81	3085685	2.06		
UPPER LIMIT	1945483	2.31	4319959	2.56		
LOWER LIMIT	972742	1.31	2159980	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-33890-12	NAWC-120417-FRB-075	1255016	1.81	2594570	2.06	
320-33890-13	WGNA-120417-DUP13	1427376	1.80	2970166	2.06	

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Sample No.: CCV 320-199066/20 Date Analyzed: 12/08/2017 14:52
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.08_537AA_03 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1386851	1.81	2971857	2.06		
UPPER LIMIT	1941591	2.31	4160600	2.56		
LOWER LIMIT	970796	1.31	2080300	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-33890-12	NAWC-120417-FRB-075	1255016	1.81	2594570	2.06	
320-33890-13	WGNA-120417-DUP13	1427376	1.80	2970166	2.06	

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

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

Column used to flag values outside QC limits

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-129 Lab Sample ID: 320-33890-1
 Matrix: Water Lab File ID: 2017.12.08_537AA_006.d
 Analysis Method: 537 Date Collected: 12/04/2017 10:10
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 247.6(mL) Date Analyzed: 12/08/2017 12:58
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199060 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.2	J M	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	6.5	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)	2.0	J M	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	98		70-130
STL00996	13C2 PFDA	97		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51541.b\2017.12.08_537AA_006.d
 Lims ID: 320-33890-A-1-A
 Client ID: NAWC-120417-RW-129
 Sample Type: Client
 Inject. Date: 08-Dec-2017 12:58:30 ALS Bottle#: 32 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-A-1-A
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51541.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Dec-2017 13:59:18 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: XAWRK008

First Level Reviewer: phomsophat Date: 08-Dec-2017 13:54:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.366	1.444	-0.078	1.000	84538	0.7093		129	
298.90 > 99.00	1.366	1.444	-0.078	1.000	57969		1.46(0.00-0.00)	129	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.573	-0.094	1.000	1537200	9.75		8950	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.725	-0.101	1.000	139342	0.7809		183	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.725	-0.101	1.000	66006	0.4918		18.5	M
* 6 13C2-PFOA									
415.00 > 370.00	1.813	1.913	-0.100		1432616	10.0		8689	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.813	1.914	-0.101	1.000	212870	1.61		50.7	
413.00 > 169.00	1.813	1.914	-0.101	1.000	123983		1.72(0.00-0.00)	284	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.071	2.064	0.007	1.000	228202	2.28		106	M
499.00 > 99.00	2.071	2.064	0.007	1.000	42199		5.41(0.00-0.00)	113	M
* 7 13C4 PFOS									
503.00 > 80.00	2.071	2.151	-0.080		3056921	28.7		6157	
9 Perfluorononanoic acid									
463.00 > 419.00	2.079	2.158	-0.079	1.000	26521	0.2787		7.5	M
\$ 10 13C2 PFDA									
515.00 > 470.00	2.253	2.312	-0.059	1.000	1067935	9.74		8464	

QC Flag Legend

Review Flags

M - Manually Integrated

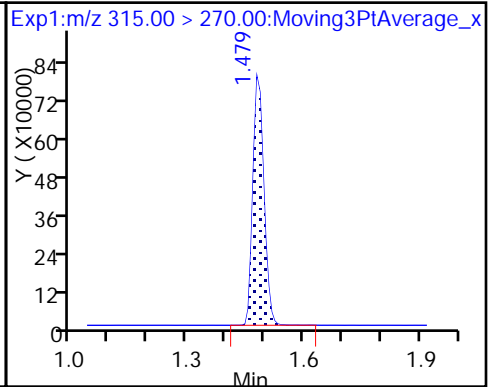
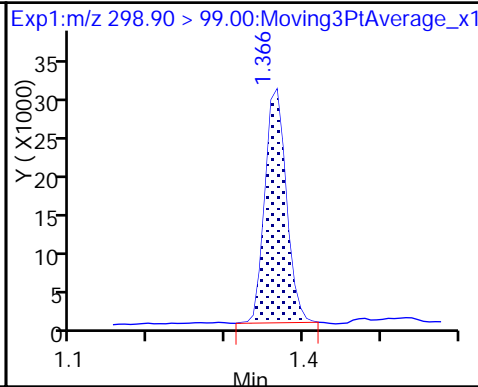
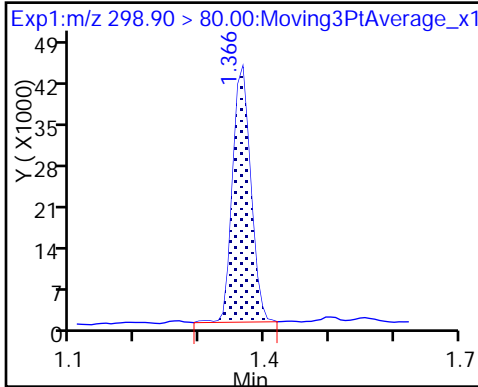
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51541.b\2017.12.08_537AA_006.d
Injection Date: 08-Dec-2017 12:58:30 Instrument ID: A8_N
Lims ID: 320-33890-A-1-A Lab Sample ID: 320-33890-1
Client ID: NAWC-120417-RW-129
Operator ID: SACINSTLCMS01 ALS Bottle#: 32 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

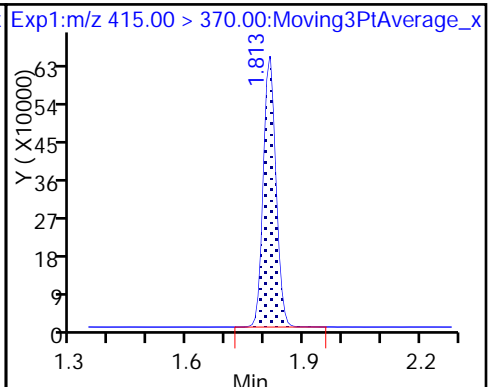
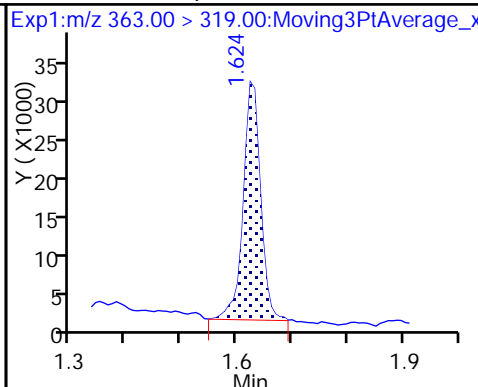
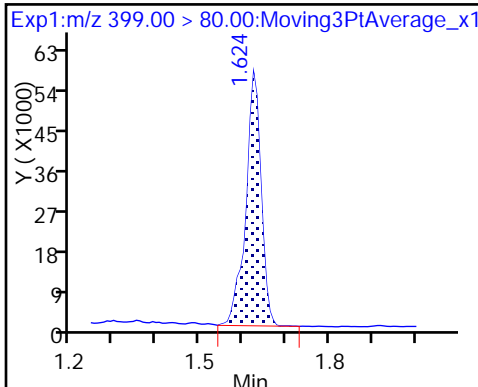
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid (M)

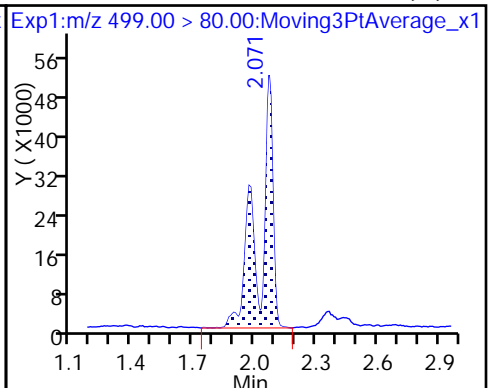
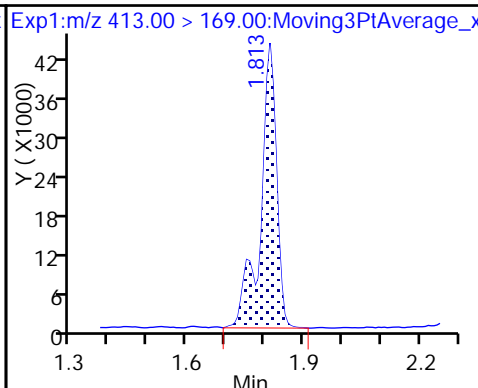
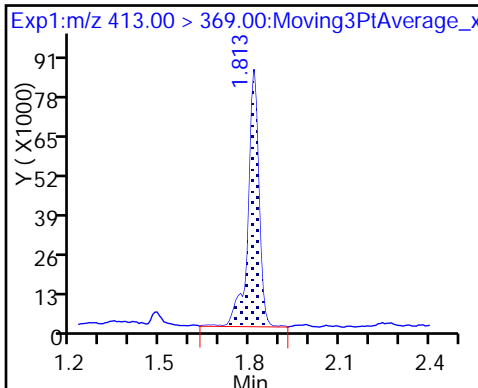
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

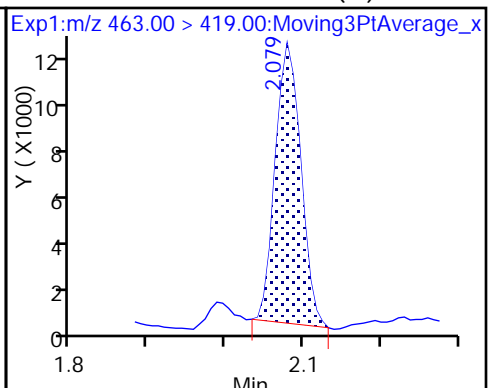
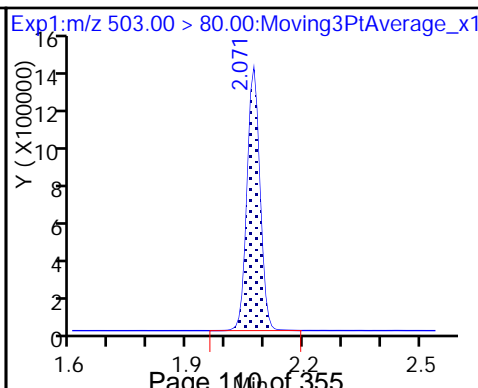
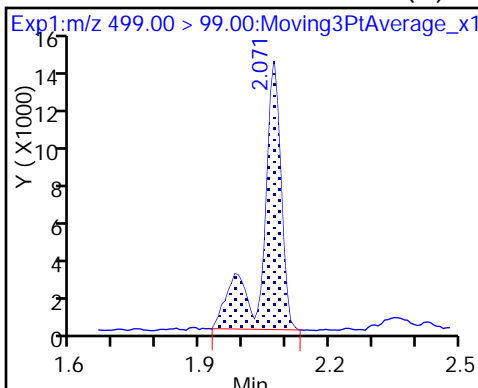
8 Perfluorooctane sulfonic acid (M)



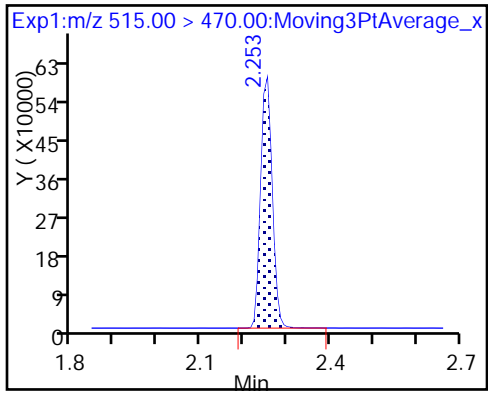
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51541.b\2017.12.08_537AA_006.d
 Lims ID: 320-33890-A-1-A
 Client ID: NAWC-120417-RW-129
 Sample Type: Client
 Inject. Date: 08-Dec-2017 12:58:30 ALS Bottle#: 32 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-A-1-A
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51541.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Dec-2017 13:59:18 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: XAWRK008

First Level Reviewer: phomsophat Date: 08-Dec-2017 13:54:35

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.75	97.52
\$ 10 13C2 PFDA	10.0	9.74	97.42

TestAmerica Sacramento

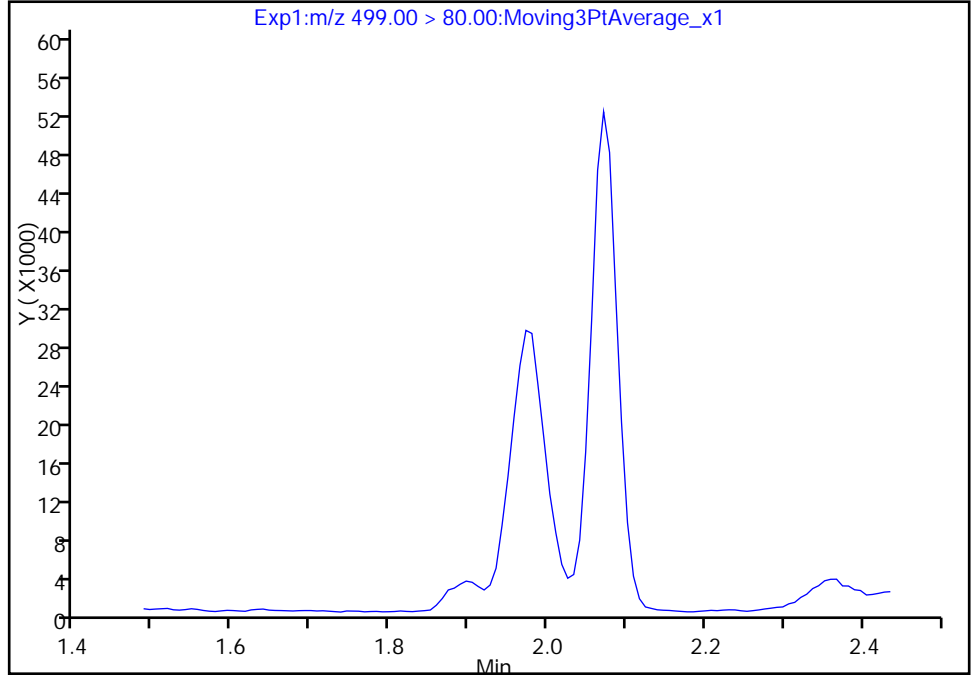
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Injection Date: 08-Dec-2017 12:58:30 Instrument ID: A8_N
Lims ID: 320-33890-A-1-A Lab Sample ID: 320-33890-1
Client ID: NAWC-120417-RW-129
Operator ID: SACINSTLCMS01 ALS Bottle#: 32 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

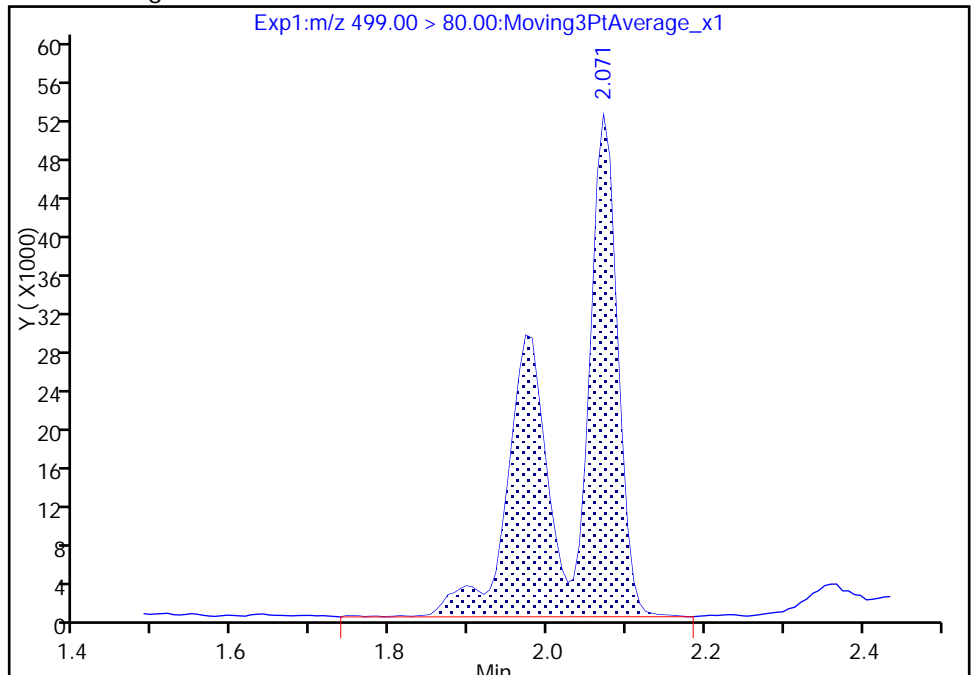
Not Detected
Expected RT: 2.06

Processing Integration Results



RT: 2.07
Area: 228202
Amount: 2.280198
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

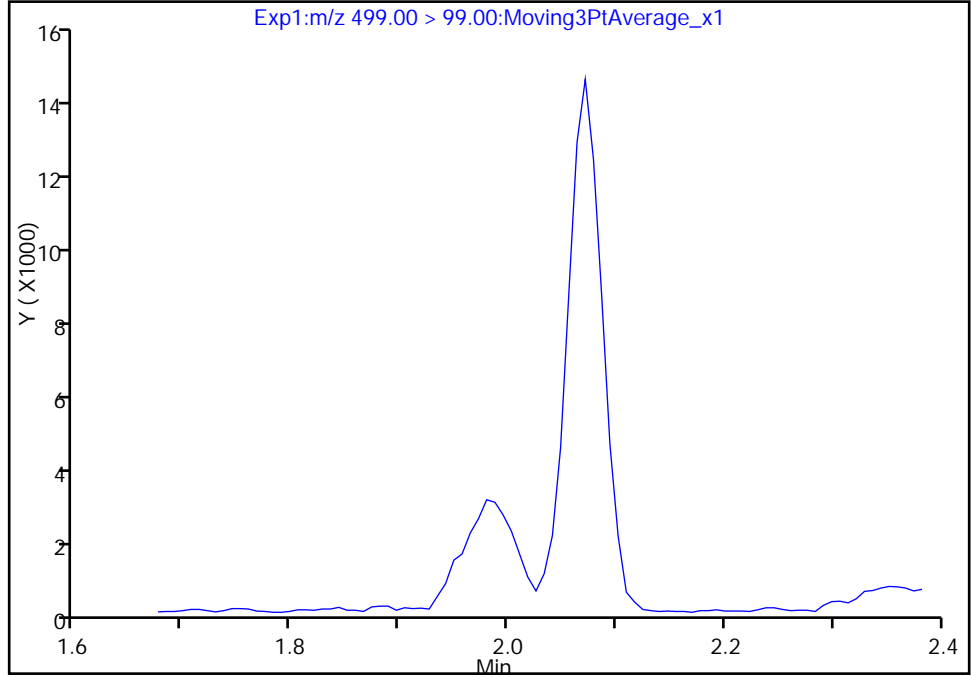
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Injection Date: 08-Dec-2017 12:58:30 Instrument ID: A8_N
Lims ID: 320-33890-A-1-A Lab Sample ID: 320-33890-1
Client ID: NAWC-120417-RW-129
Operator ID: SACINSTLCMS01 ALS Bottle#: 32 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

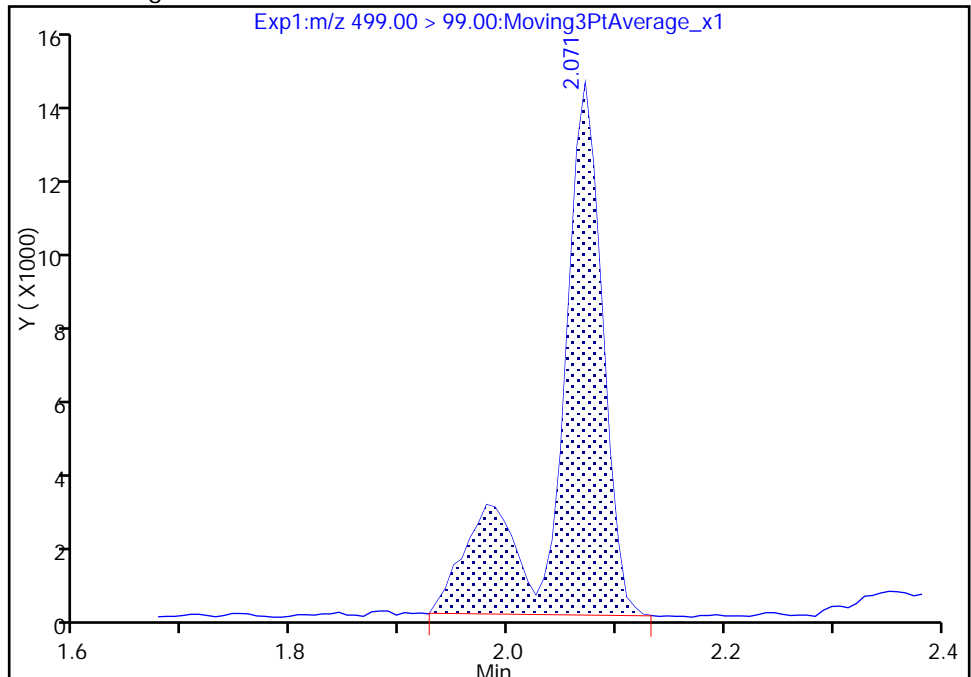
Not Detected
Expected RT: 2.06

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 42199
Amount: 2.280198
Amount Units: ng/ml



TestAmerica Sacramento

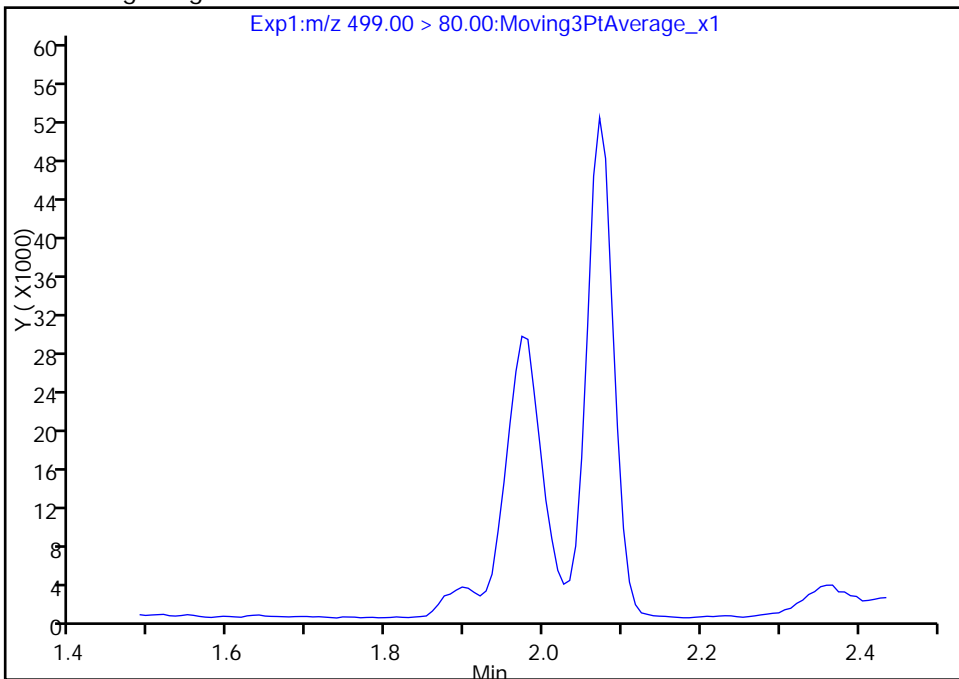
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51541.b\2017.12.08_537AA_006.d
Injection Date: 08-Dec-2017 12:58:30 Instrument ID: A8_N
Lims ID: 320-33890-A-1-A Lab Sample ID: 320-33890-1
Client ID: NAWC-120417-RW-129
Operator ID: SACINSTLCMS01 ALS Bottle#: 32 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

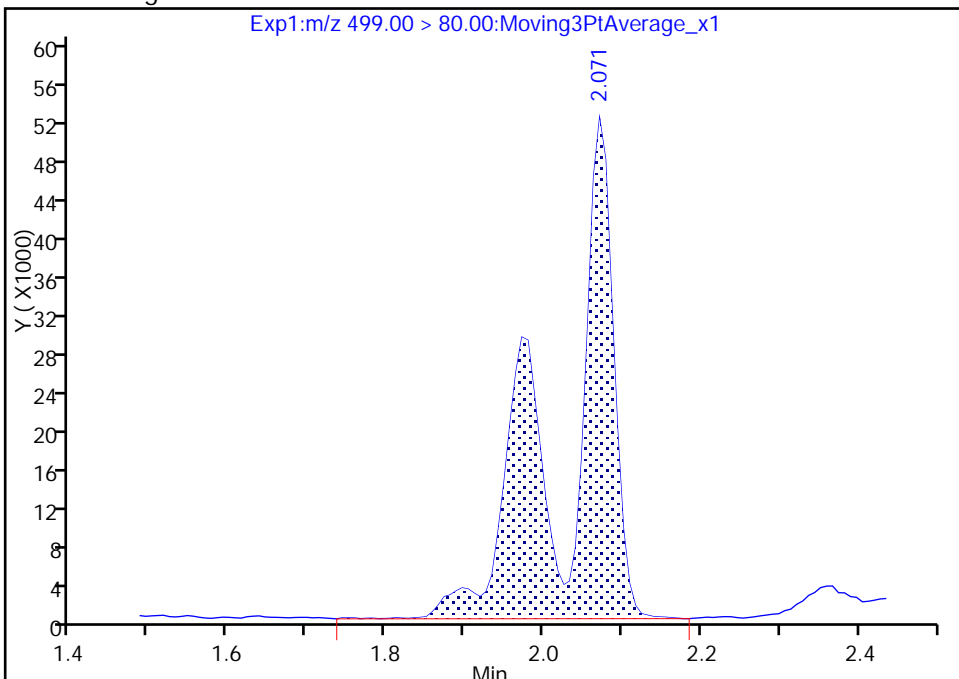
Not Detected
Expected RT: 2.06

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 228202
Amount: 2.280198
Amount Units: ng/ml



TestAmerica Sacramento

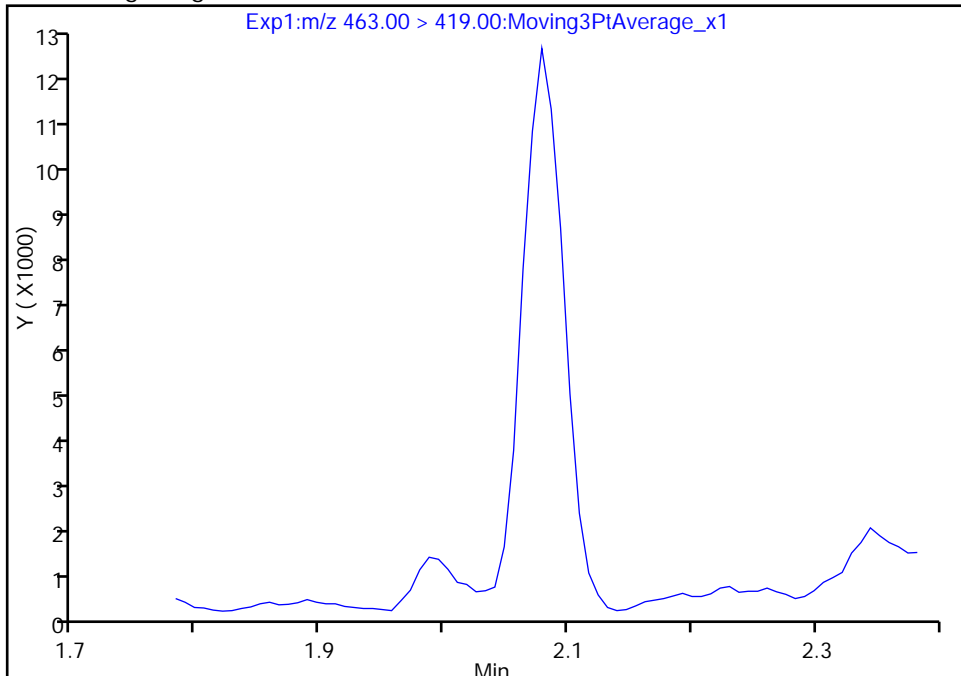
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Injection Date: 08-Dec-2017 12:58:30 Instrument ID: A8_N
Lims ID: 320-33890-A-1-A Lab Sample ID: 320-33890-1
Client ID: NAWC-120417-RW-129
Operator ID: SACINSTLCMS01 ALS Bottle#: 32 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

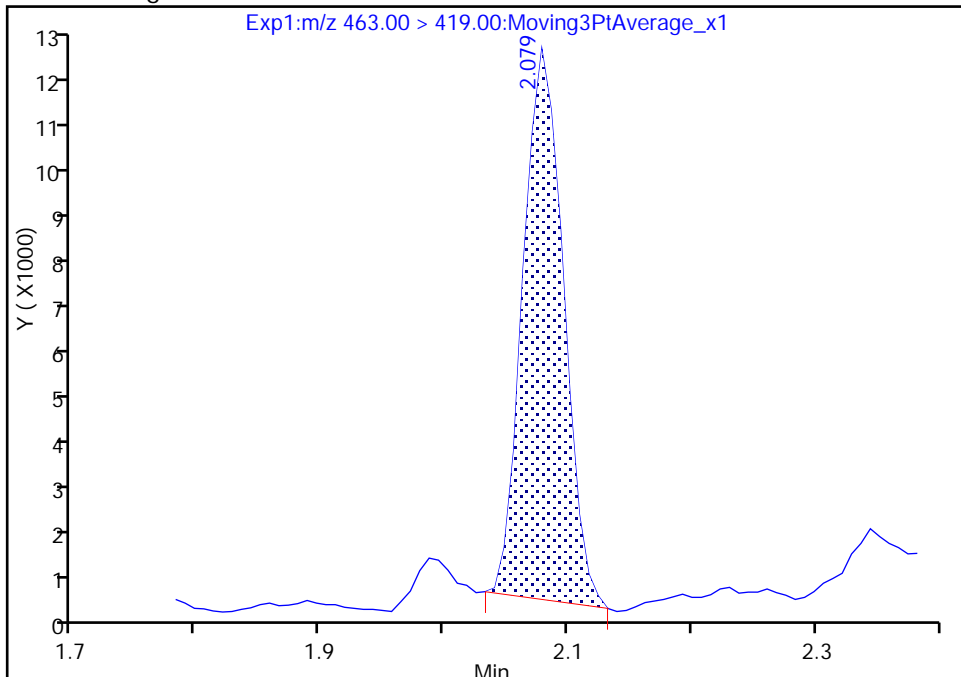
Not Detected
Expected RT: 2.16

Processing Integration Results



Manual Integration Results

RT: 2.08
Area: 26521
Amount: 0.278732
Amount Units: ng/ml



TestAmerica Sacramento

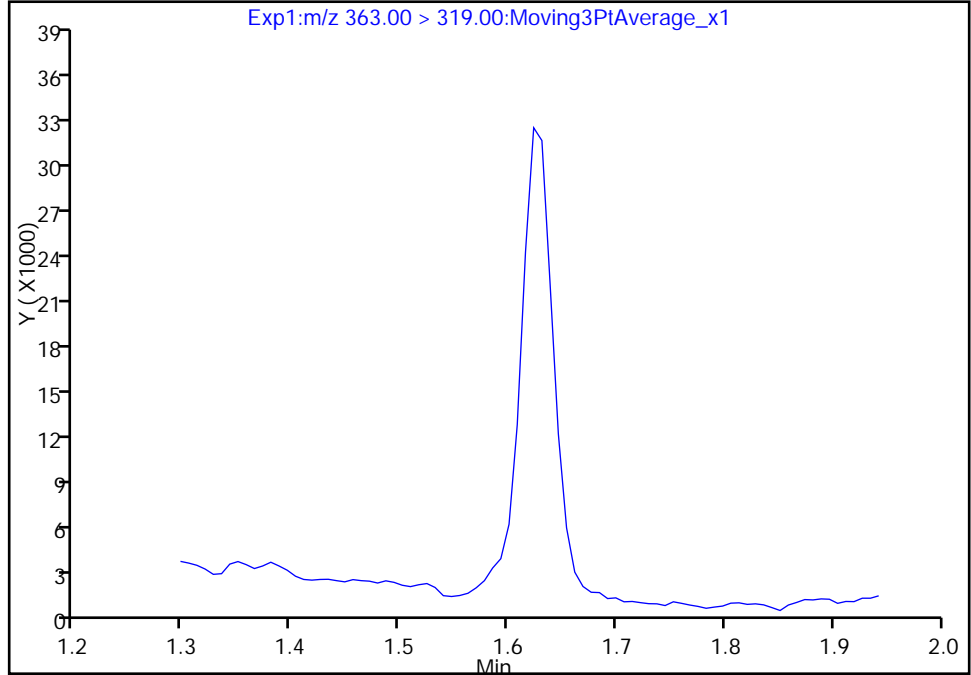
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Injection Date: 08-Dec-2017 12:58:30 Instrument ID: A8_N
Lims ID: 320-33890-A-1-A Lab Sample ID: 320-33890-1
Client ID: NAWC-120417-RW-129
Operator ID: SACINSTLCMS01 ALS Bottle#: 32 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

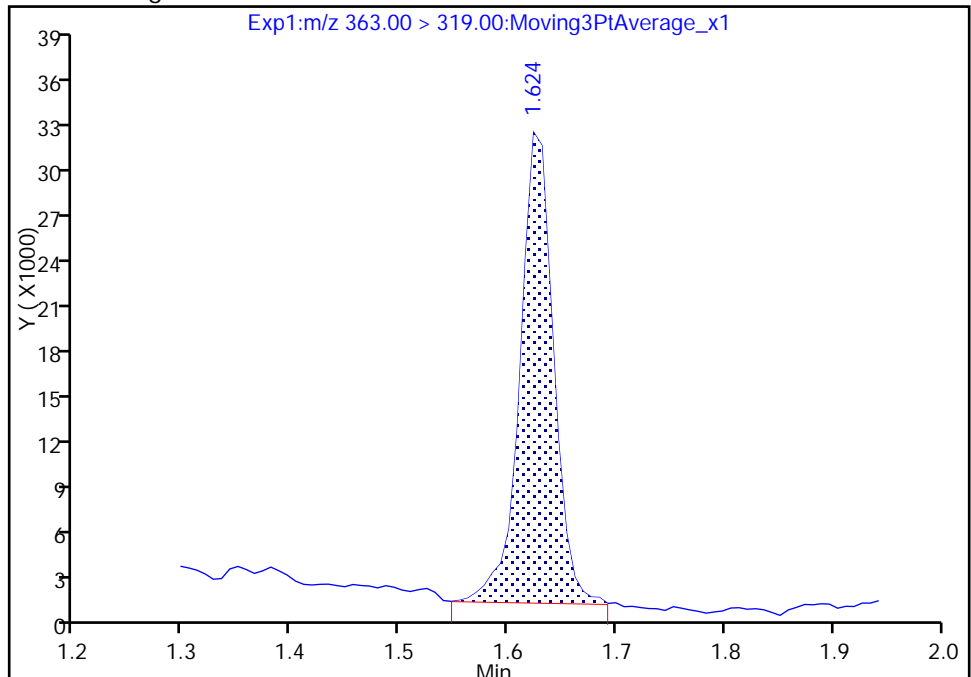
Not Detected
Expected RT: 1.72

Processing Integration Results



Manual Integration Results

RT: 1.62
Area: 66006
Amount: 0.491760
Amount Units: ng/ml



TestAmerica Sacramento

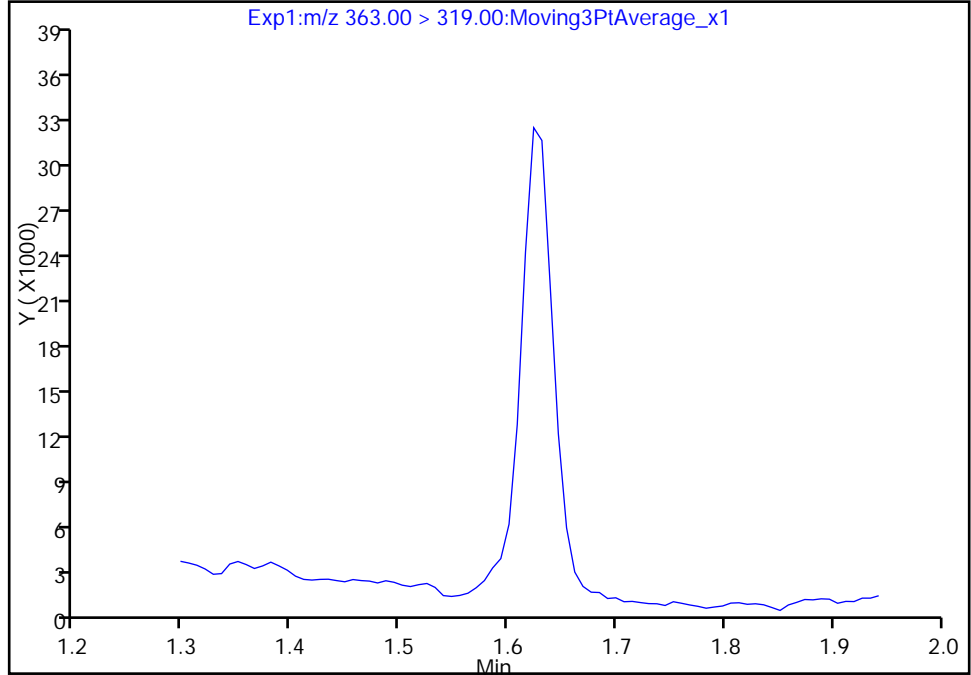
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51541.b\2017.12.08_537AA_006.d
Injection Date: 08-Dec-2017 12:58:30 Instrument ID: A8_N
Lims ID: 320-33890-A-1-A Lab Sample ID: 320-33890-1
Client ID: NAWC-120417-RW-129
Operator ID: SACINSTLCMS01 ALS Bottle#: 32 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

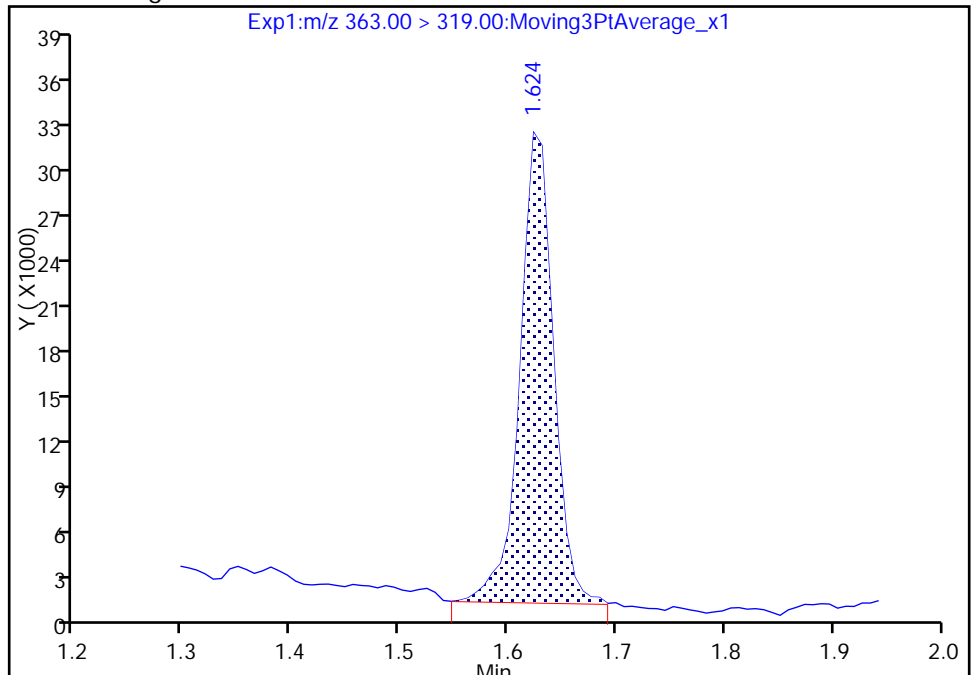
Not Detected
Expected RT: 1.72

Processing Integration Results



Manual Integration Results

RT: 1.62
Area: 66006
Amount: 0.491760
Amount Units: ng/ml



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-129 Lab Sample ID: 320-33890-2
 Matrix: Water Lab File ID: 2017.12.08_537AA_016.d
 Analysis Method: 537 Date Collected: 12/04/2017 10:05
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 247.1(mL) Date Analyzed: 12/08/2017 13:46
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	93		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_016.d
 Lims ID: 320-33890-A-2-A
 Client ID: NAWC-120417-FRB-129
 Sample Type: Client
 Inject. Date: 08-Dec-2017 13:46:38 ALS Bottle#: 37 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-2-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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

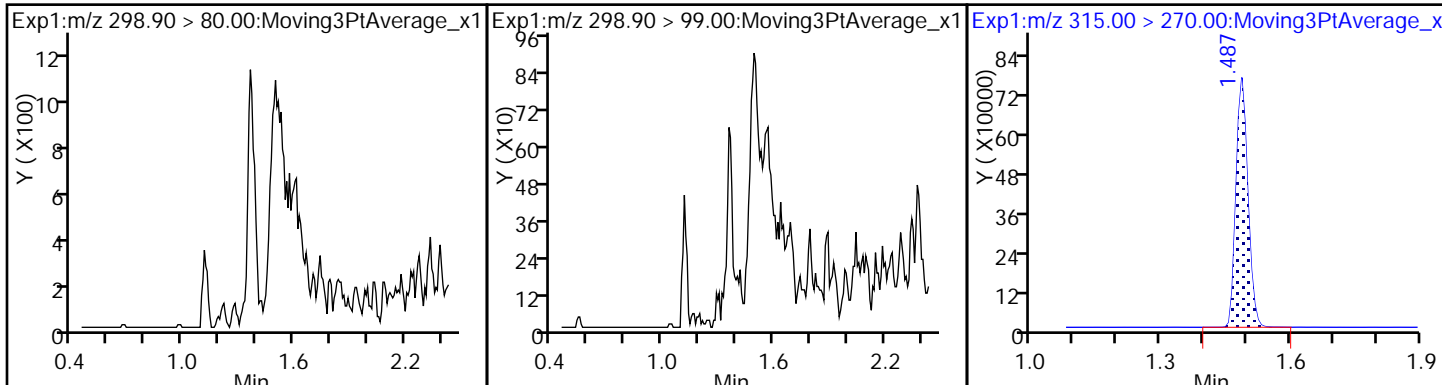
Column 1 : Det: EXP1
 Process Host: XAWRK015

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.487	1.573	-0.086	1.000	1449529	9.52	8332	
* 6 13C2-PFOA	415.00 > 370.00	1.813	1.913	-0.100		1384062	10.0	7528	
* 7 13C4 PFOS	503.00 > 80.00	2.071	2.151	-0.080		2935444	28.7	8187	
\$ 10 13C2 PFDA	515.00 > 470.00	2.253	2.312	-0.059	1.000	989880	9.35	8763	

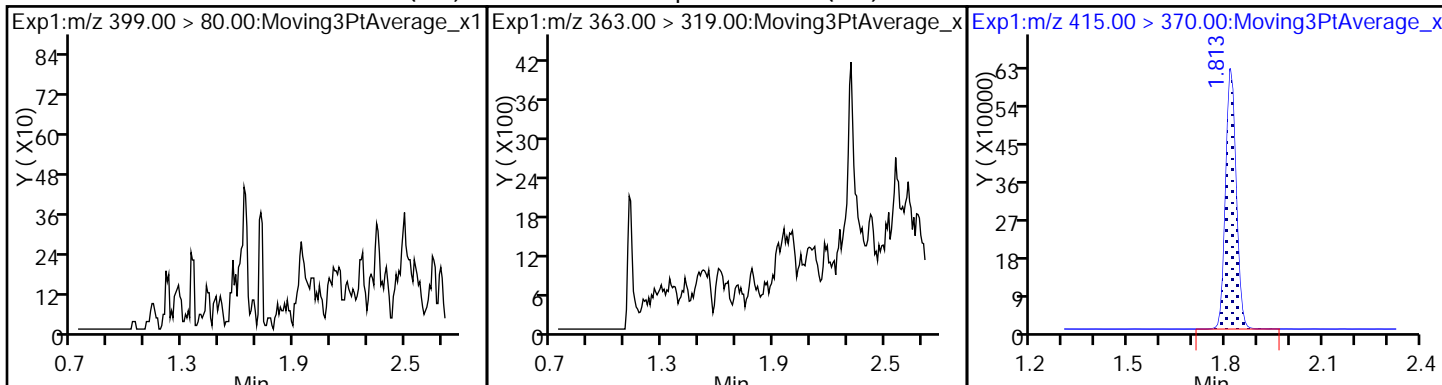
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_016.d
Injection Date: 08-Dec-2017 13:46:38 Instrument ID: A8_N
Lims ID: 320-33890-A-2-A Lab Sample ID: 320-33890-2
Client ID: NAWC-120417-FRB-129
Operator ID: SACINSTLCMS01 ALS Bottle#: 37 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

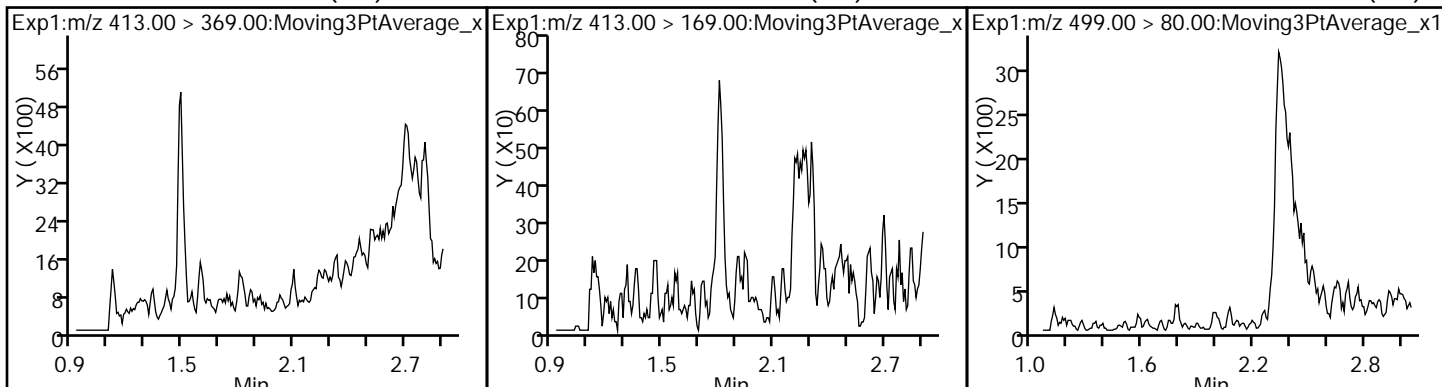
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



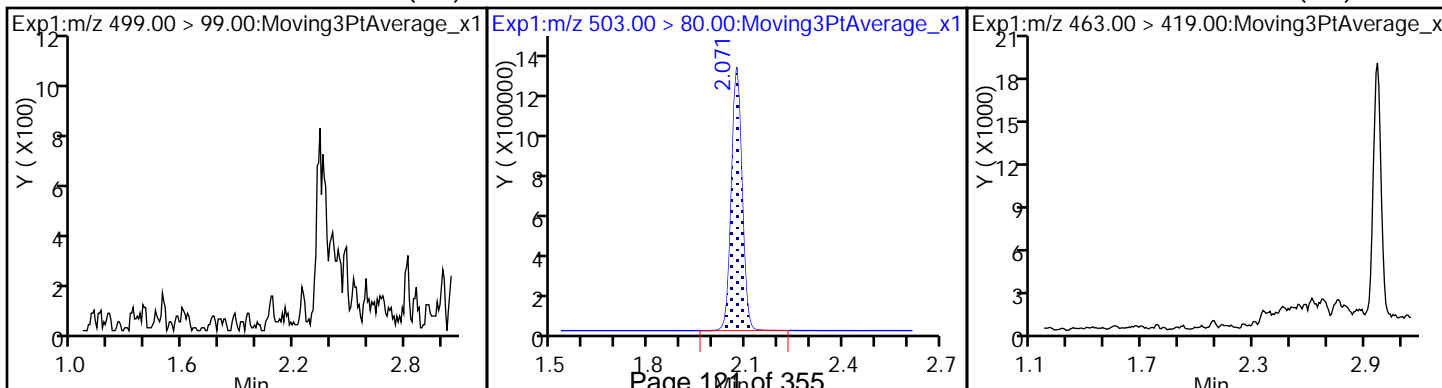
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



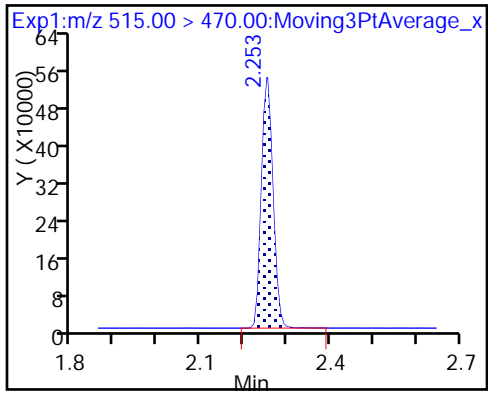
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) 8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS 9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_016.d
 Lims ID: 320-33890-A-2-A
 Client ID: NAWC-120417-FRB-129
 Sample Type: Client
 Inject. Date: 08-Dec-2017 13:46:38 ALS Bottle#: 37 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-2-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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: XAWRK015

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.52	95.18
\$ 10 13C2 PFDA	10.0	9.35	93.47

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-055 Lab Sample ID: 320-33890-3
 Matrix: Water Lab File ID: 2017.12.08_537AA_017.d
 Analysis Method: 537 Date Collected: 12/04/2017 10:40
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 249.4 (mL) Date Analyzed: 12/08/2017 13:51
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 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)	3.8	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)	4.0	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	96		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_017.d
 Lims ID: 320-33890-A-3-A
 Client ID: NAWC-120417-RW-055
 Sample Type: Client
 Inject. Date: 08-Dec-2017 13:51:19 ALS Bottle#: 38 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-3-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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: XAWRK015

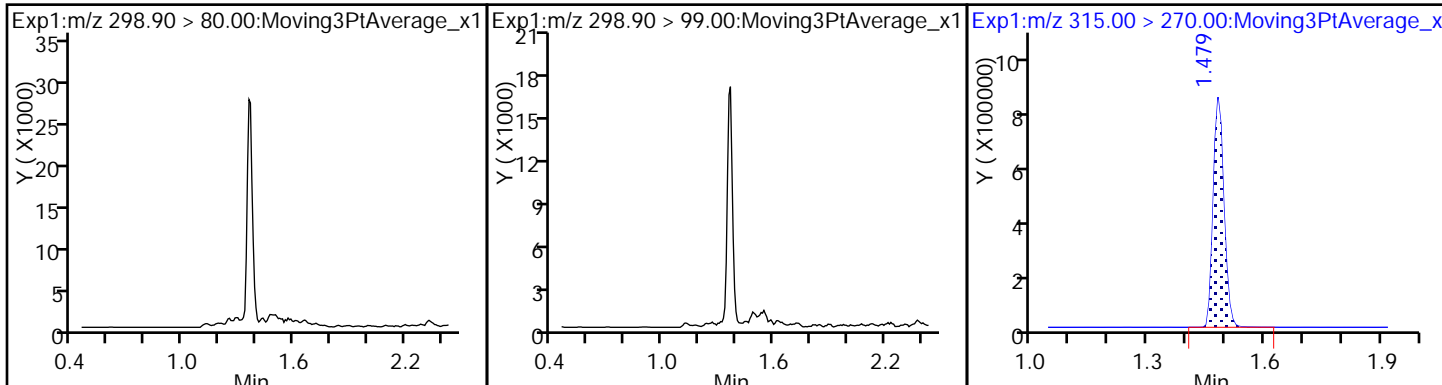
First Level Reviewer: barnettj Date: 11-Dec-2017 09:56:00

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.479	1.573	-0.094	1.000	1566772	10.0	10321	
* 6 13C2-PFOA	415.00 > 370.00	1.806	1.913	-0.107		1419365	10.0	7687	
5 Perfluorooctanoic acid	413.00 > 369.00	1.806	1.914	-0.108	1.000	125136	0.9523	31.5	
	413.00 > 169.00	1.806	1.914	-0.108	1.000	72483	1.73(0.00-0.00)	176	
8 Perfluorooctane sulfonic acid	499.00 > 80.00	2.064	2.064	0.0	1.000	63747	0.6527	28.6	
	499.00 > 99.00	2.064	2.064	0.0	1.000	11999	5.31(0.00-0.00)	28.1	
* 7 13C4 PFOS	503.00 > 80.00	2.064	2.151	-0.087		2983138	28.7	6997	
\$ 10 13C2 PFDA	515.00 > 470.00	2.246	2.312	-0.066	1.000	1043731	9.61	7706	

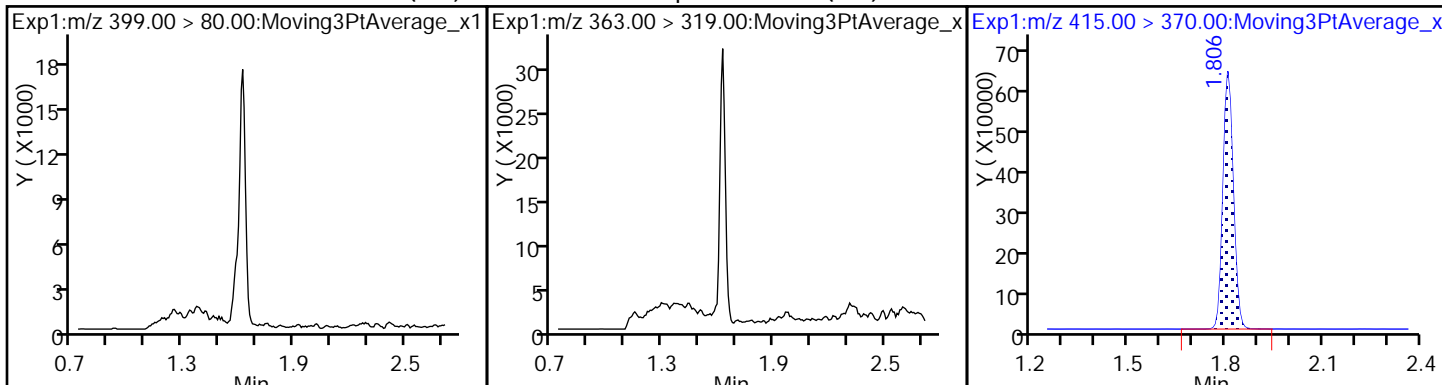
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_017.d
Injection Date: 08-Dec-2017 13:51:19 Instrument ID: A8_N
Lims ID: 320-33890-A-3-A Lab Sample ID: 320-33890-3
Client ID: NAWC-120417-RW-055
Operator ID: SACINSTLCMS01 ALS Bottle#: 38 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

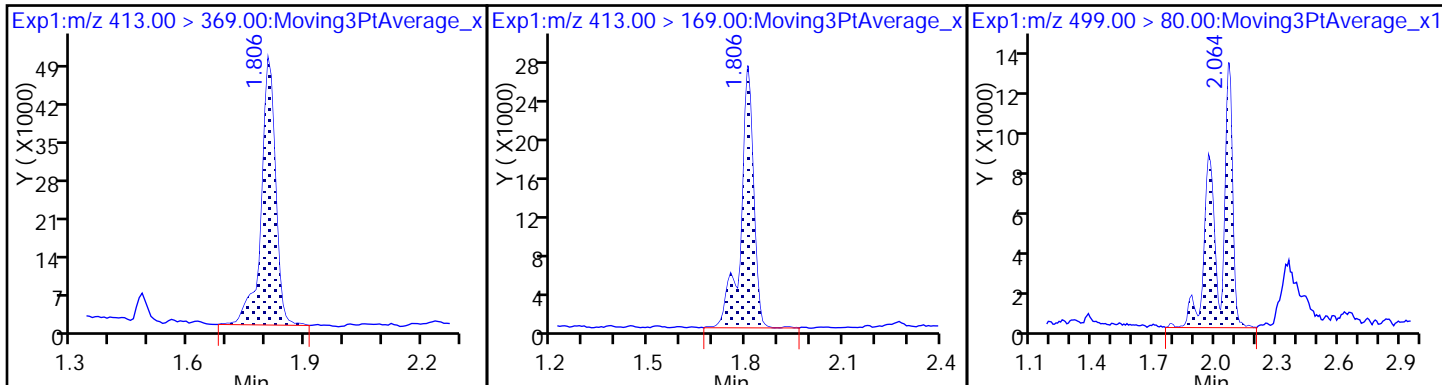
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



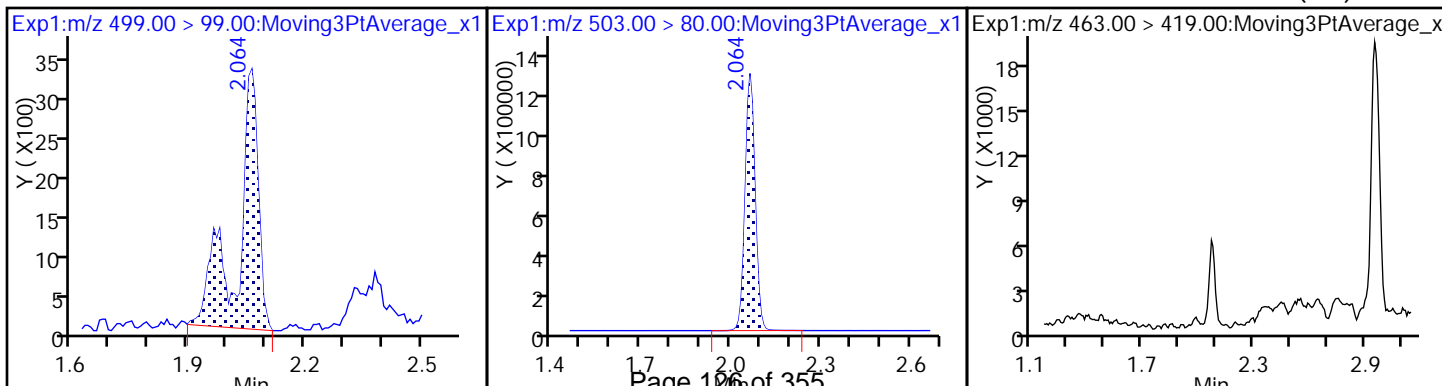
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



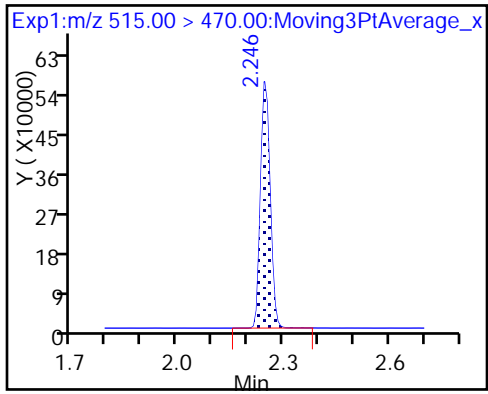
5 Perfluorooctanoic acid 5 Perfluorooctanoic acid 8 Perfluorooctane sulfonic acid



8 Perfluorooctane sulfonic acid * 7 13C4 PFOS 9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_017.d
 Lims ID: 320-33890-A-3-A
 Client ID: NAWC-120417-RW-055
 Sample Type: Client
 Inject. Date: 08-Dec-2017 13:51:19 ALS Bottle#: 38 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-3-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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: XAWRK015

First Level Reviewer: barnettj Date: 11-Dec-2017 09:56:00

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.0	100.32
\$ 10 13C2 PFDA	10.0	9.61	96.10

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-055 Lab Sample ID: 320-33890-4
 Matrix: Water Lab File ID: 2017.12.08_537AA_018.d
 Analysis Method: 537 Date Collected: 12/04/2017 10:35
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 250.2 (mL) Date Analyzed: 12/08/2017 13:55
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 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	96		70-130
STL00996	13C2 PFDA	95		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_018.d
 Lims ID: 320-33890-A-4-A
 Client ID: NAWC-120417-FRB-055
 Sample Type: Client
 Inject. Date: 08-Dec-2017 13:55:59 ALS Bottle#: 39 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-4-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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

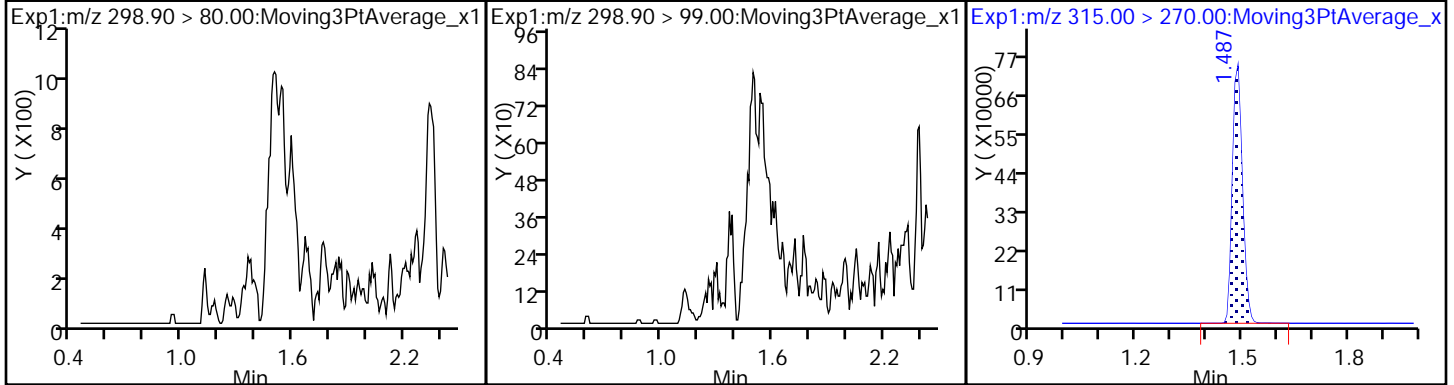
Column 1 : Det: EXP1
 Process Host: XAWRK015

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.487	1.573	-0.086	1.000	1431074	9.57	10499	
* 6 13C2-PFOA	415.00 > 370.00	1.813	1.913	-0.100		1359265	10.0	8921	
* 7 13C4 PFOS	503.00 > 80.00	2.071	2.151	-0.080		2938862	28.7	8227	
\$ 10 13C2 PFDA	515.00 > 470.00	2.253	2.312	-0.059	1.000	987377	9.49	7660	

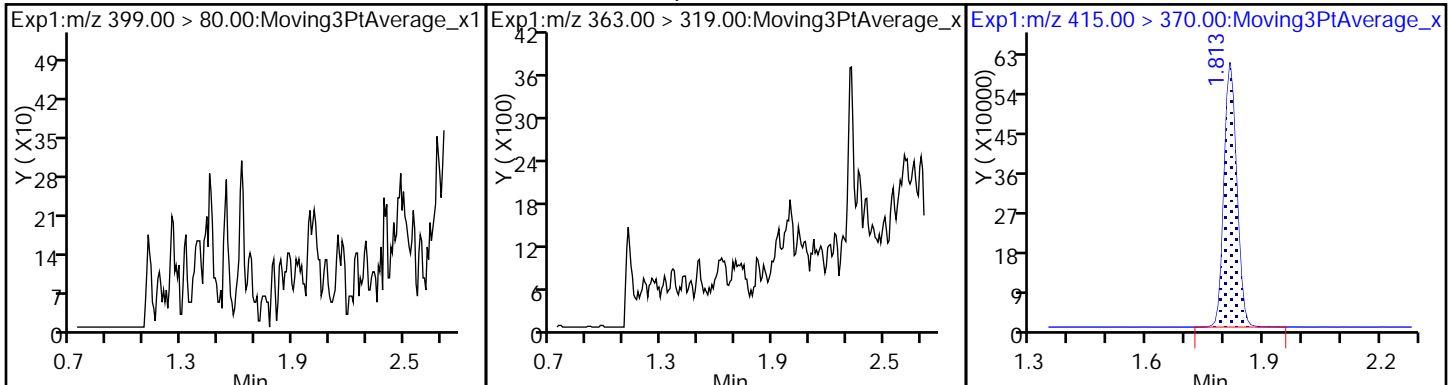
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_018.d
Injection Date: 08-Dec-2017 13:55:59 Instrument ID: A8_N
Lims ID: 320-33890-A-4-A Lab Sample ID: 320-33890-4
Client ID: NAWC-120417-FRB-055
Operator ID: SACINSTLCMS01 ALS Bottle#: 39 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

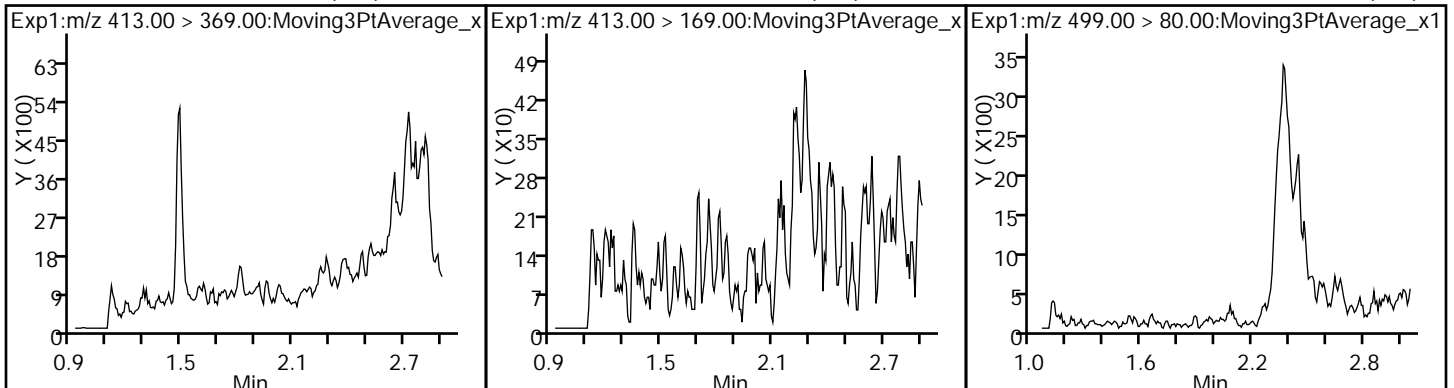
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



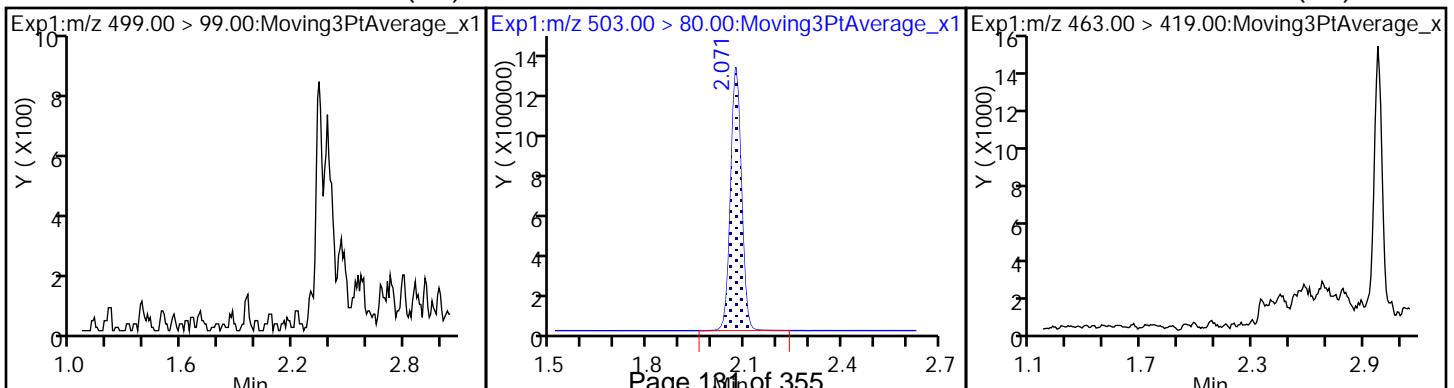
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



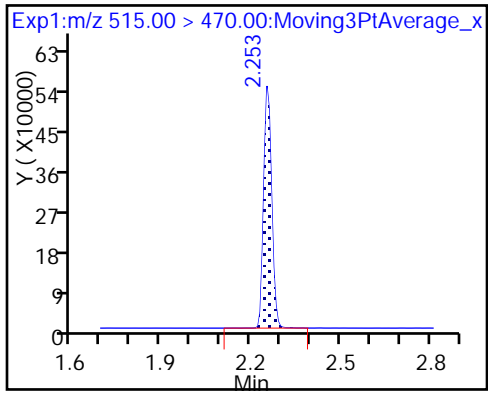
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) 8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS 9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_018.d
 Lims ID: 320-33890-A-4-A
 Client ID: NAWC-120417-FRB-055
 Sample Type: Client
 Inject. Date: 08-Dec-2017 13:55:59 ALS Bottle#: 39 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-4-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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: XAWRK015

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.57	95.69
\$ 10 13C2 PFDA	10.0	9.49	94.93

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-028 Lab Sample ID: 320-33890-5
 Matrix: Water Lab File ID: 2017.12.08_537AA_019.d
 Analysis Method: 537 Date Collected: 12/04/2017 11:10
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 249.7(mL) Date Analyzed: 12/08/2017 14:00
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	15	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)	7.6	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5	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	91		70-130
STL00996	13C2 PFDA	96		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_019.d
 Lims ID: 320-33890-A-5-A
 Client ID: NAWC-120417-RW-028
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:00:40 ALS Bottle#: 40 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-5-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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: XAWRK015

First Level Reviewer: barnettj Date: 11-Dec-2017 09:56:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.366	1.444	-0.078	1.000	211580	1.76		241	
298.90 > 99.00	1.366	1.444	-0.078	1.000	145641		1.45(0.00-0.00)	323	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.573	-0.094	1.000	1455055	9.15		9510	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.725	-0.101	1.000	343653	1.90		274	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.725	-0.101	1.000	151727	1.12		36.4	
* 6 13C2-PFOA									
415.00 > 370.00	1.806	1.913	-0.107		1445759	10.0		8693	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.813	1.914	-0.101	1.000	486653	3.64		98.3	
413.00 > 169.00	1.813	1.914	-0.101	1.000	294678		1.65(0.00-0.00)	657	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.064	2.064	0.0	1.000	475551	4.70		174	M
499.00 > 99.00	2.064	2.064	0.0	1.000	79426		5.99(0.00-0.00)	161	M
* 7 13C4 PFOS									
503.00 > 80.00	2.064	2.151	-0.087		3090514	28.7		4868	
9 Perfluorononanoic acid									
463.00 > 419.00	2.071	2.158	-0.087	1.000	48624	0.5064		12.3	M
\$ 10 13C2 PFDA									
515.00 > 470.00	2.246	2.312	-0.066	1.000	1066206	9.64		7356	

QC Flag Legend

Review Flags

M - Manually Integrated

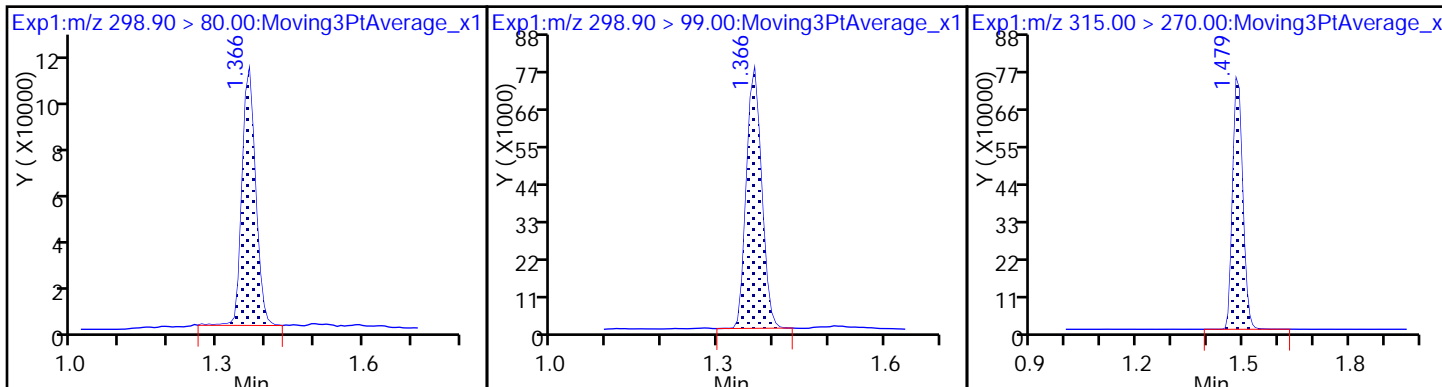
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_019.d
Injection Date: 08-Dec-2017 14:00:40 Instrument ID: A8_N
Lims ID: 320-33890-A-5-A Lab Sample ID: 320-33890-5
Client ID: NAWC-120417-RW-028
Operator ID: SACINSTLCMS01 ALS Bottle#: 40 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

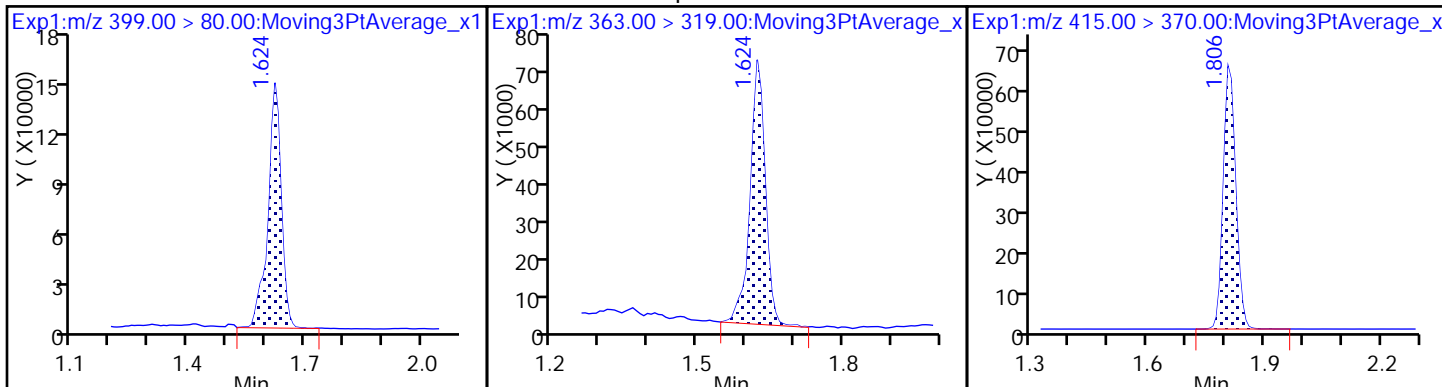
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

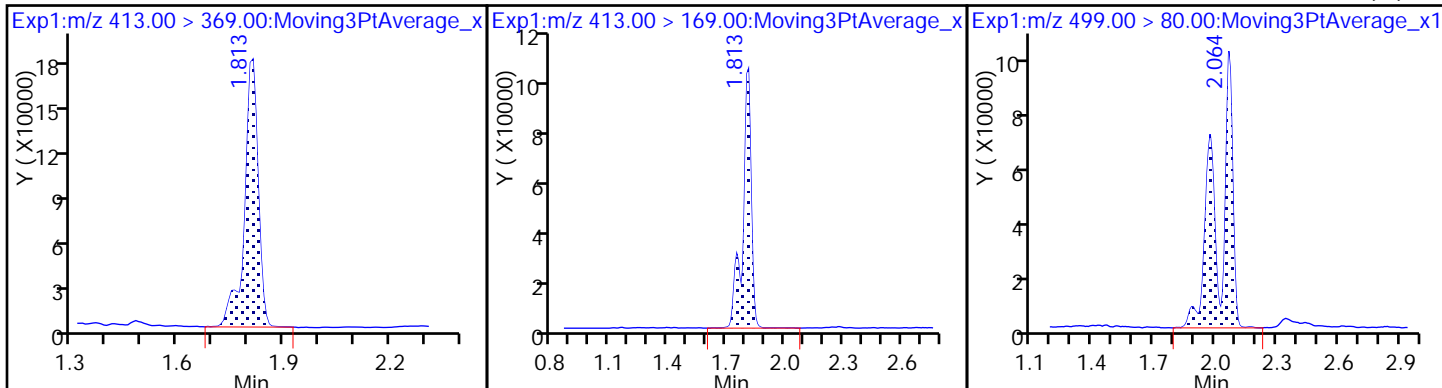
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

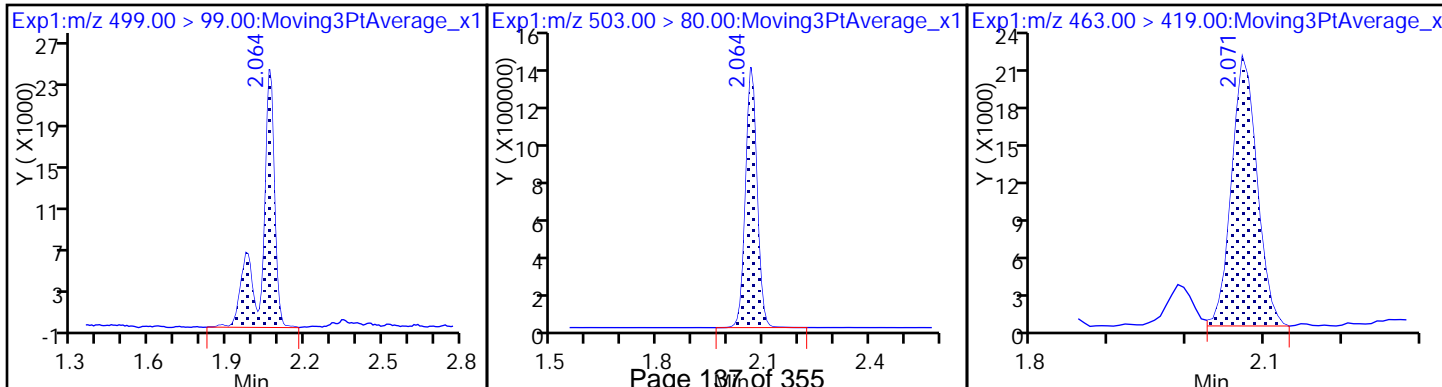
8 Perfluorooctane sulfonic acid (M)



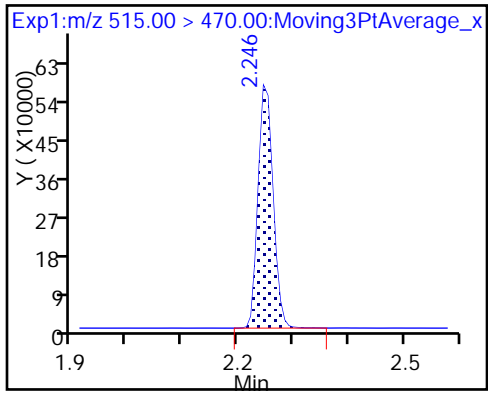
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_019.d
 Lims ID: 320-33890-A-5-A
 Client ID: NAWC-120417-RW-028
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:00:40 ALS Bottle#: 40 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-5-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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: XAWRK015

First Level Reviewer: barnettj Date: 11-Dec-2017 09:56:53

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.15	91.47
\$ 10 13C2 PFDA	10.0	9.64	96.38

TestAmerica Sacramento

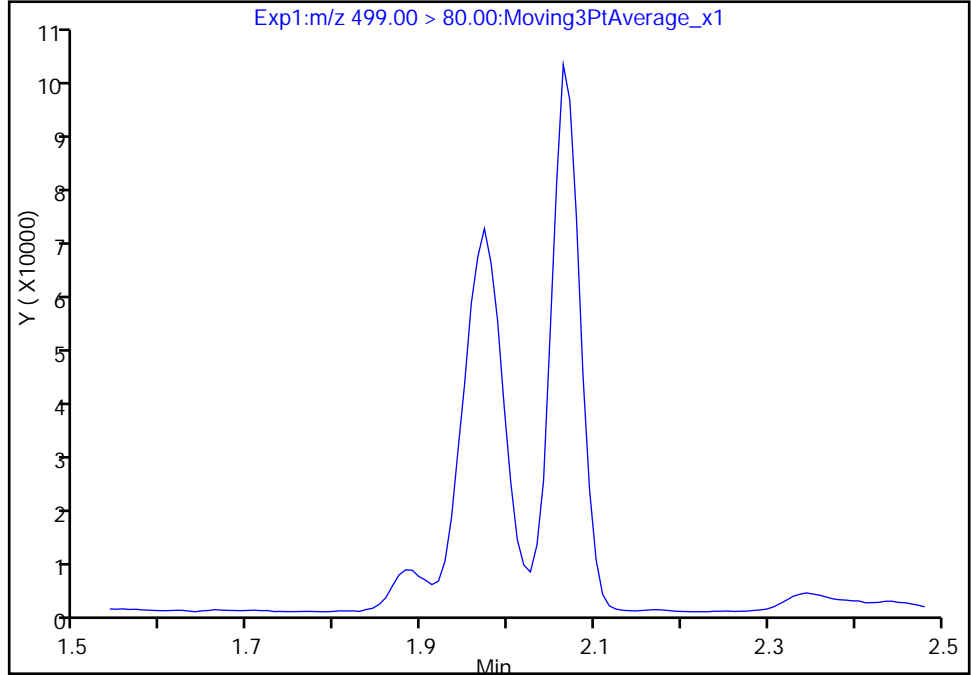
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Injection Date: 08-Dec-2017 14:00:40 Instrument ID: A8_N
Lims ID: 320-33890-A-5-A Lab Sample ID: 320-33890-5
Client ID: NAWC-120417-RW-028
Operator ID: SACINSTLCMS01 ALS Bottle#: 40 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

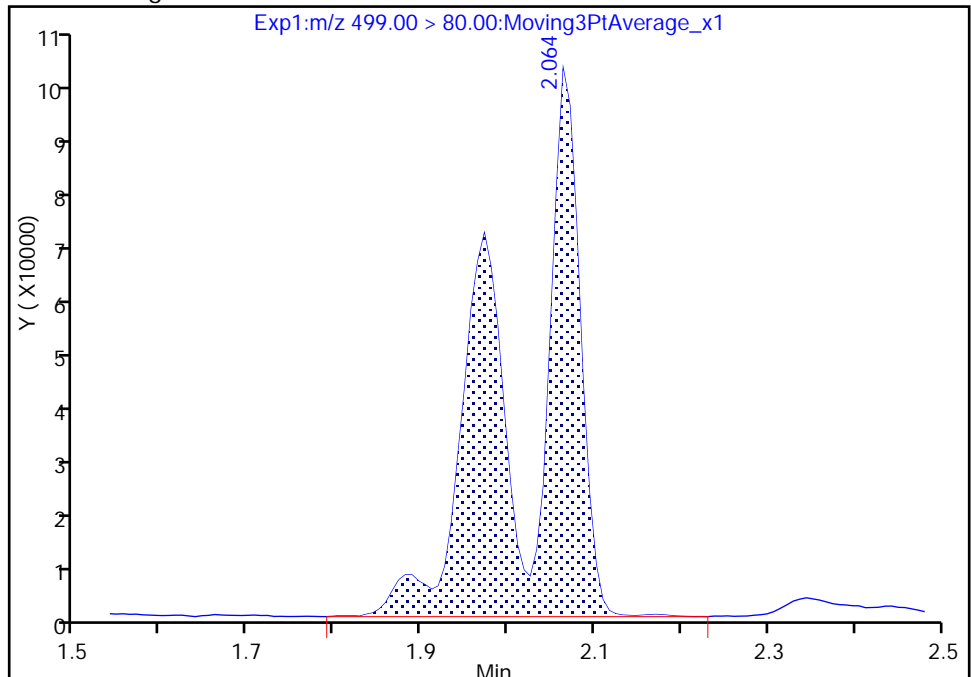
Not Detected
Expected RT: 2.06

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 475551
Amount: 4.700063
Amount Units: ng/ml



TestAmerica Sacramento

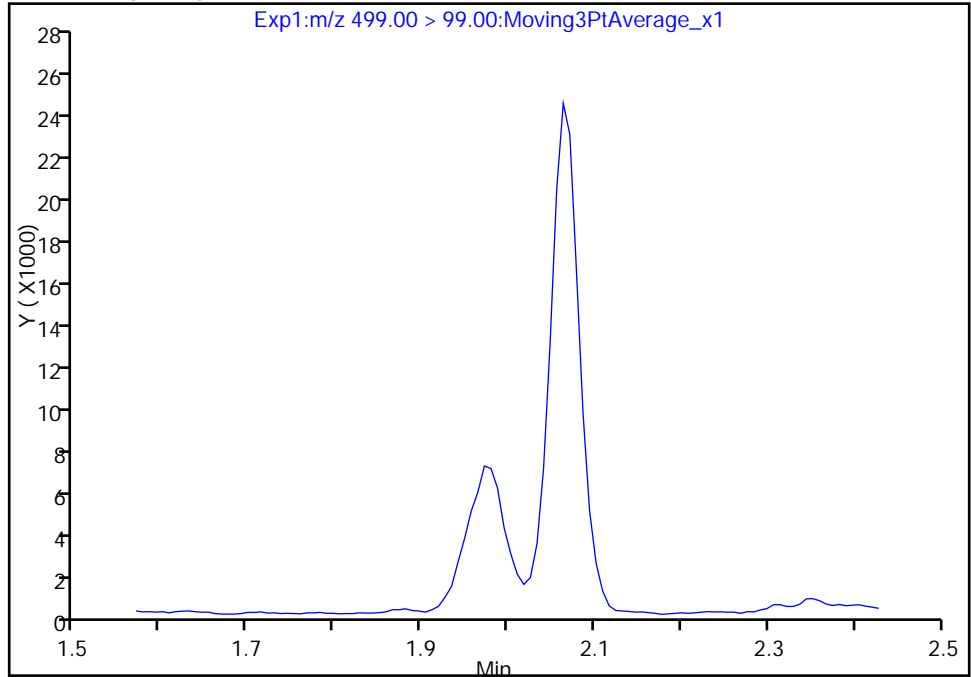
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Injection Date: 08-Dec-2017 14:00:40 Instrument ID: A8_N
Lims ID: 320-33890-A-5-A Lab Sample ID: 320-33890-5
Client ID: NAWC-120417-RW-028
Operator ID: SACINSTLCMS01 ALS Bottle#: 40 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

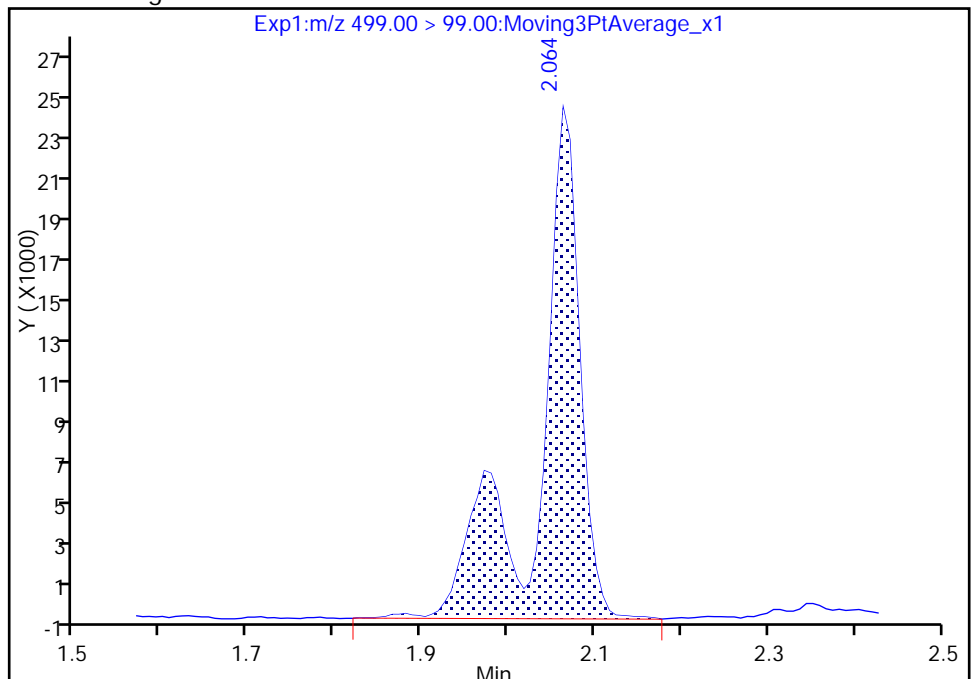
Not Detected
Expected RT: 2.06

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 79426
Amount: 4.700063
Amount Units: ng/ml



Reviewer: barnettj, 11-Dec-2017 09:56:27

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

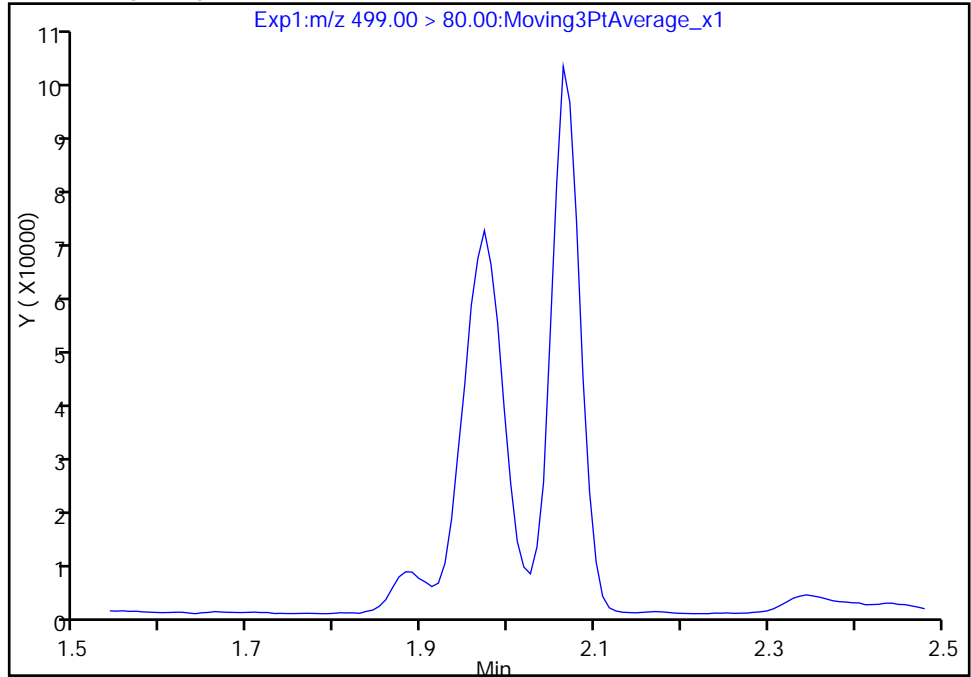
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Injection Date: 08-Dec-2017 14:00:40 Instrument ID: A8_N
Lims ID: 320-33890-A-5-A Lab Sample ID: 320-33890-5
Client ID: NAWC-120417-RW-028
Operator ID: SACINSTLCMS01 ALS Bottle#: 40 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

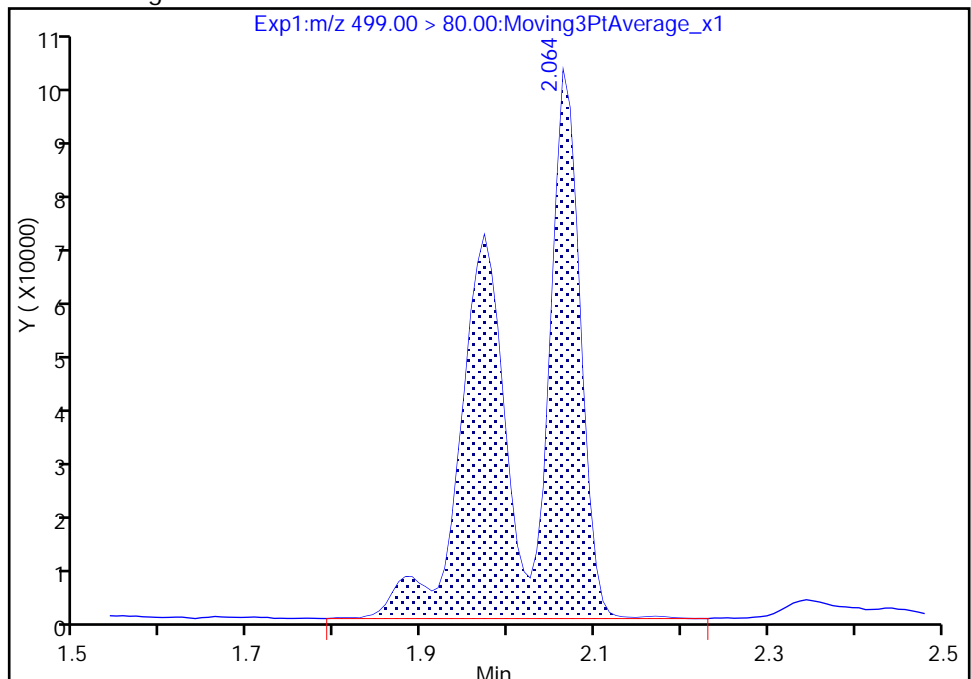
Not Detected
Expected RT: 2.06

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 475551
Amount: 4.700063
Amount Units: ng/ml



Reviewer: barnettj, 11-Dec-2017 09:56:27

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

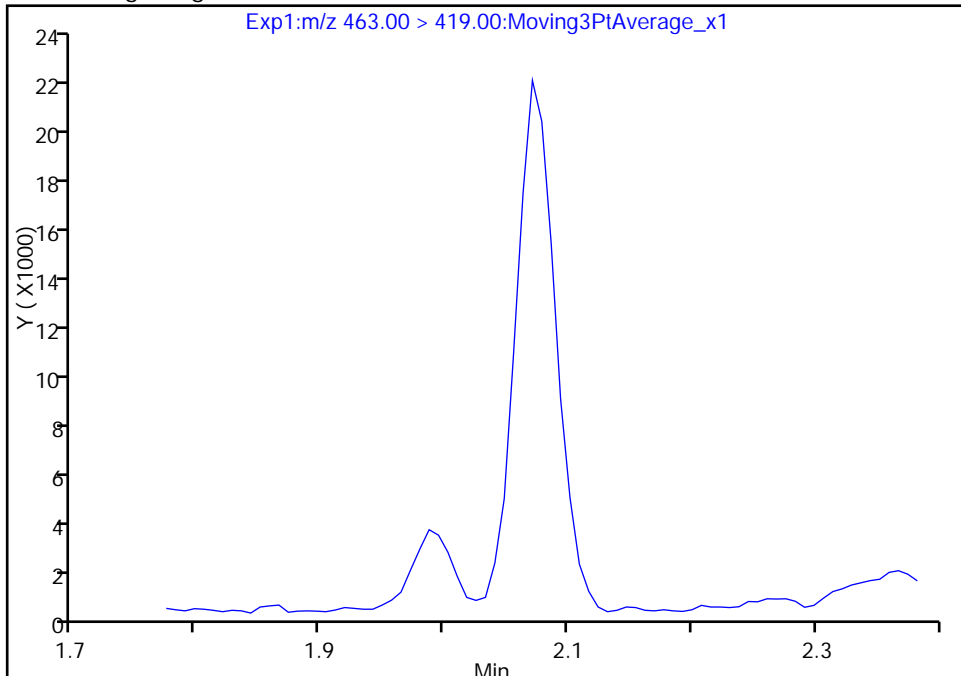
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Injection Date: 08-Dec-2017 14:00:40 Instrument ID: A8_N
Lims ID: 320-33890-A-5-A Lab Sample ID: 320-33890-5
Client ID: NAWC-120417-RW-028
Operator ID: SACINSTLCMS01 ALS Bottle#: 40 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

9 Perfluorononanoic acid, CAS: 375-95-1

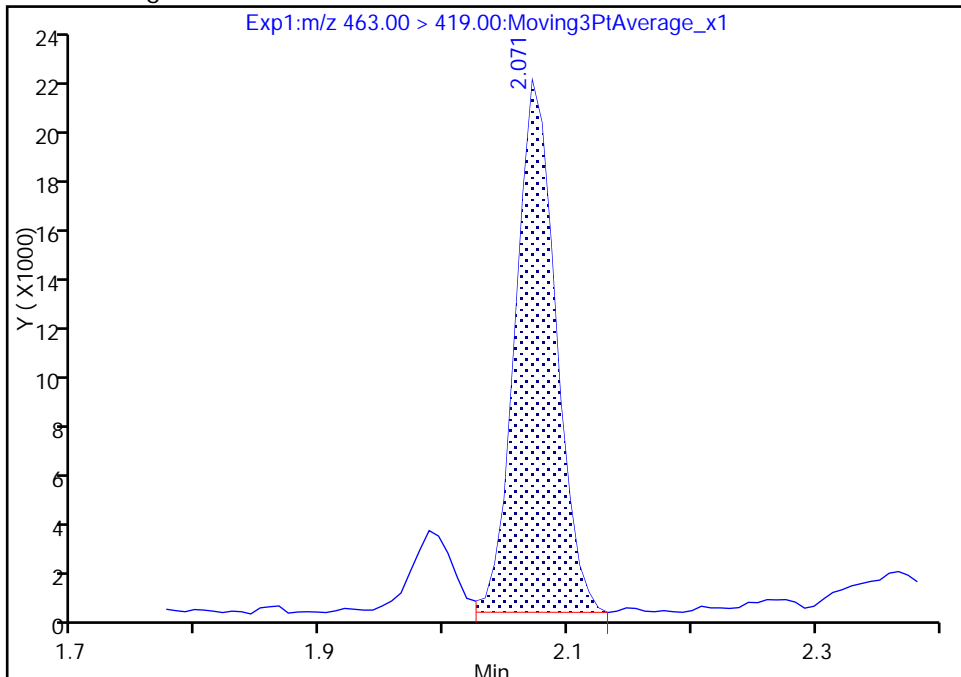
Signal: 1

Not Detected
Expected RT: 2.16

Processing Integration Results



Manual Integration Results



RT: 2.07
Area: 48624
Amount: 0.506386
Amount Units: ng/ml

Reviewer: barnettj, 11-Dec-2017 09:56:42
Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-028 Lab Sample ID: 320-33890-6
 Matrix: Water Lab File ID: 2017.12.08_537AA_020.d
 Analysis Method: 537 Date Collected: 12/04/2017 11:05
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 248.2 (mL) Date Analyzed: 12/08/2017 14:05
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 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)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	95		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_020.d
 Lims ID: 320-33890-A-6-A
 Client ID: NAWC-120417-FRB-028
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:05:21 ALS Bottle#: 41 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-6-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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

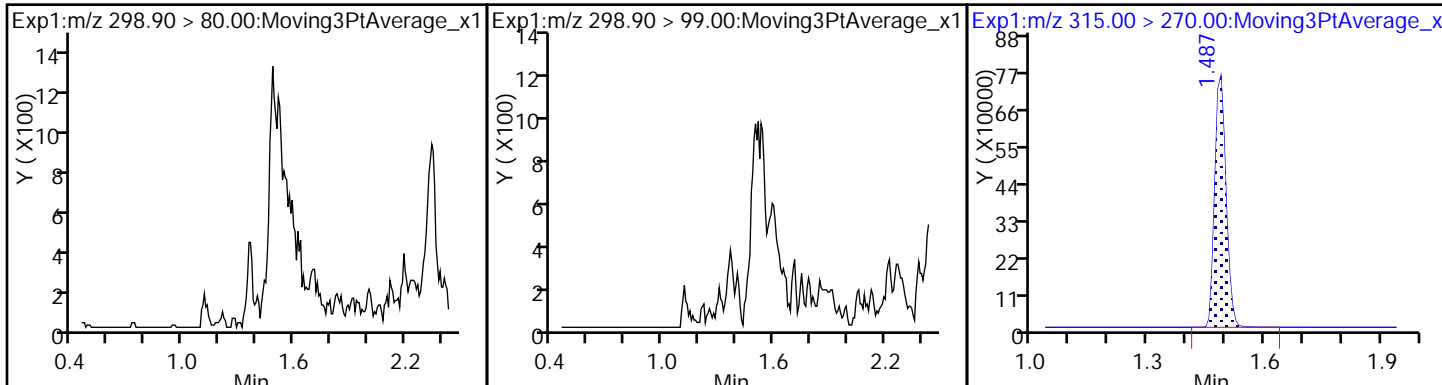
Column 1 : Det: EXP1
 Process Host: XAWRK015

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.487	1.573	-0.086	1.000	1496601	9.68	9401	
* 6 13C2-PFOA	415.00 > 370.00	1.813	1.913	-0.100		1405251	10.0	7972	
* 7 13C4 PFOS	503.00 > 80.00	2.071	2.151	-0.080		2995330	28.7	7872	
\$ 10 13C2 PFDA	515.00 > 470.00	2.253	2.312	-0.059	1.000	1020055	9.49	7404	

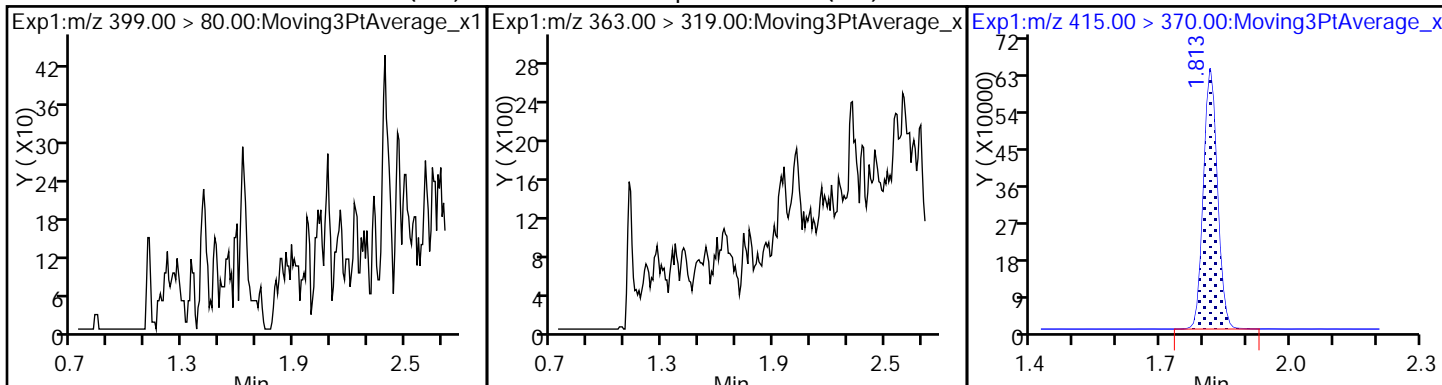
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_020.d
Injection Date: 08-Dec-2017 14:05:21 Instrument ID: A8_N
Lims ID: 320-33890-A-6-A Lab Sample ID: 320-33890-6
Client ID: NAWC-120417-FRB-028
Operator ID: SACINSTLCMS01 ALS Bottle#: 41 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

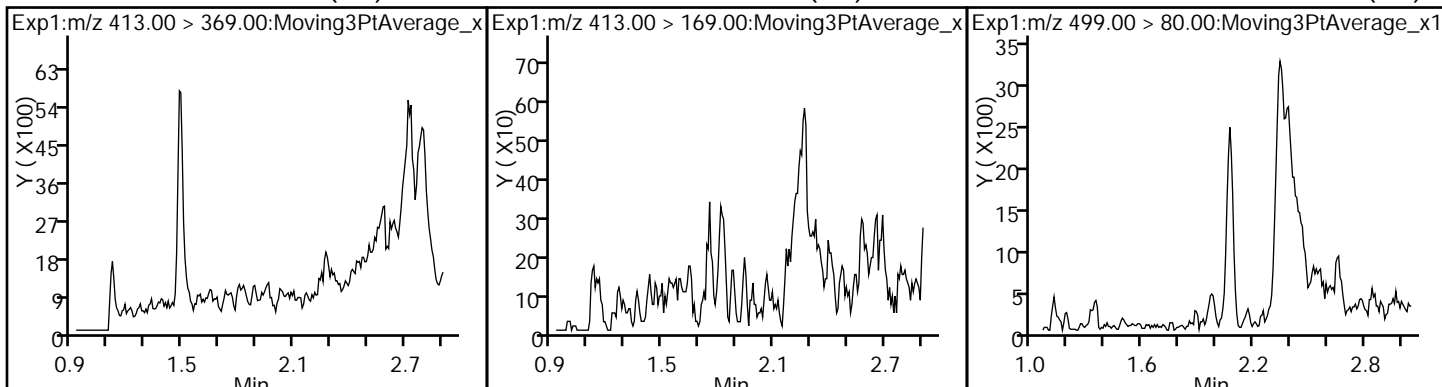
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



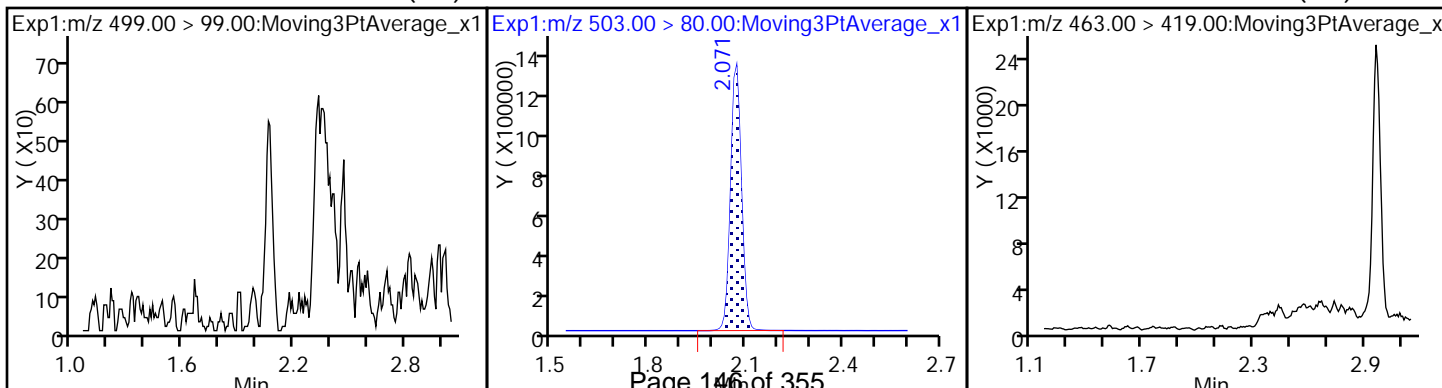
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



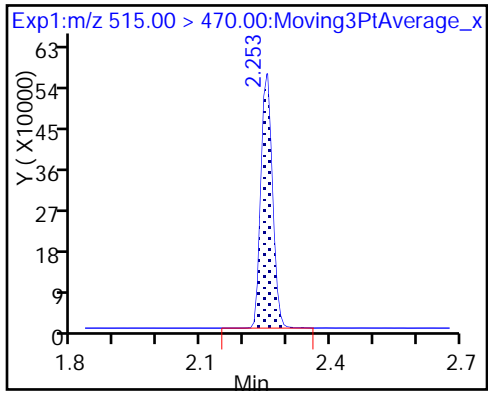
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) 8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS 9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_020.d
 Lims ID: 320-33890-A-6-A
 Client ID: NAWC-120417-FRB-028
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:05:21 ALS Bottle#: 41 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-6-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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: XAWRK015

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.68	96.79
\$ 10 13C2 PFDA	10.0	9.49	94.86

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-118 Lab Sample ID: 320-33890-7
 Matrix: Water Lab File ID: 2017.12.08_537AA_021.d
 Analysis Method: 537 Date Collected: 12/04/2017 11:40
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 248.1(mL) Date Analyzed: 12/08/2017 14:10
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	16	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)	10	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.0	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	97		70-130
STL00996	13C2 PFDA	95		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_021.d
 Lims ID: 320-33890-A-7-A
 Client ID: NAWC-120417-RW-118
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:10:02 ALS Bottle#: 42 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-7-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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: XAWRK015

First Level Reviewer: barnettj Date: 11-Dec-2017 09:58:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.366	1.444	-0.078	1.000	185924	1.57		122	
298.90 > 99.00	1.366	1.444	-0.078	1.000	129573		1.43(0.00-0.00)	280	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.573	-0.094	1.000	1494034	9.75		9298	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.725	-0.101	1.000	452818	2.55		430	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.725	-0.101	1.000	161416	1.24		44.3	
* 6 13C2-PFOA									
415.00 > 370.00	1.806	1.913	-0.107		1393232	10.0		8498	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.806	1.914	-0.108	1.000	520569	4.04		120	
413.00 > 169.00	1.806	1.914	-0.108	1.000	322814		1.61(0.00-0.00)	827	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.064	2.064	0.0	1.000	473582	4.76		158	
499.00 > 99.00	2.064	2.064	0.0	1.000	91220		5.19(0.00-0.00)	228	
* 7 13C4 PFOS									
503.00 > 80.00	2.064	2.151	-0.087		3037244	28.7		4941	
9 Perfluorononanoic acid									
463.00 > 419.00	2.071	2.158	-0.087	1.000	32456	0.3508		8.3	M
\$ 10 13C2 PFDA									
515.00 > 470.00	2.246	2.312	-0.066	1.000	1012220	9.49		9154	

QC Flag Legend

Review Flags

M - Manually Integrated

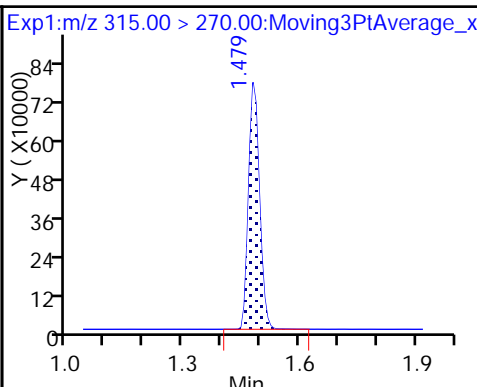
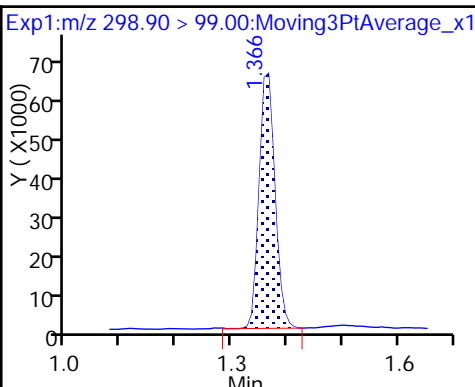
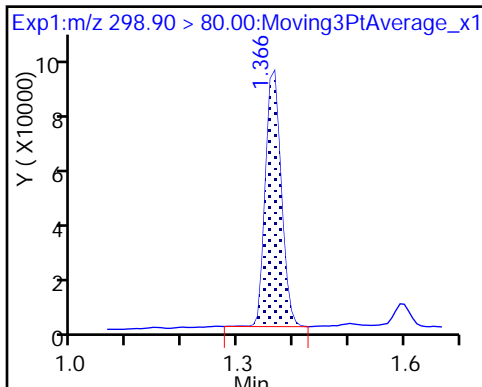
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_021.d
Injection Date: 08-Dec-2017 14:10:02 Instrument ID: A8_N
Lims ID: 320-33890-A-7-A Lab Sample ID: 320-33890-7
Client ID: NAWC-120417-RW-118
Operator ID: SACINSTLCMS01 ALS Bottle#: 42 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

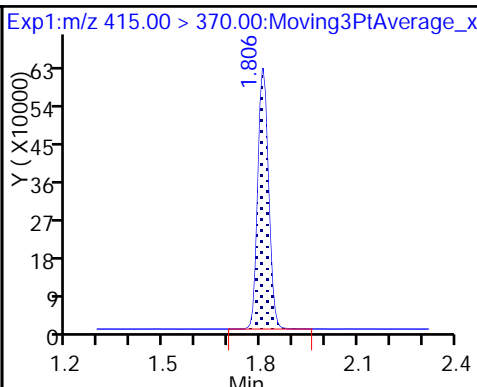
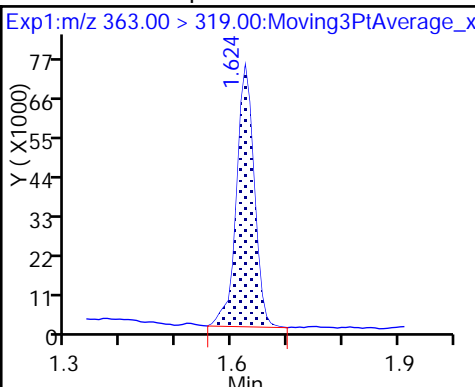
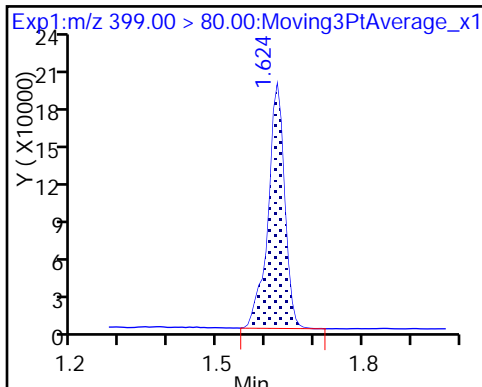
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

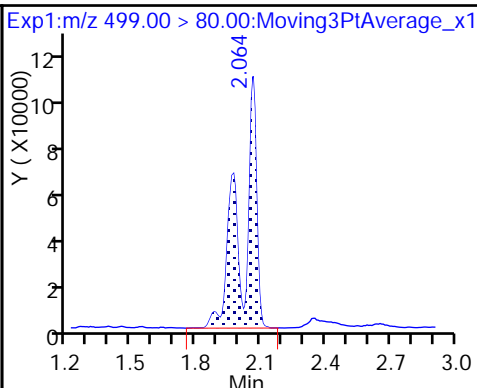
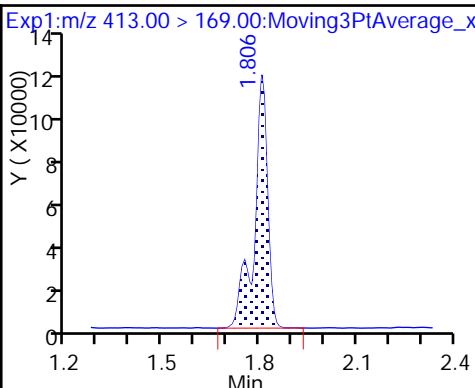
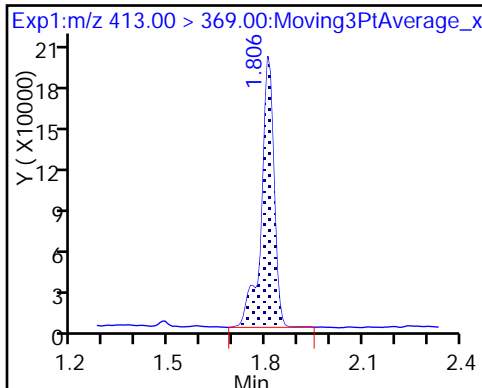
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

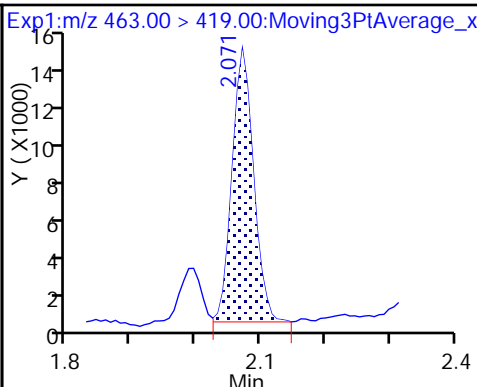
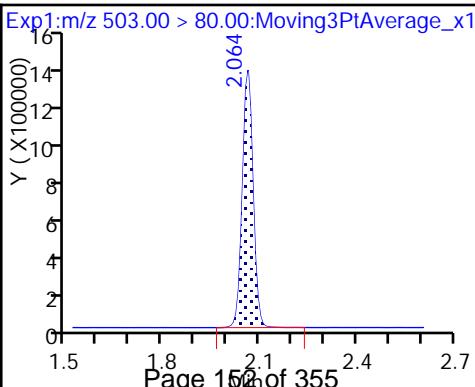
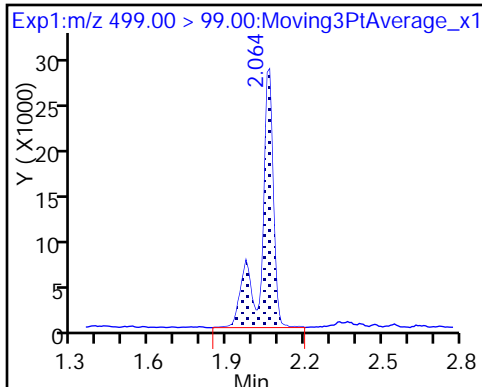
8 Perfluorooctane sulfonic acid



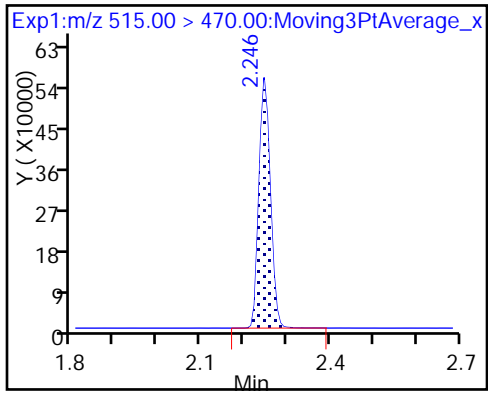
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_021.d
 Lims ID: 320-33890-A-7-A
 Client ID: NAWC-120417-RW-118
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:10:02 ALS Bottle#: 42 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-7-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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: XAWRK015

First Level Reviewer: barnettj Date: 11-Dec-2017 09:58:34

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.75	97.46
\$ 10 13C2 PFDA	10.0	9.49	94.95

TestAmerica Sacramento

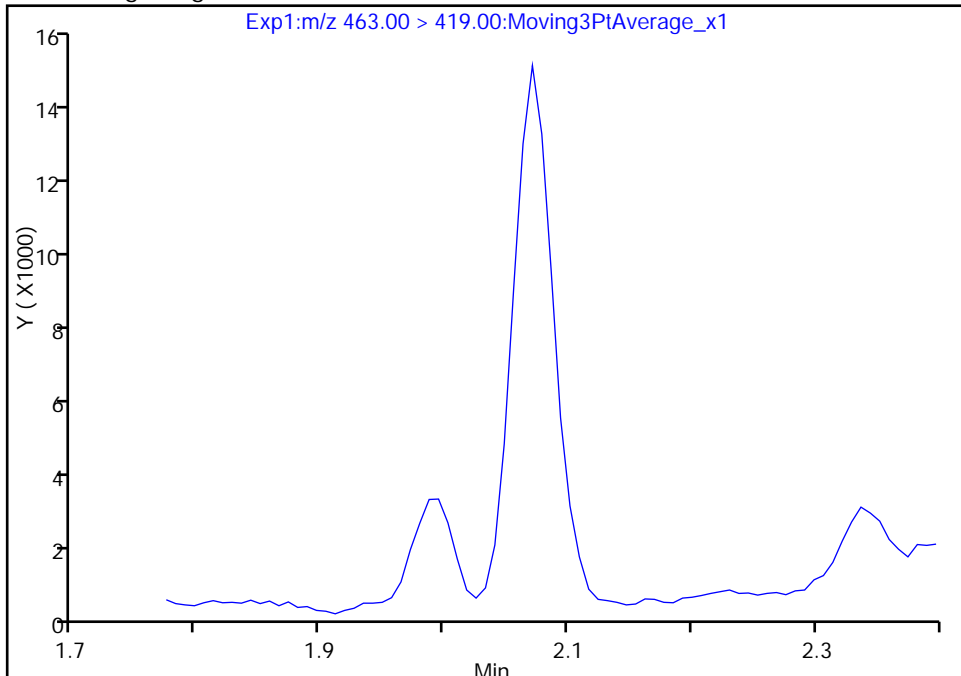
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_021.d
Injection Date: 08-Dec-2017 14:10:02 Instrument ID: A8_N
Lims ID: 320-33890-A-7-A Lab Sample ID: 320-33890-7
Client ID: NAWC-120417-RW-118
Operator ID: SACINSTLCMS01 ALS Bottle#: 42 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

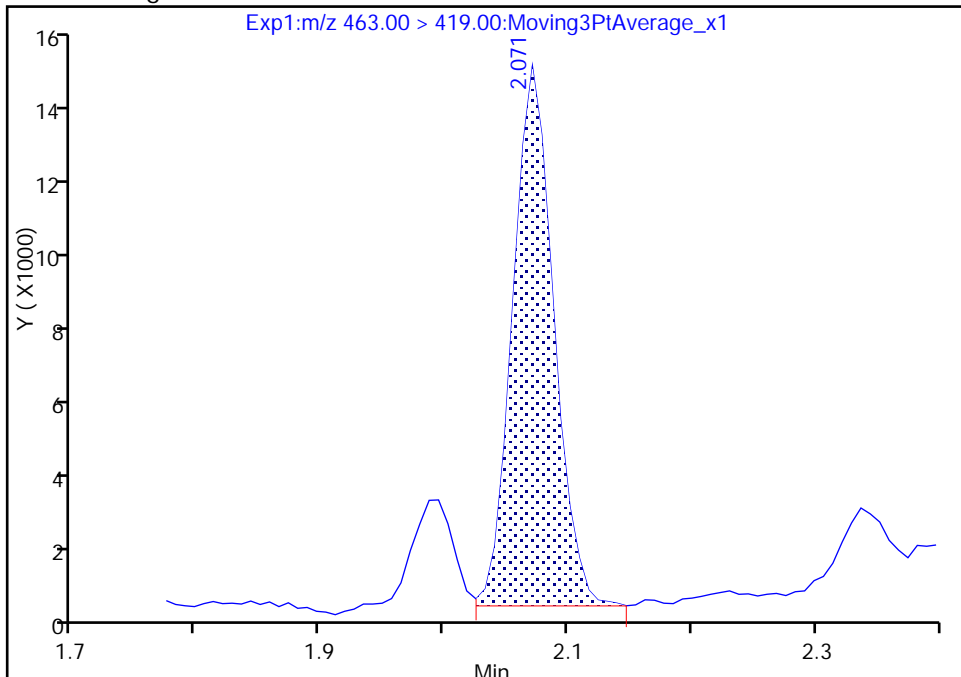
Not Detected
Expected RT: 2.16

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 32456
Amount: 0.350751
Amount Units: ng/ml



Reviewer: barnettj, 11-Dec-2017 09:58:18
Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-118 Lab Sample ID: 320-33890-8
 Matrix: Water Lab File ID: 2017.12.08_537AA_022.d
 Analysis Method: 537 Date Collected: 12/04/2017 11:35
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 246(mL) Date Analyzed: 12/08/2017 14:14
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	94		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_022.d
 Lims ID: 320-33890-A-8-A
 Client ID: NAWC-120417-FRB-118
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:14:42 ALS Bottle#: 43 Worklist Smp#: 12
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-8-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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

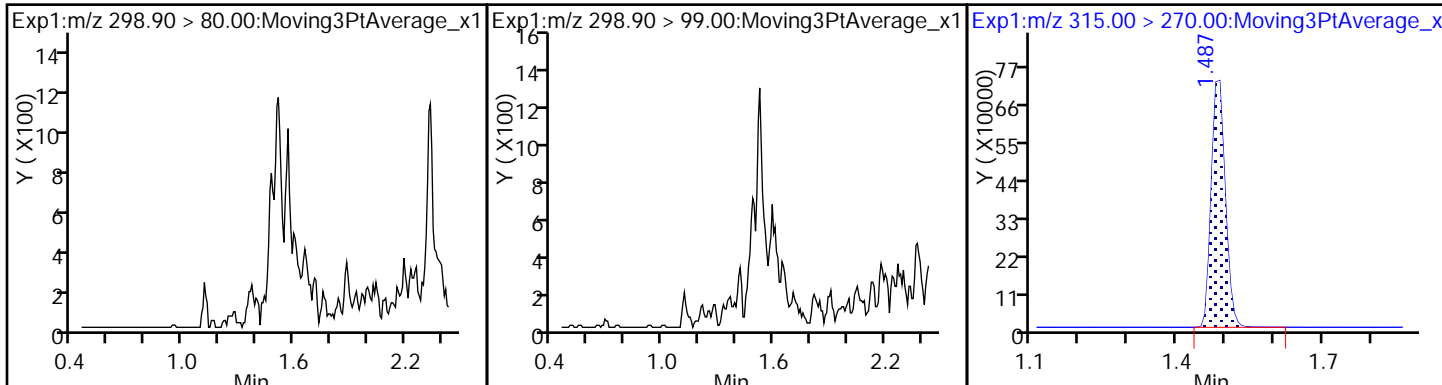
Column 1 : Det: EXP1
 Process Host: XAWRK015

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.487	1.573	-0.086	1.000	1434201	9.32	9357	
* 6 13C2-PFOA	415.00 > 370.00	1.813	1.913	-0.100		1399280	10.0	8113	
* 7 13C4 PFOS	503.00 > 80.00	2.064	2.151	-0.087		2932875	28.7	7610	
\$ 10 13C2 PFDA	515.00 > 470.00	2.246	2.312	-0.066	1.000	1011132	9.44	8806	

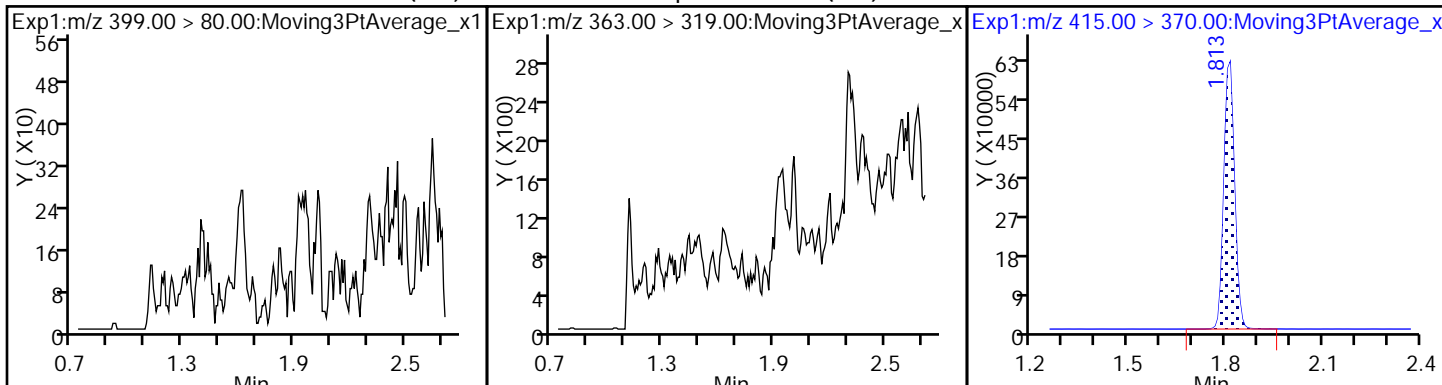
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_022.d
Injection Date: 08-Dec-2017 14:14:42 Instrument ID: A8_N
Lims ID: 320-33890-A-8-A Lab Sample ID: 320-33890-8
Client ID: NAWC-120417-FRB-118
Operator ID: SACINSTLCMS01 ALS Bottle#: 43 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

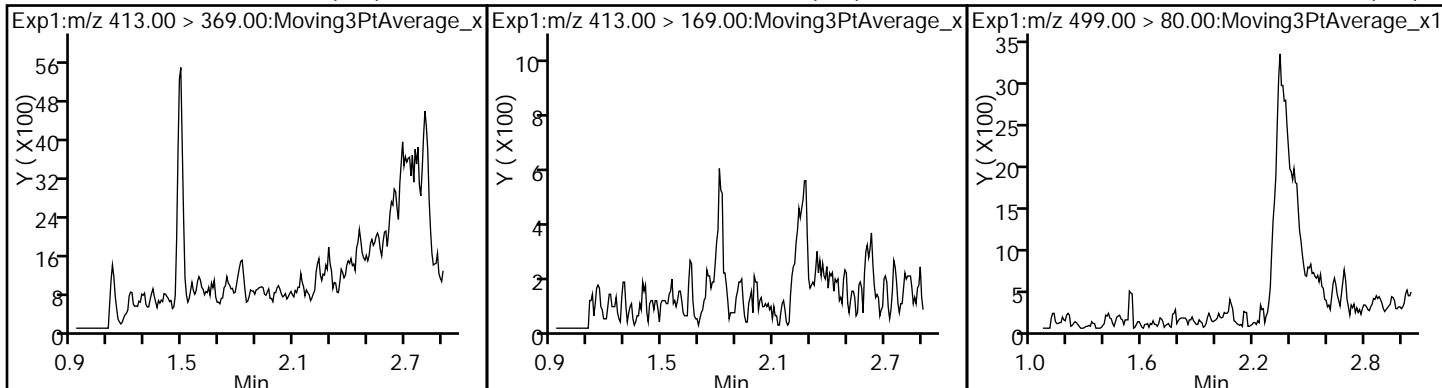
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



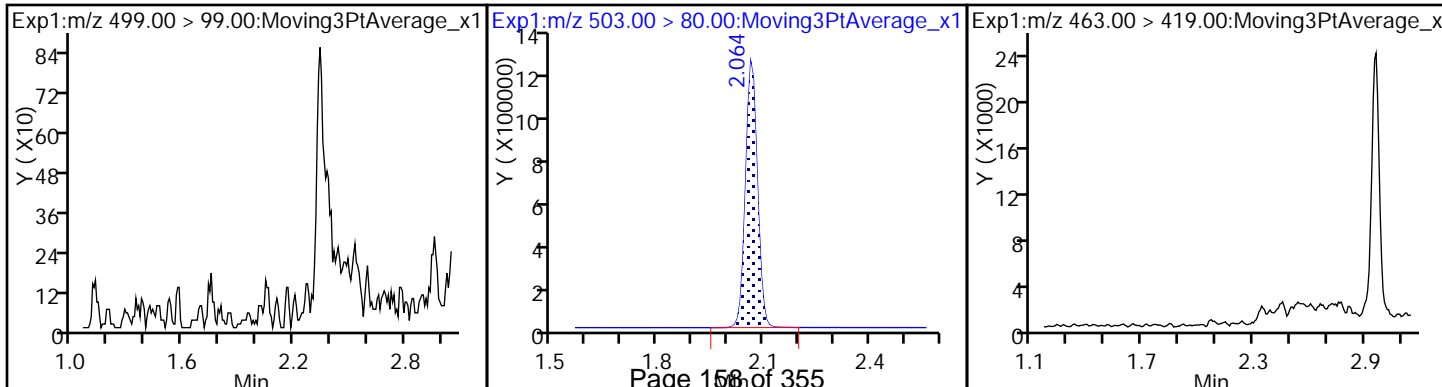
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



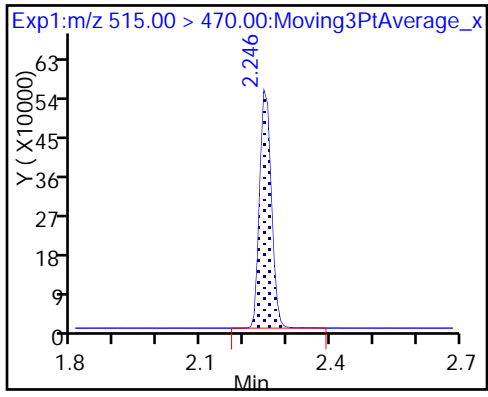
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) 8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS 9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_022.d
 Lims ID: 320-33890-A-8-A
 Client ID: NAWC-120417-FRB-118
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:14:42 ALS Bottle#: 43 Worklist Smp#: 12
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-8-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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: XAWRK015

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.32	93.15
\$ 10 13C2 PFDA	10.0	9.44	94.43

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-071 Lab Sample ID: 320-33890-9
 Matrix: Water Lab File ID: 2017.12.08_537AA_023.d
 Analysis Method: 537 Date Collected: 12/04/2017 12:10
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 251.8 (mL) Date Analyzed: 12/08/2017 14:19
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 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)	6.9	J	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 M	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.9	J M	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	95		70-130
STL00996	13C2 PFDA	96		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_023.d
 Lims ID: 320-33890-A-9-A
 Client ID: NAWC-120417-RW-071
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:19:23 ALS Bottle#: 44 Worklist Smp#: 13
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-9-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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: XAWRK015

First Level Reviewer: barnettj Date: 11-Dec-2017 09:59:42

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.358	1.444	-0.086	1.000	137882	1.33		252	
298.90 > 99.00	1.358	1.444	-0.086	1.000	98807		1.40(0.00-0.00)	218	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.573	-0.094	1.000	1325209	9.46		7671	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.725	-0.101	1.000	57414	0.3687		56.3	M
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.725	-0.101	1.000	86014	0.7214		24.1	M
* 6 13C2-PFOA									
415.00 > 370.00	1.806	1.913	-0.107		1272649	10.0		7067	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.806	1.914	-0.108	1.000	204272	1.73		52.8	
413.00 > 169.00	1.806	1.914	-0.108	1.000	122158		1.67(0.00-0.00)	286	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.064	2.064	0.0	1.000	80635	0.9233		28.2	
499.00 > 99.00	2.064	2.064	0.0	1.000	11717		6.88(0.00-0.00)	24.7	
* 7 13C4 PFOS									
503.00 > 80.00	2.064	2.151	-0.087		2667570	28.7		3966	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.246	2.312	-0.066	1.000	937091	9.62		7897	

QC Flag Legend

Review Flags

M - Manually Integrated

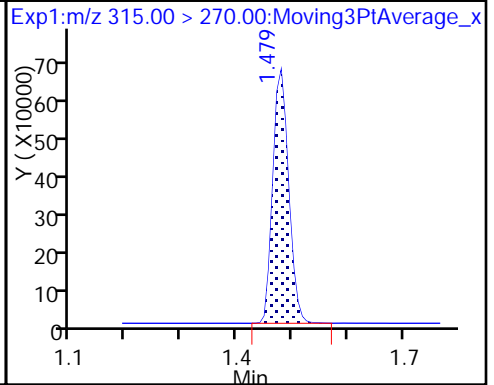
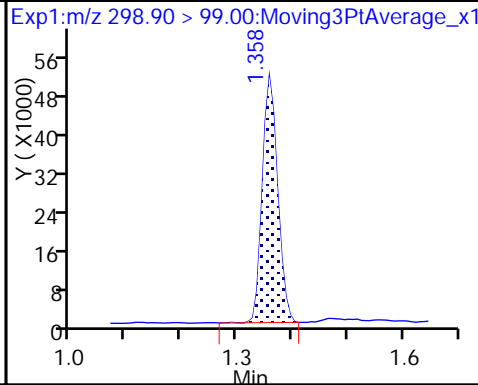
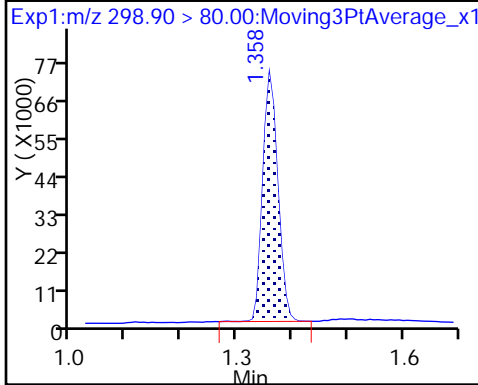
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_023.d
Injection Date: 08-Dec-2017 14:19:23 Instrument ID: A8_N
Lims ID: 320-33890-A-9-A Lab Sample ID: 320-33890-9
Client ID: NAWC-120417-RW-071
Operator ID: SACINSTLCMS01 ALS Bottle#: 44 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

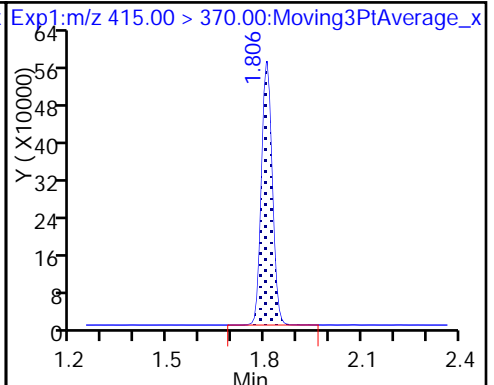
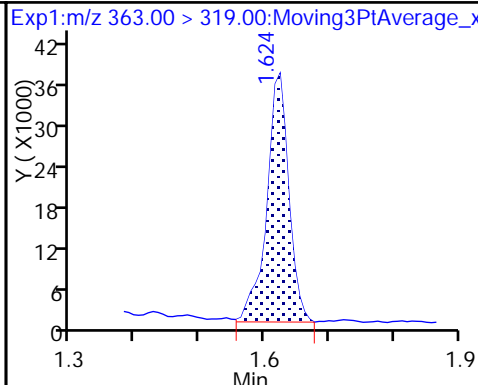
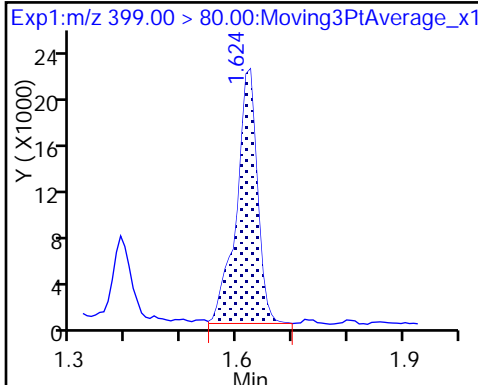
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (M)

4 Perfluoroheptanoic acid (M)

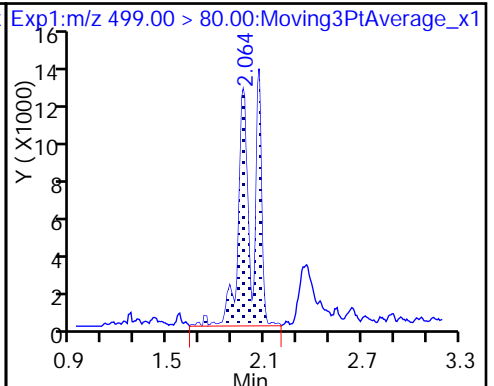
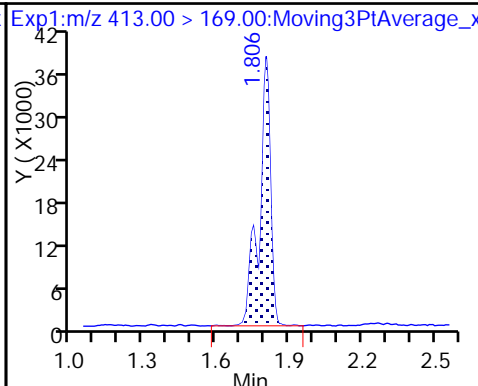
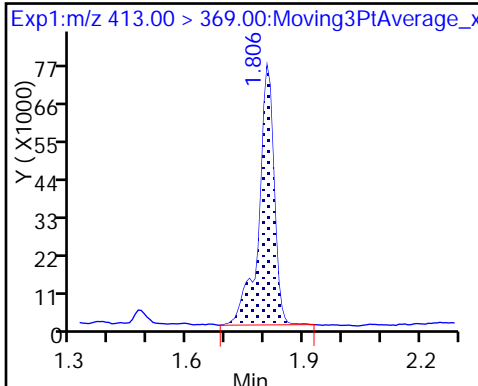
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

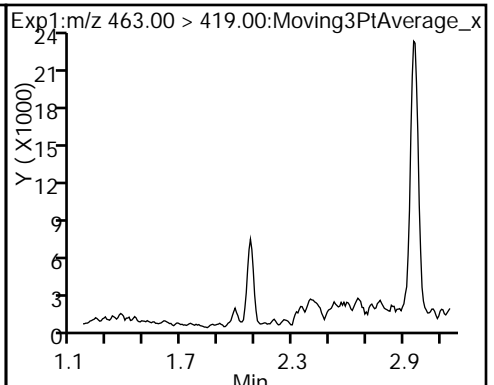
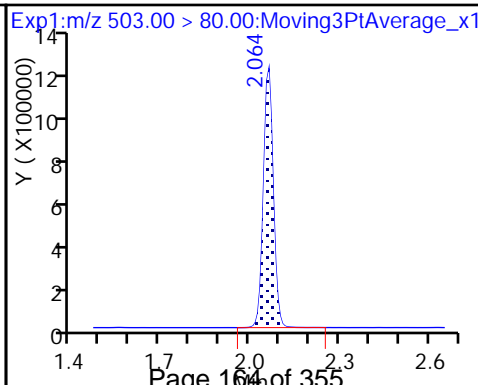
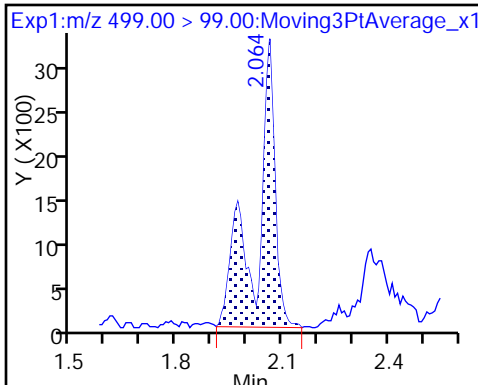
8 Perfluorooctane sulfonic acid



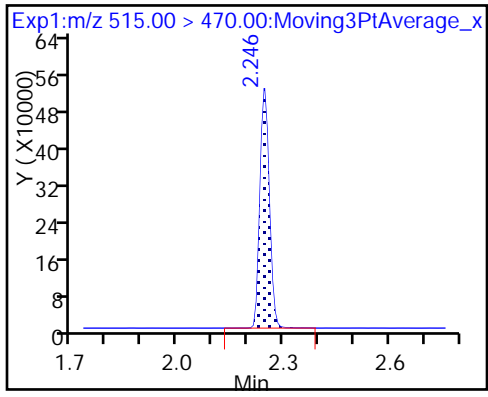
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_023.d
 Lims ID: 320-33890-A-9-A
 Client ID: NAWC-120417-RW-071
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:19:23 ALS Bottle#: 44 Worklist Smp#: 13
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-9-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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: XAWRK015

First Level Reviewer: barnettj Date: 11-Dec-2017 09:59:42

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.46	94.64
\$ 10 13C2 PFDA	10.0	9.62	96.23

TestAmerica Sacramento

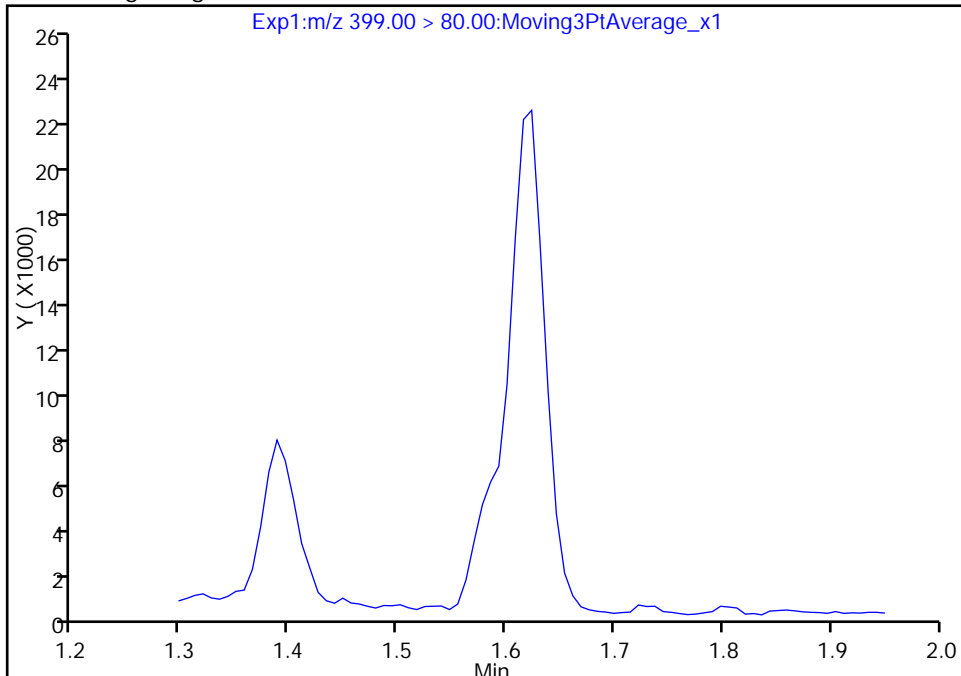
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Injection Date: 08-Dec-2017 14:19:23 Instrument ID: A8_N
Lims ID: 320-33890-A-9-A Lab Sample ID: 320-33890-9
Client ID: NAWC-120417-RW-071
Operator ID: SACINSTLCMS01 ALS Bottle#: 44 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

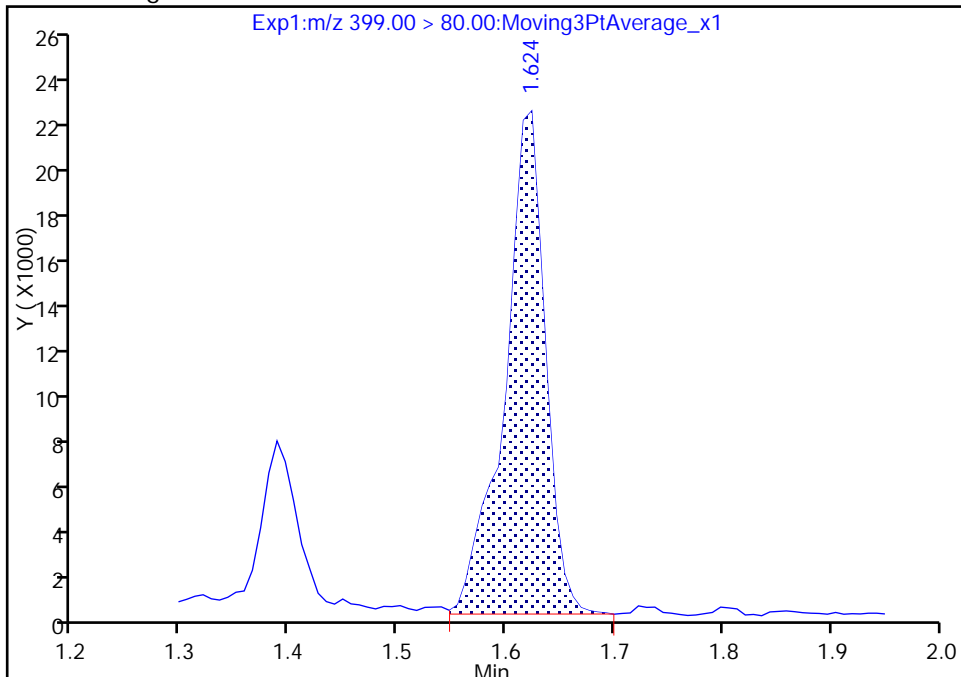
Not Detected
Expected RT: 1.72

Processing Integration Results



Manual Integration Results

RT: 1.62
Area: 57414
Amount: 0.368719
Amount Units: ng/ml



Reviewer: barnettj, 11-Dec-2017 09:59:19
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

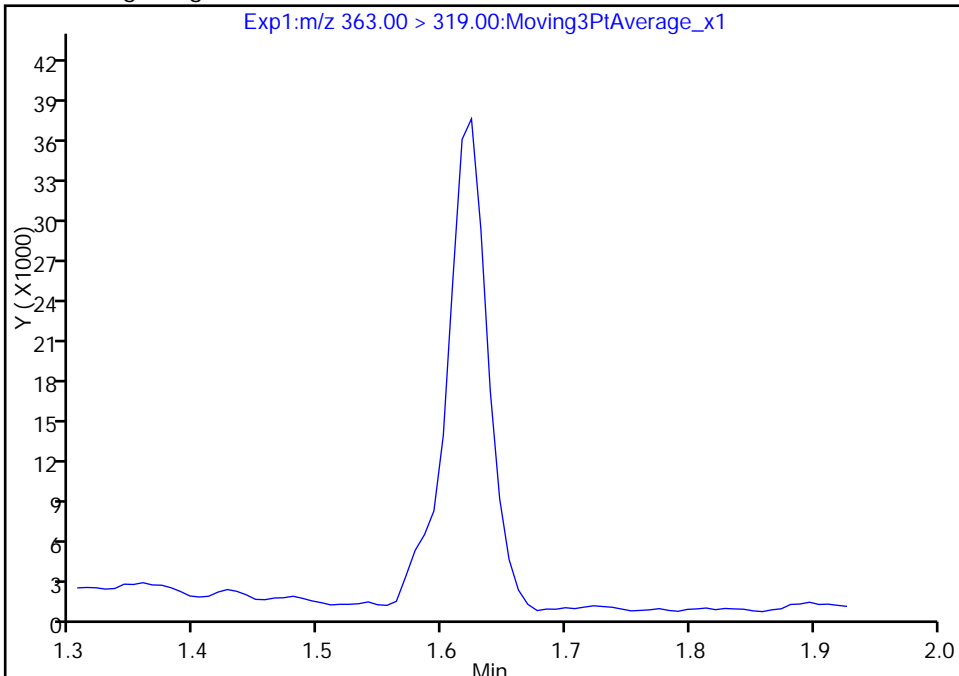
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Injection Date: 08-Dec-2017 14:19:23 Instrument ID: A8_N
Lims ID: 320-33890-A-9-A Lab Sample ID: 320-33890-9
Client ID: NAWC-120417-RW-071
Operator ID: SACINSTLCMS01 ALS Bottle#: 44 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

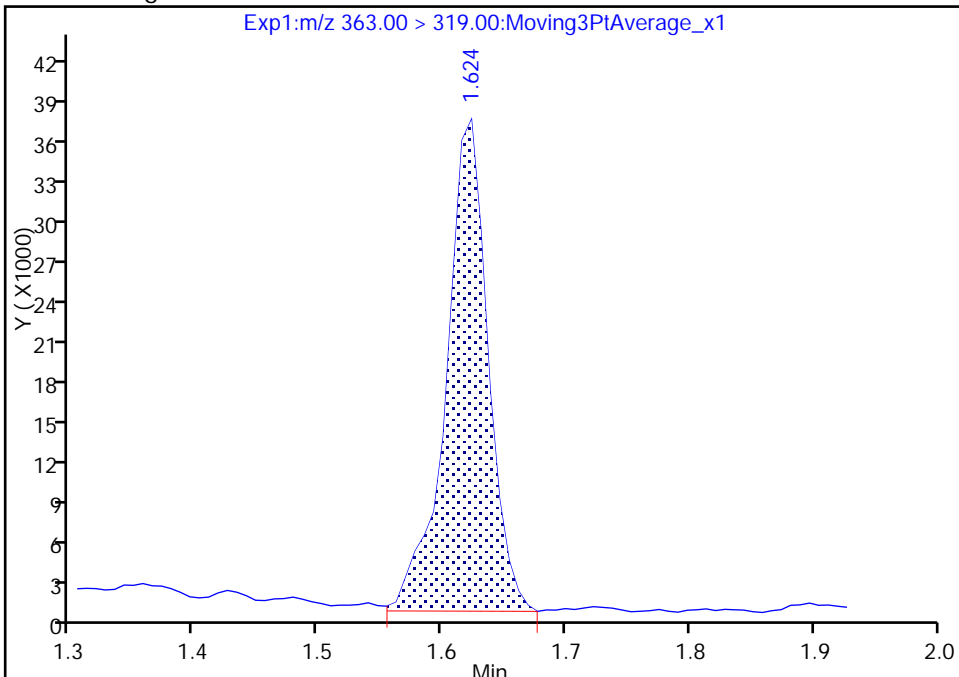
Not Detected
Expected RT: 1.72

Processing Integration Results



Manual Integration Results

RT: 1.62
Area: 86014
Amount: 0.721374
Amount Units: ng/ml



Reviewer: barnettj, 11-Dec-2017 09:59:32
Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-071 Lab Sample ID: 320-33890-10
 Matrix: Water Lab File ID: 2017.12.08_537AA_024.d
 Analysis Method: 537 Date Collected: 12/04/2017 12:05
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 245.4 (mL) Date Analyzed: 12/08/2017 14:24
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.9
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	92		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_024.d
 Lims ID: 320-33890-A-10-A
 Client ID: NAWC-120417-FRB-071
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:24:03 ALS Bottle#: 45 Worklist Smp#: 14
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-10-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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

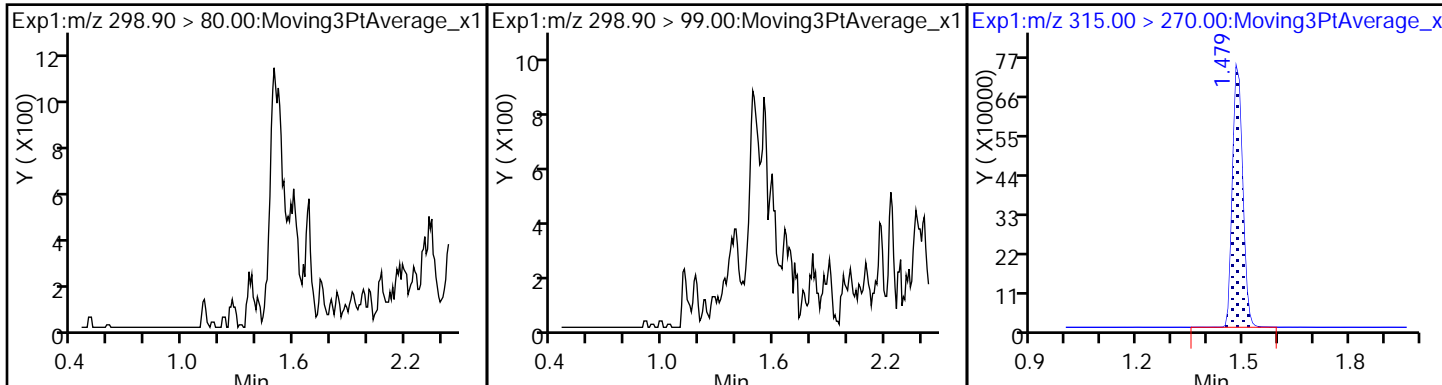
Column 1 : Det: EXP1
 Process Host: XAWRK015

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.479	1.573	-0.094	1.000	1446138	9.46	10330	
* 6 13C2-PFOA	415.00 > 370.00	1.806	1.913	-0.107		1389736	10.0	7703	
* 7 13C4 PFOS	503.00 > 80.00	2.064	2.151	-0.087		2950821	28.7	9055	
\$ 10 13C2 PFDA	515.00 > 470.00	2.246	2.312	-0.066	1.000	981503	9.23	7019	

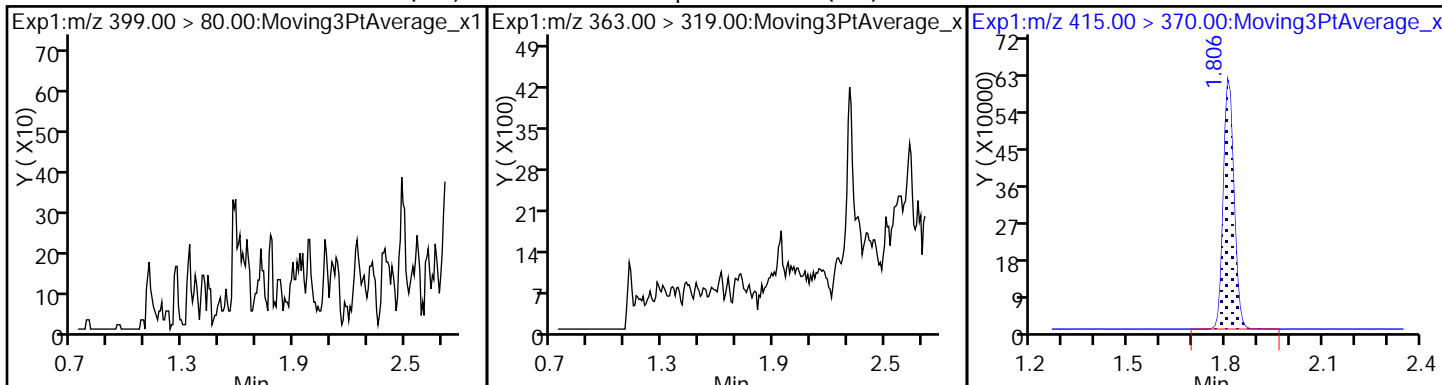
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_024.d
Injection Date: 08-Dec-2017 14:24:03 Instrument ID: A8_N
Lims ID: 320-33890-A-10-A Lab Sample ID: 320-33890-10
Client ID: NAWC-120417-FRB-071
Operator ID: SACINSTLCMS01 ALS Bottle#: 45 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

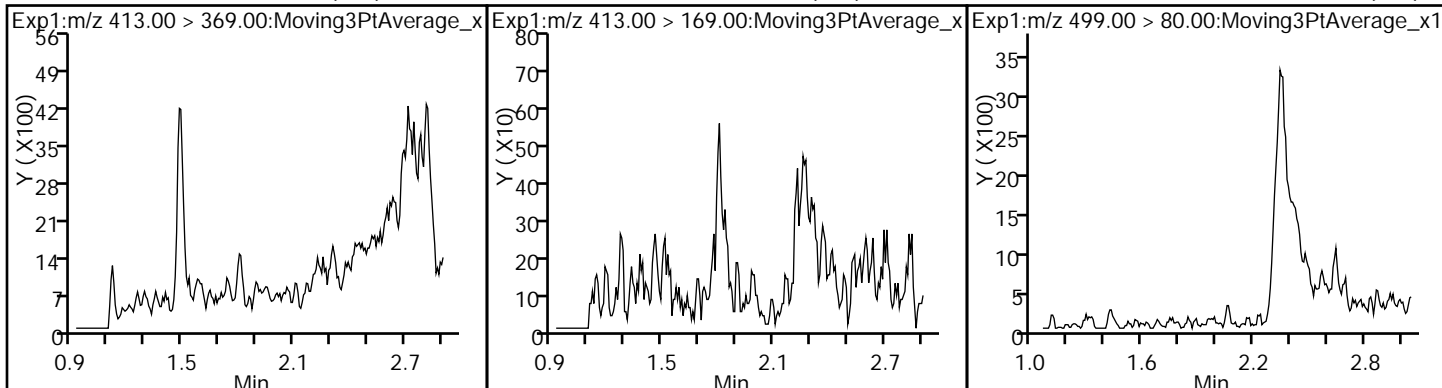
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



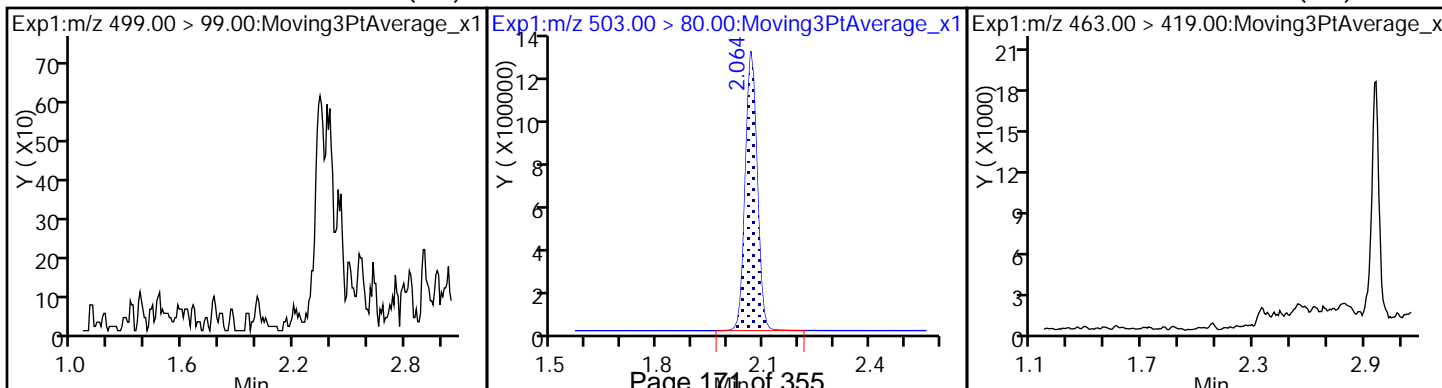
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



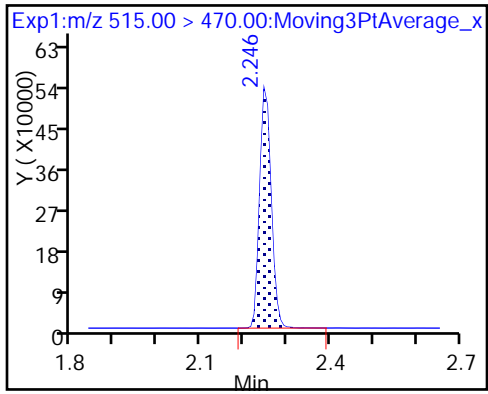
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) 8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS 9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_024.d
 Lims ID: 320-33890-A-10-A
 Client ID: NAWC-120417-FRB-071
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:24:03 ALS Bottle#: 45 Worklist Smp#: 14
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-10-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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: XAWRK015

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.46	94.57
\$ 10 13C2 PFDA	10.0	9.23	92.30

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-075 Lab Sample ID: 320-33890-11
 Matrix: Water Lab File ID: 2017.12.08_537AA_025.d
 Analysis Method: 537 Date Collected: 12/04/2017 12:40
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 247.2 (mL) Date Analyzed: 12/08/2017 14:28
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	92		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_025.d
 Lims ID: 320-33890-A-11-A
 Client ID: NAWC-120417-RW-075
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:28:43 ALS Bottle#: 46 Worklist Smp#: 15
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-11-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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

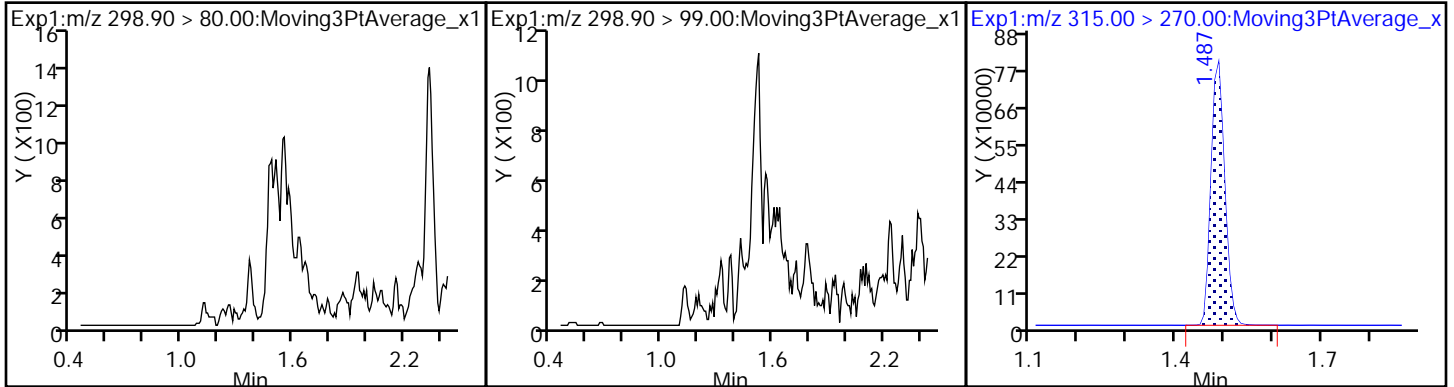
Column 1 : Det: EXP1
 Process Host: XAWRK015

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.487	1.573	-0.086	1.000	1533332	9.80	9493	
* 6 13C2-PFOA	415.00 > 370.00	1.813	1.913	-0.100		1421524	10.0	7516	
* 7 13C4 PFOS	503.00 > 80.00	2.064	2.151	-0.087		2926970	28.7	6543	
\$ 10 13C2 PFDA	515.00 > 470.00	2.246	2.312	-0.066	1.000	995908	9.16	7902	

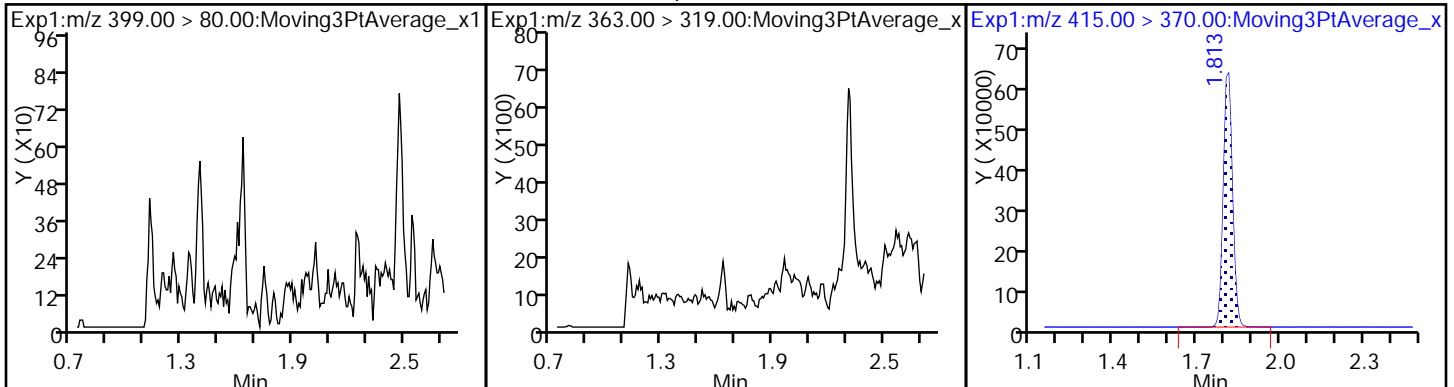
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_025.d
Injection Date: 08-Dec-2017 14:28:43 Instrument ID: A8_N
Lims ID: 320-33890-A-11-A Lab Sample ID: 320-33890-11
Client ID: NAWC-120417-RW-075
Operator ID: SACINSTLCMS01 ALS Bottle#: 46 Worklist Smp#: 15
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

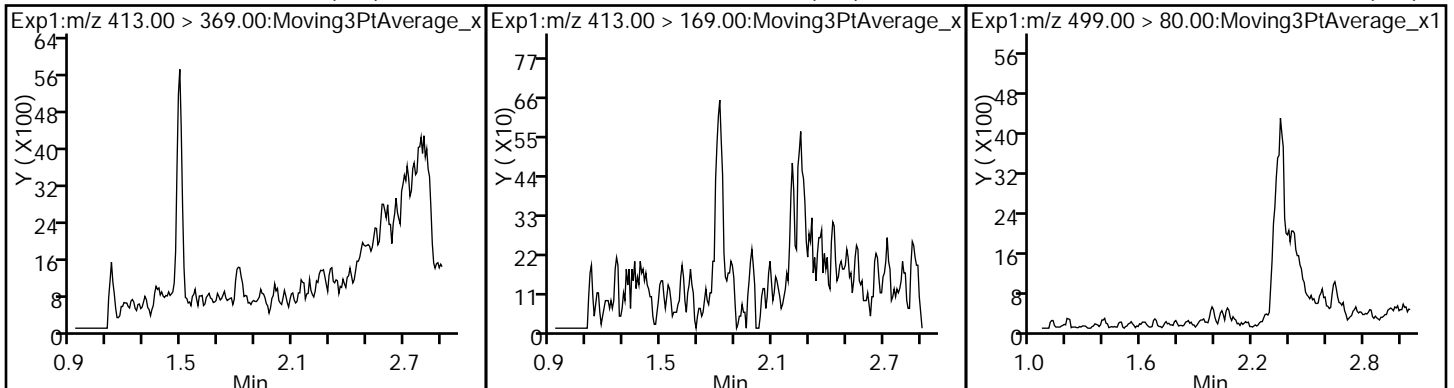
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



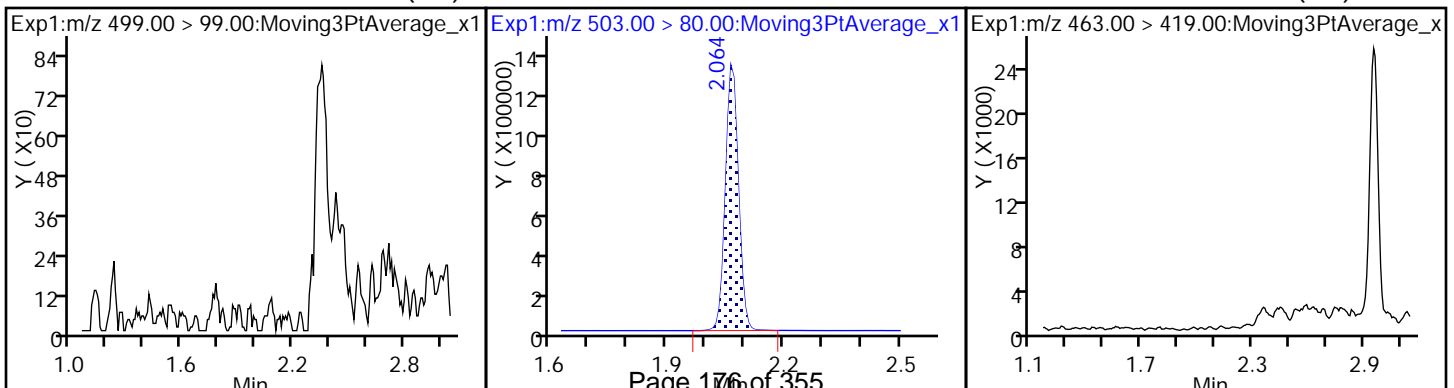
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



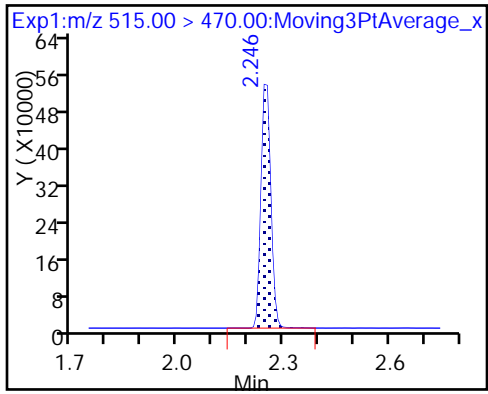
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) 8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS 9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_025.d
 Lims ID: 320-33890-A-11-A
 Client ID: NAWC-120417-RW-075
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:28:43 ALS Bottle#: 46 Worklist Smp#: 15
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-11-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:25:12 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: XAWRK015

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.80	98.03
\$ 10 13C2 PFDA	10.0	9.16	91.56

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-075 Lab Sample ID: 320-33890-12
 Matrix: Water Lab File ID: 2017.12.08_537AA_028.d
 Analysis Method: 537 Date Collected: 12/04/2017 12:35
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 248.6(mL) Date Analyzed: 12/08/2017 14:42
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199066 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	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	91		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_028.d
 Lims ID: 320-33890-A-12-A
 Client ID: NAWC-120417-FRB-075
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:42:45 ALS Bottle#: 47 Worklist Smp#: 18
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-12-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:36:43 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: XAWRK015

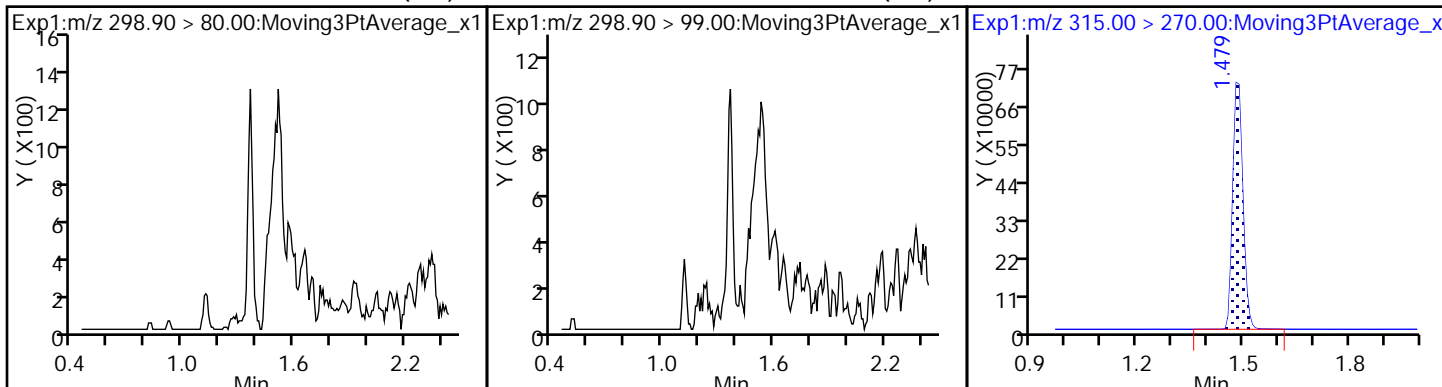
First Level Reviewer: barnettj Date: 11-Dec-2017 10:25:12

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.479	1.573	-0.094	1.000	1414709	10.2	8463	
* 6 13C2-PFOA	415.00 > 370.00	1.806	1.913	-0.107		1255016	10.0	6755	
* 7 13C4 PFOS	503.00 > 80.00	2.064	2.151	-0.087		2594570	28.7	8090	
\$ 10 13C2 PFDA	515.00 > 470.00	2.246	2.312	-0.066	1.000	869153	9.05	6996	

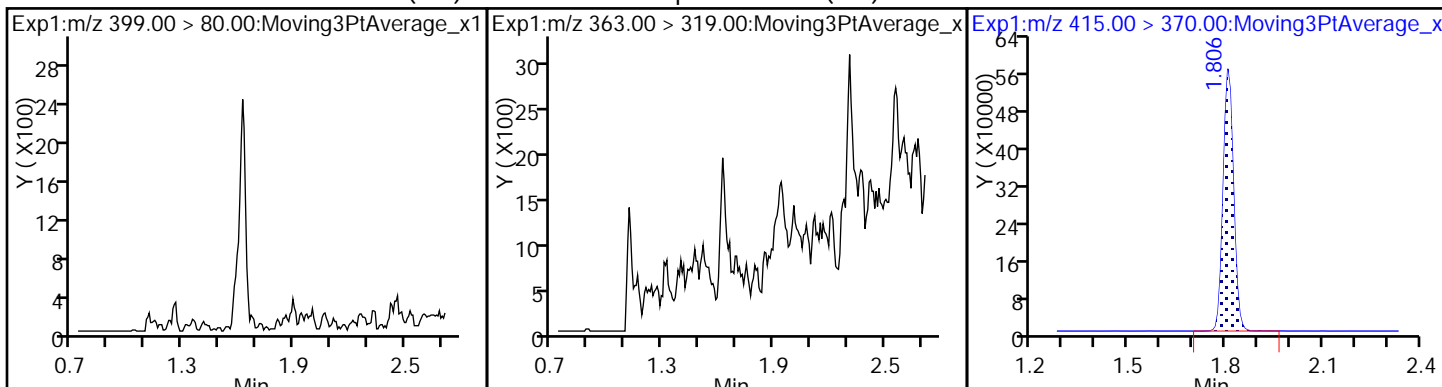
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_028.d
Injection Date: 08-Dec-2017 14:42:45 Instrument ID: A8_N
Lims ID: 320-33890-A-12-A Lab Sample ID: 320-33890-12
Client ID: NAWC-120417-FRB-075
Operator ID: SACINSTLCMS01 ALS Bottle#: 47 Worklist Smp#: 18
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

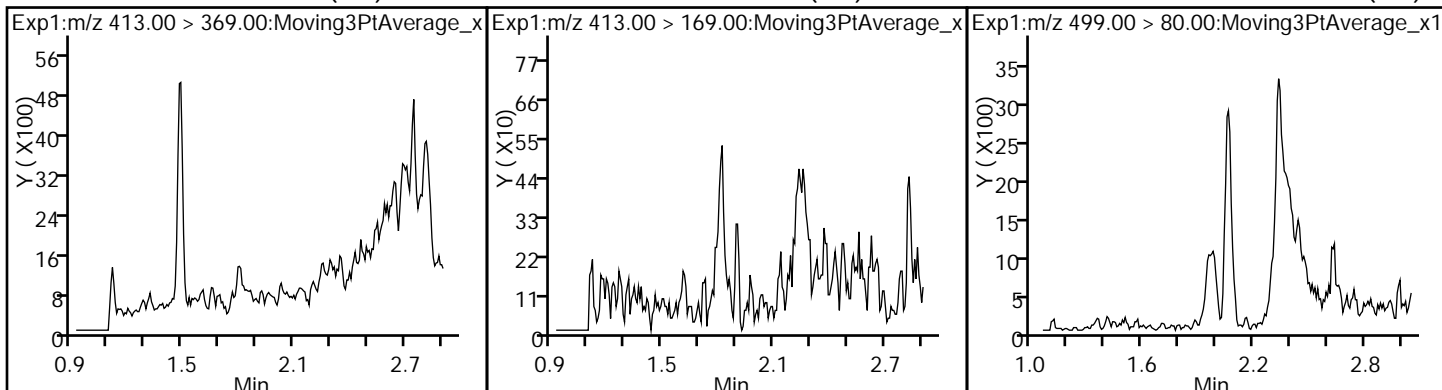
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



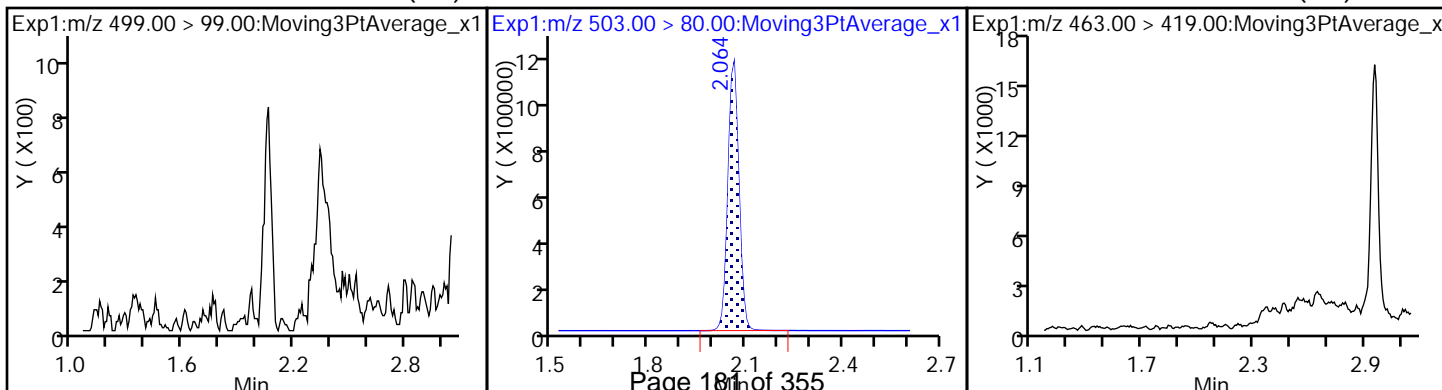
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



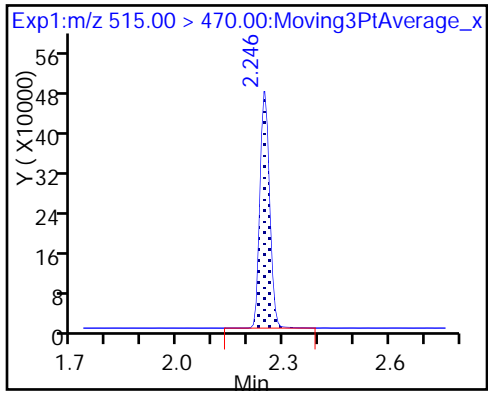
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) 8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS 9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_028.d
 Lims ID: 320-33890-A-12-A
 Client ID: NAWC-120417-FRB-075
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:42:45 ALS Bottle#: 47 Worklist Smp#: 18
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-12-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:36:43 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: XAWRK015

First Level Reviewer: barnettj Date: 11-Dec-2017 10:25:12

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.2	102.45
\$ 10 13C2 PFDA	10.0	9.05	90.50

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: WGNA-120417-DUP13 Lab Sample ID: 320-33890-13
 Matrix: Water Lab File ID: 2017.12.08_537AA_029.d
 Analysis Method: 537 Date Collected: 12/04/2017 07:00
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 251.2 (mL) Date Analyzed: 12/08/2017 14:47
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199066 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	3.8	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 M	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.1	J M	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U M	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	86		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_029.d
 Lims ID: 320-33890-A-13-A
 Client ID: WGNA-120417-DUP13
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:47:25 ALS Bottle#: 48 Worklist Smp#: 19
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-13-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:36:43 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: XAWRK015

First Level Reviewer: barnettj Date: 11-Dec-2017 10:01:54

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	1.358	1.444	-0.086	1.000	51641	0.4458		71.9	M
298.90 > 99.00	1.358	1.444	-0.086	1.000	37025		1.39(0.00-0.00)	84.7	M
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.573	-0.094	1.000	1511233	9.62		8469	
3 Perfluorohexanesulfonic acid									M
399.00 > 80.00	1.616	1.725	-0.109	1.000	43398	0.2503		64.1	M
4 Perfluoroheptanoic acid									M
363.00 > 319.00	1.616	1.725	-0.109	1.000	69290	0.5181		20.4	M
* 6 13C2-PFOA									
415.00 > 370.00	1.798	1.913	-0.115		1427376	10.0		7915	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.806	1.914	-0.108	1.000	126354	0.9562		34.8	
413.00 > 169.00	1.798	1.914	-0.116	0.996	73296		1.72(0.00-0.00)	183	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.056	2.064	-0.008	1.000	64042	0.6586		30.6	
499.00 > 99.00	2.056	2.064	-0.008	1.000	11036		5.80(0.00-0.00)	24.9	M
* 7 13C4 PFOS									
503.00 > 80.00	2.056	2.151	-0.095		2970166	28.7		6498	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.238	2.312	-0.074	1.000	934098	8.55		6987	

QC Flag Legend

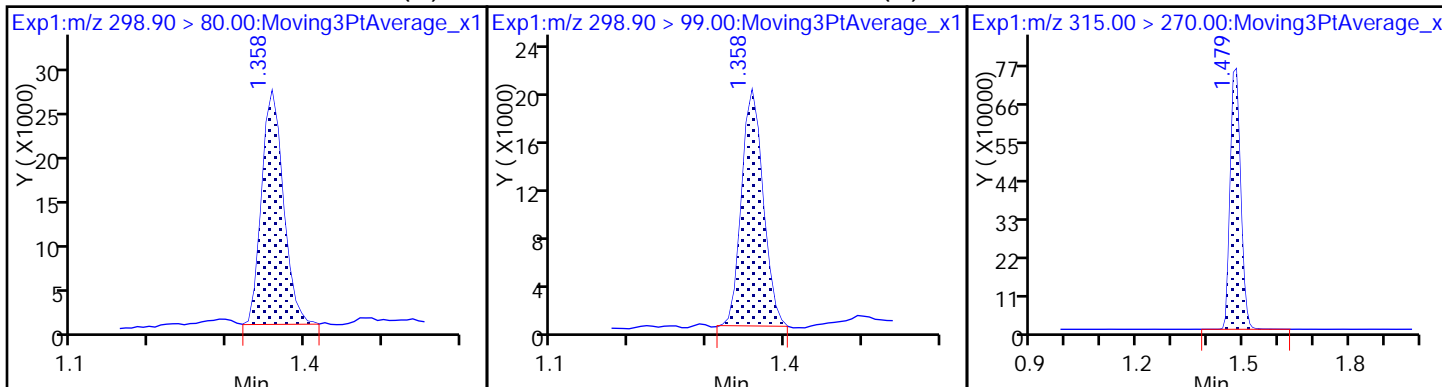
Review Flags

M - Manually Integrated

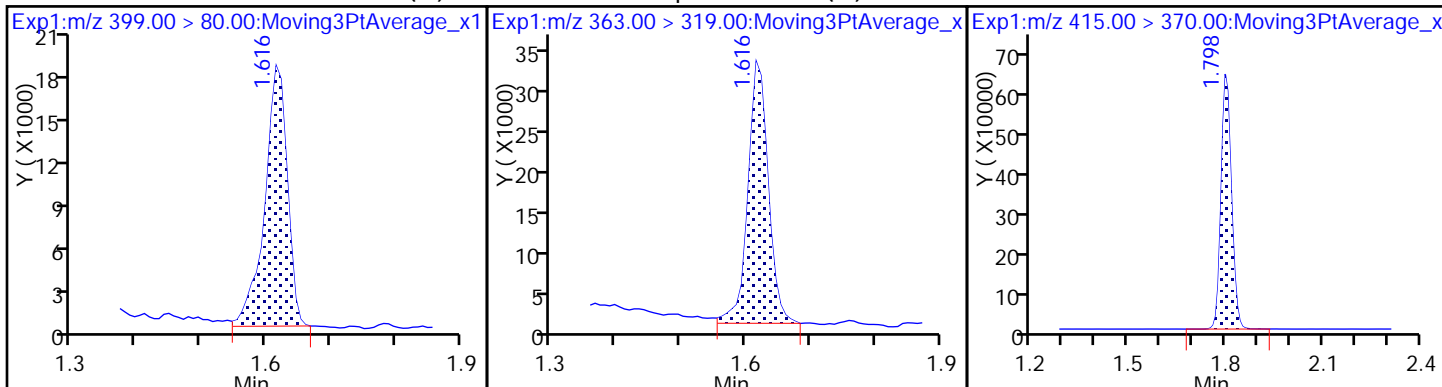
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_029.d
Injection Date: 08-Dec-2017 14:47:25 Instrument ID: A8_N
Lims ID: 320-33890-A-13-A Lab Sample ID: 320-33890-13
Client ID: WGNA-120417-DUP13
Operator ID: SACINSTLCMS01 ALS Bottle#: 48 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

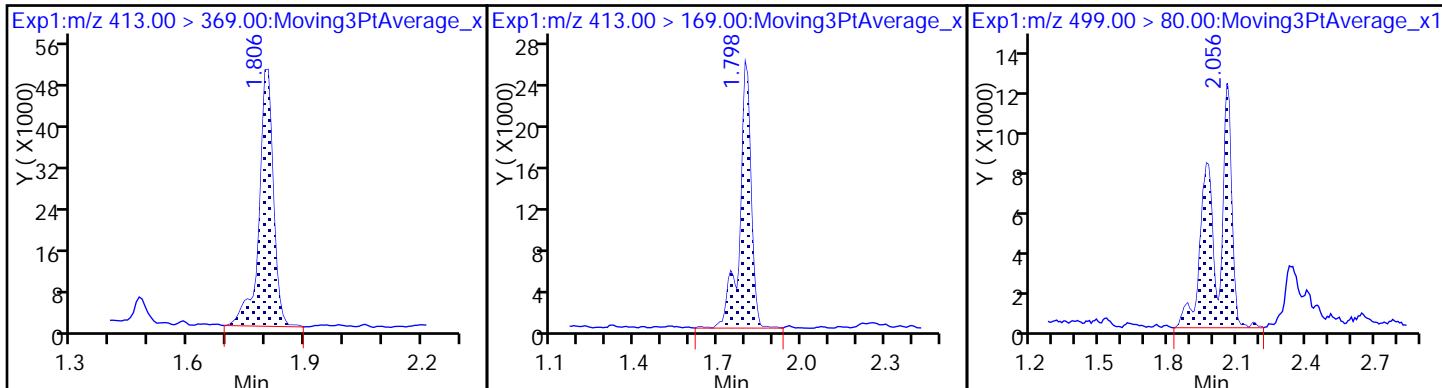
1 Perfluorobutanesulfonic acid (M) 1 Perfluorobutanesulfonic acid (M) \$ 2 13C2 PFHxA



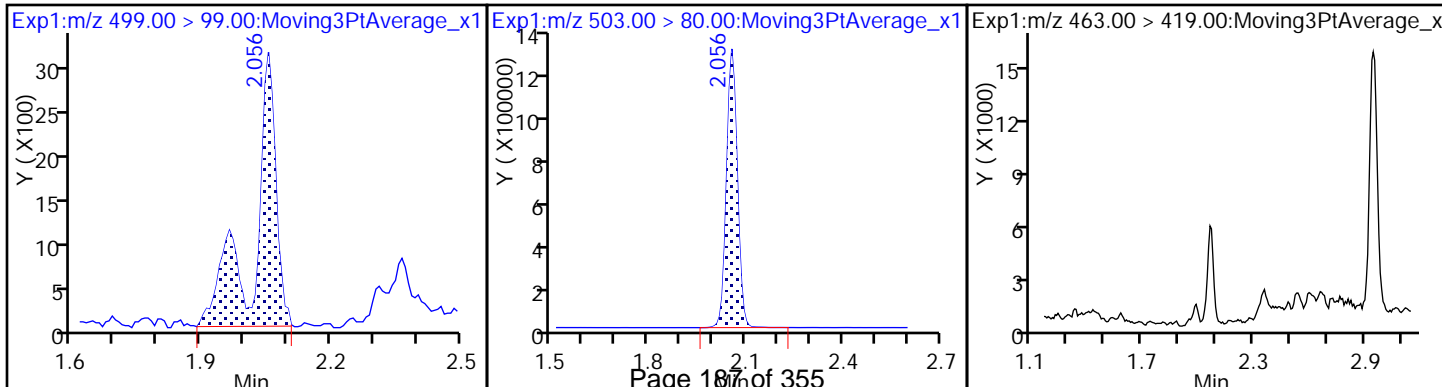
3 Perfluorohexanesulfonic acid (M) 4 Perfluoroheptanoic acid (M) * 6 13C2-PFOA



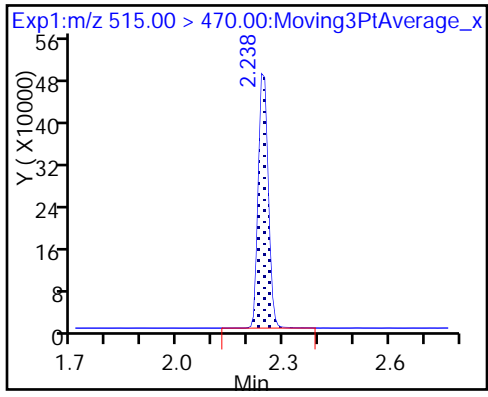
5 Perfluorooctanoic acid 5 Perfluorooctanoic acid 8 Perfluorooctane sulfonic acid



8 Perfluorooctane sulfonic acid (M) * 7 13C4 PFOS 9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_029.d
 Lims ID: 320-33890-A-13-A
 Client ID: WGNA-120417-DUP13
 Sample Type: Client
 Inject. Date: 08-Dec-2017 14:47:25 ALS Bottle#: 48 Worklist Smp#: 19
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-33890-a-13-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Dec-2017 10:36:43 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: XAWRK015

First Level Reviewer: barnettj Date: 11-Dec-2017 10:01:54

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.62	96.22
\$ 10 13C2 PFDA	10.0	8.55	85.52

TestAmerica Sacramento

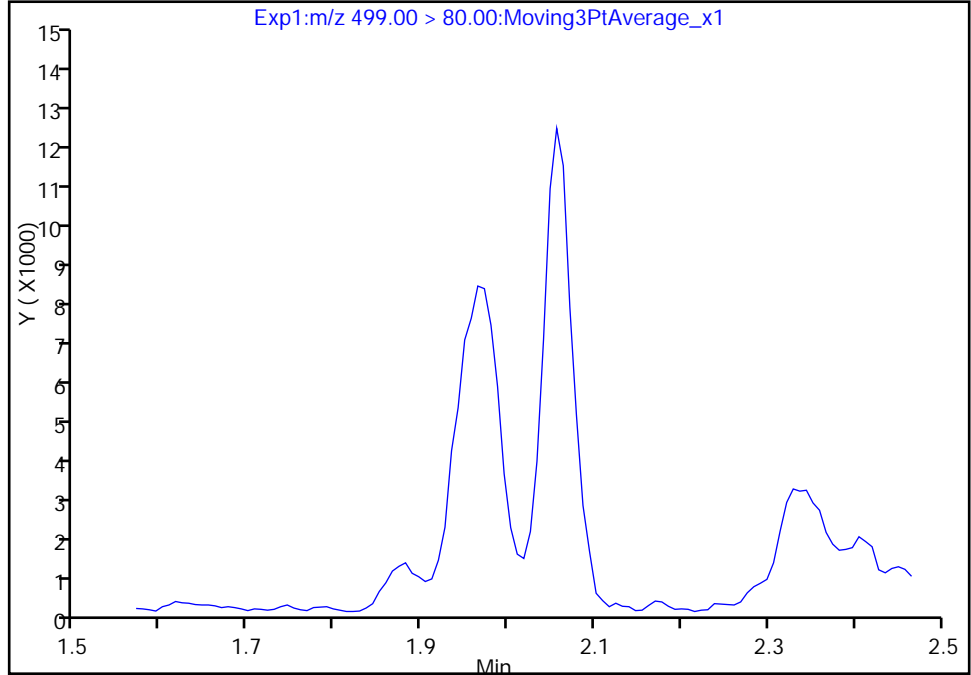
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_029.d
Injection Date: 08-Dec-2017 14:47:25 Instrument ID: A8_N
Lims ID: 320-33890-A-13-A Lab Sample ID: 320-33890-13
Client ID: WGNA-120417-DUP13
Operator ID: SACINSTLCMS01 ALS Bottle#: 48 Worklist Smp#: 19
Injection Vol: 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

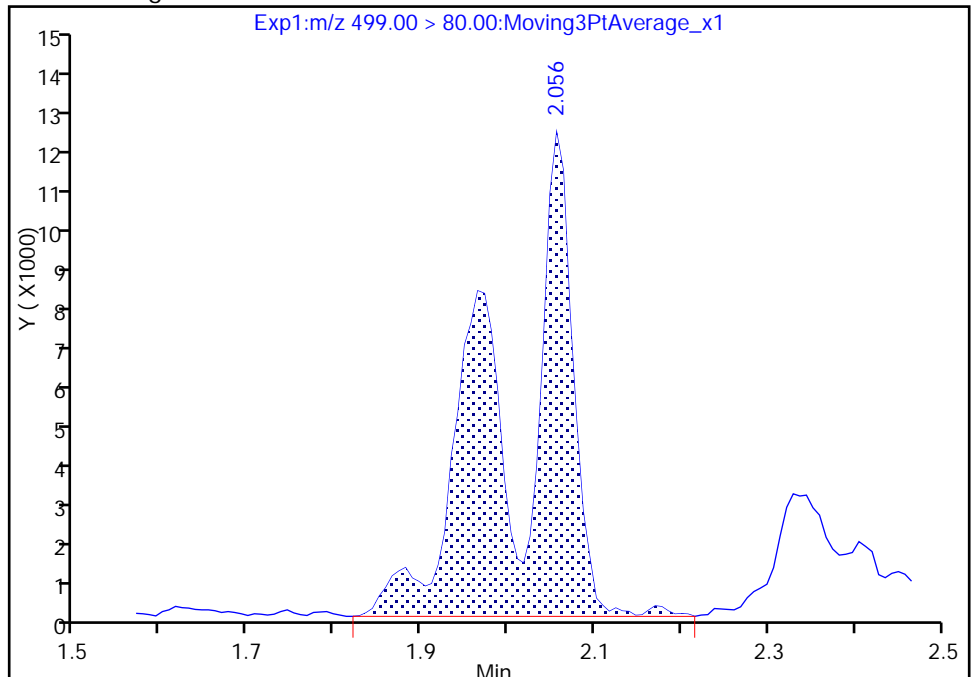
Not Detected
Expected RT: 2.06

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 64042
Amount: 0.658600
Amount Units: ng/ml



Reviewer: barnettj, 11-Dec-2017 10:00:27
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_029.d

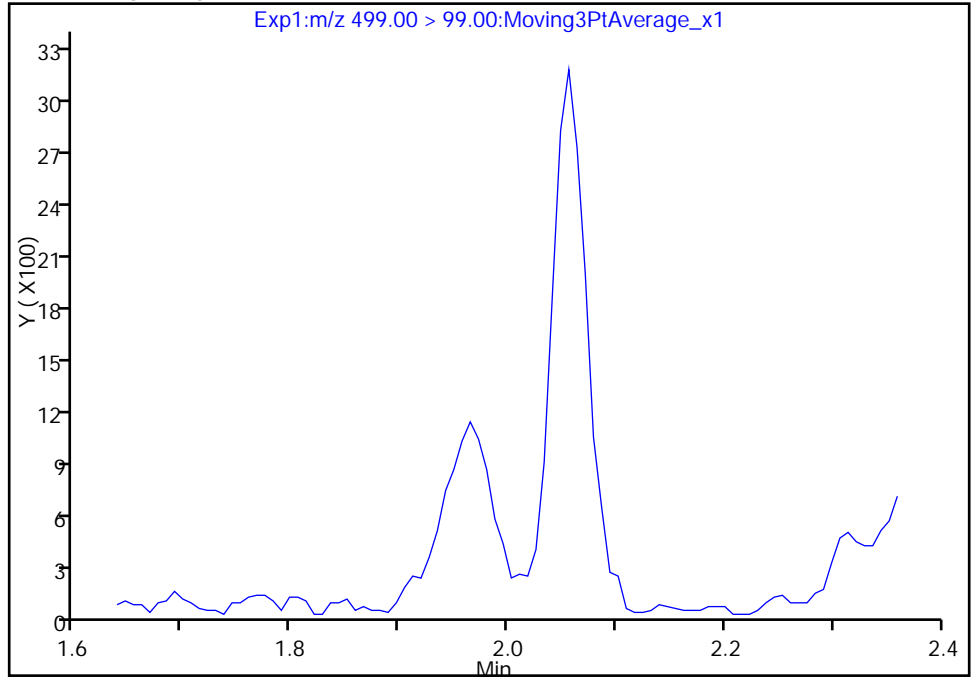
Injection Date: 08-Dec-2017 14:47:25 Instrument ID: A8_N
Lims ID: 320-33890-A-13-A Lab Sample ID: 320-33890-13
Client ID: WGNA-120417-DUP13
Operator ID: SACINSTLCMS01 ALS Bottle#: 48 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

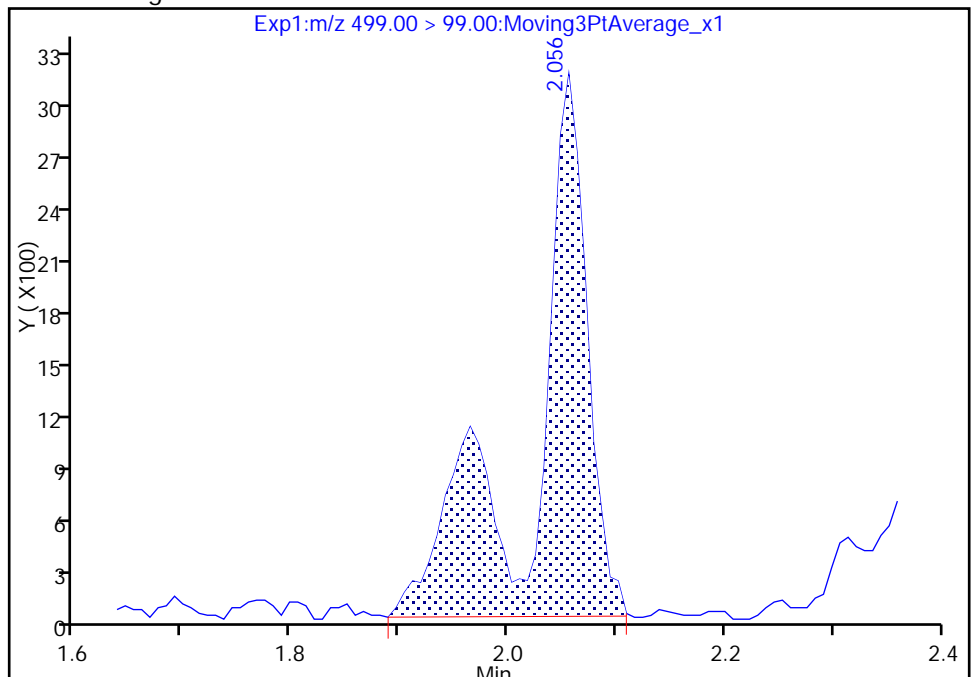
Not Detected
Expected RT: 2.06

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 11036
Amount: 0.658600
Amount Units: ng/ml



Reviewer: barnettj, 11-Dec-2017 10:00:48

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

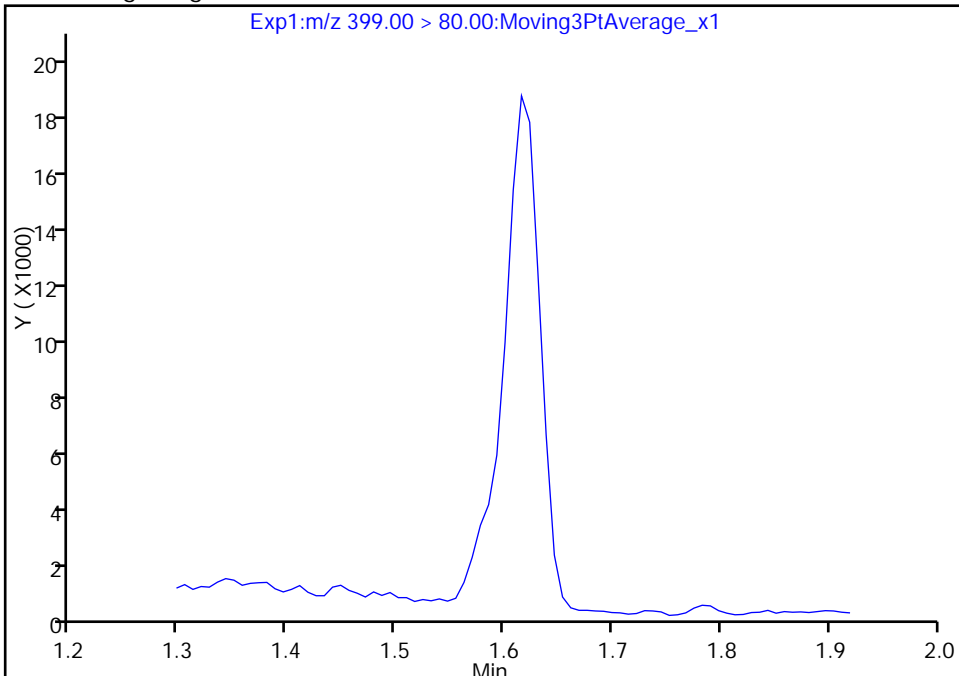
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_029.d
Injection Date: 08-Dec-2017 14:47:25 Instrument ID: A8_N
Lims ID: 320-33890-A-13-A Lab Sample ID: 320-33890-13
Client ID: WGNA-120417-DUP13
Operator ID: SACINSTLCMS01 ALS Bottle#: 48 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

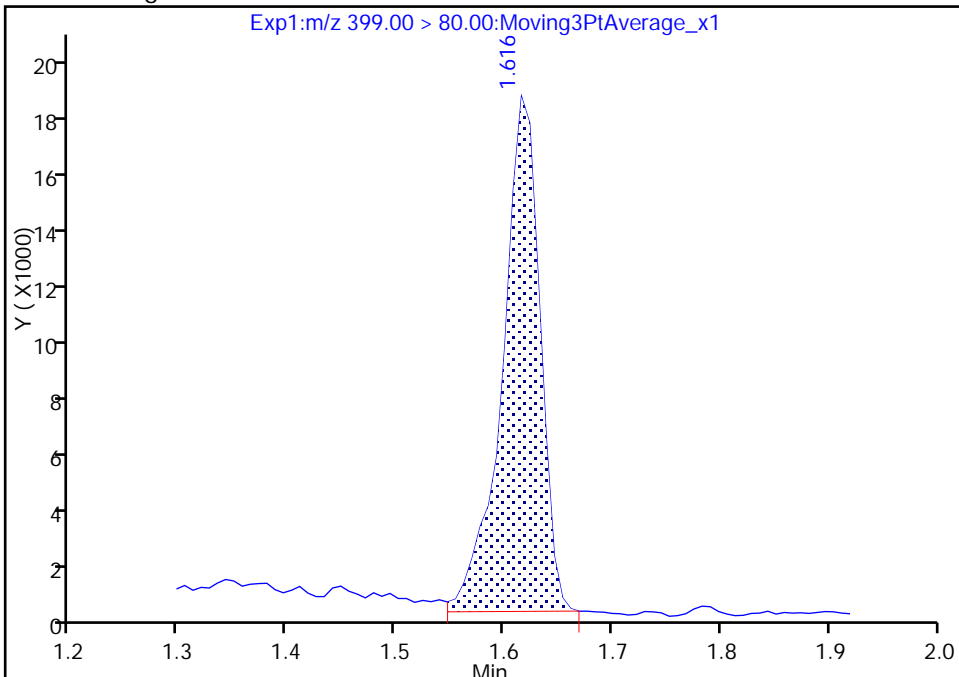
Not Detected
Expected RT: 1.72

Processing Integration Results



Manual Integration Results

RT: 1.62
Area: 43398
Amount: 0.250312
Amount Units: ng/ml



Reviewer: barnettj, 11-Dec-2017 10:01:28
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

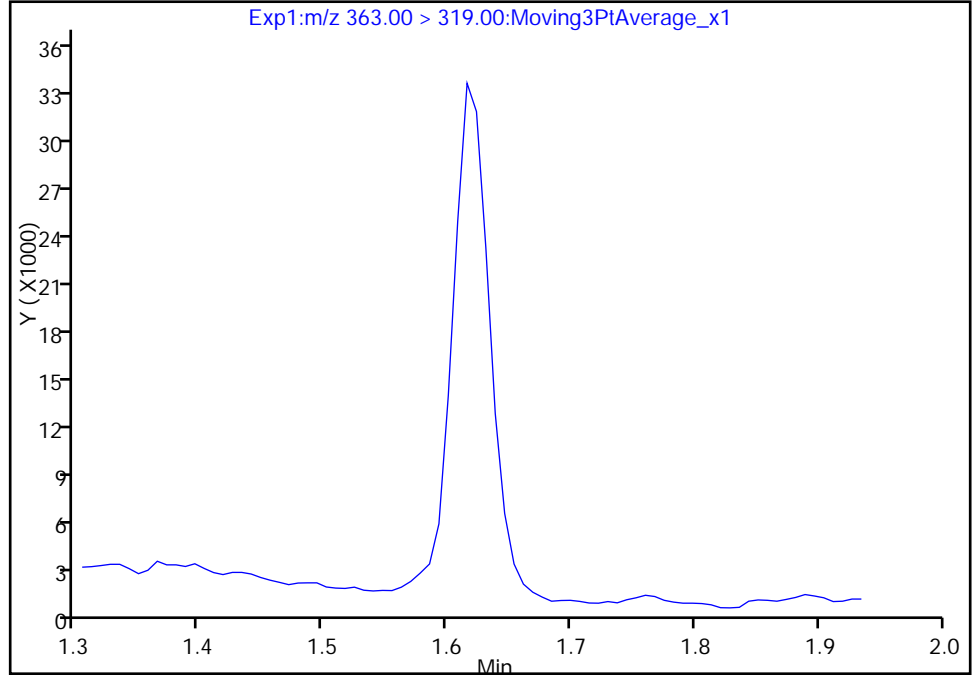
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Injection Date: 08-Dec-2017 14:47:25 Instrument ID: A8_N
Lims ID: 320-33890-A-13-A Lab Sample ID: 320-33890-13
Client ID: WGNA-120417-DUP13
Operator ID: SACINSTLCMS01 ALS Bottle#: 48 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

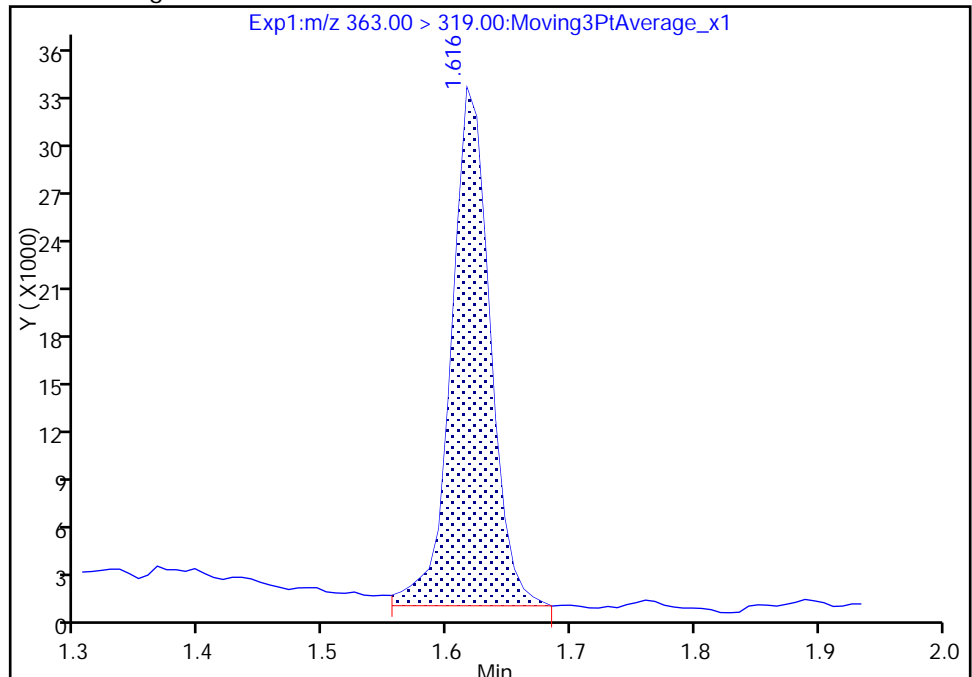
Not Detected
Expected RT: 1.72

Processing Integration Results



Manual Integration Results

RT: 1.62
Area: 69290
Amount: 0.518122
Amount Units: ng/ml



Reviewer: barnettj, 11-Dec-2017 10:01:39
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

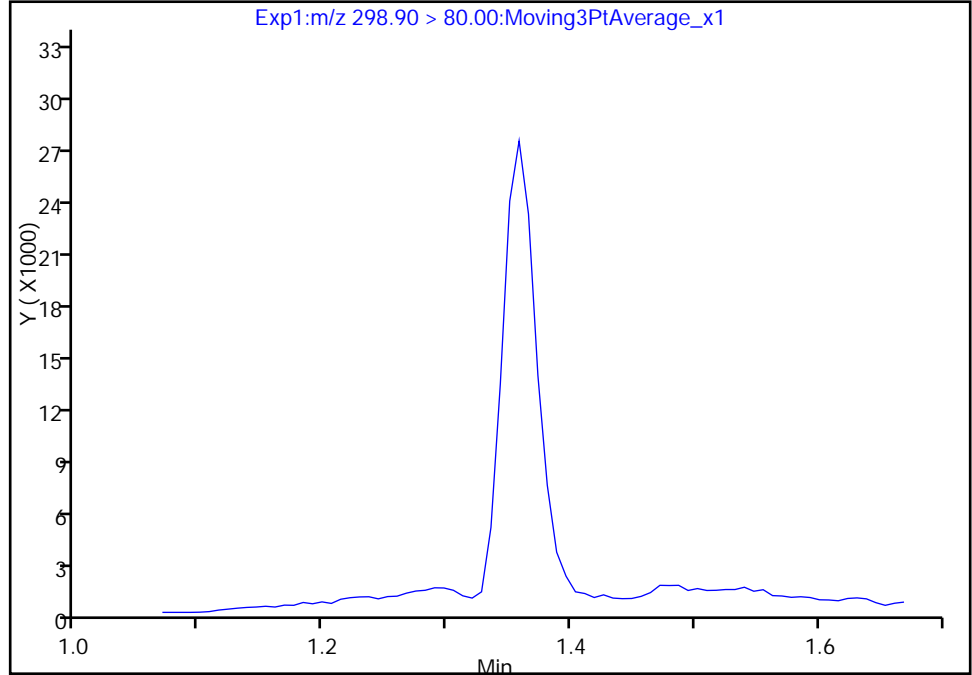
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Injection Date: 08-Dec-2017 14:47:25 Instrument ID: A8_N
Lims ID: 320-33890-A-13-A Lab Sample ID: 320-33890-13
Client ID: WGNA-120417-DUP13
Operator ID: SACINSTLCMS01 ALS Bottle#: 48 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

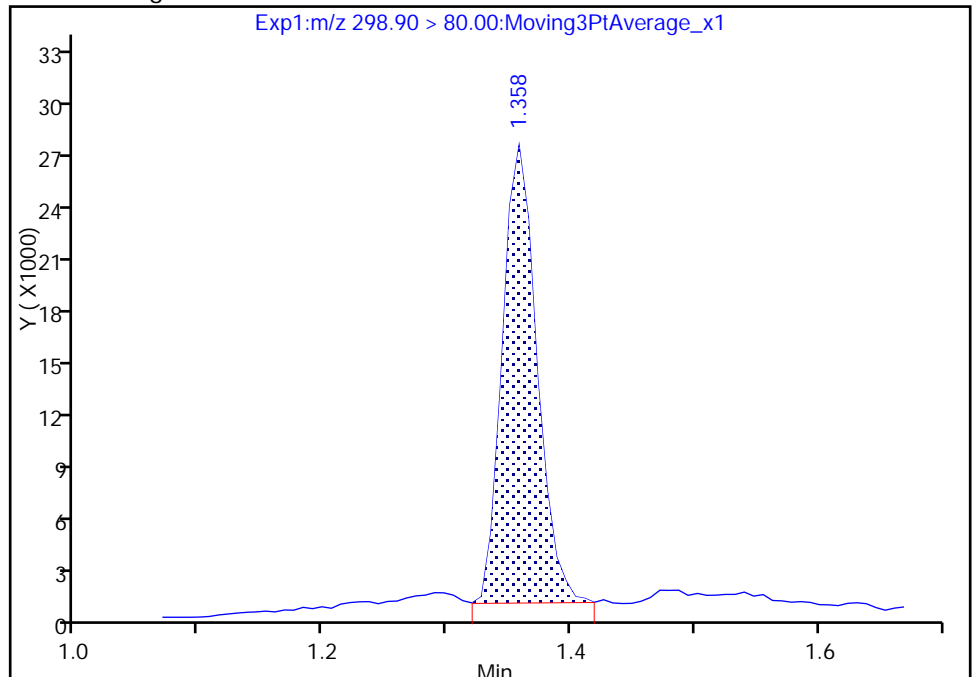
Not Detected
Expected RT: 1.44

Processing Integration Results



Manual Integration Results

RT: 1.36
Area: 51641
Amount: 0.445765
Amount Units: ng/ml



Reviewer: barnettj, 11-Dec-2017 10:01:12
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

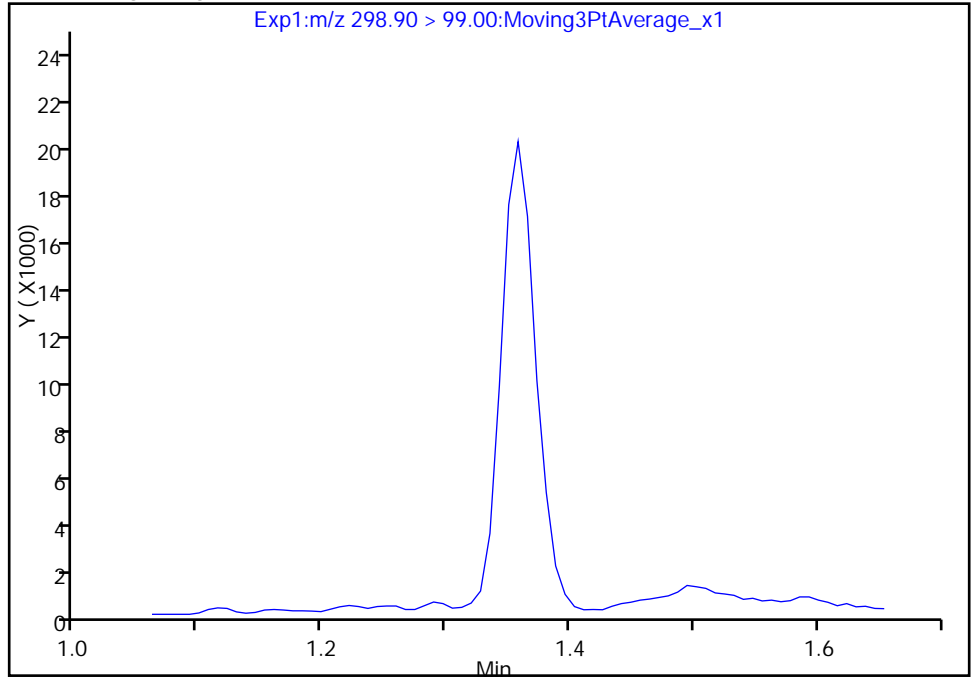
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171208-51542.b\2017.12.08_537AA_029.d
Injection Date: 08-Dec-2017 14:47:25 Instrument ID: A8_N
Lims ID: 320-33890-A-13-A Lab Sample ID: 320-33890-13
Client ID: WGNA-120417-DUP13
Operator ID: SACINSTLCMS01 ALS Bottle#: 48 Worklist Smp#: 19
Injection Vol: 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

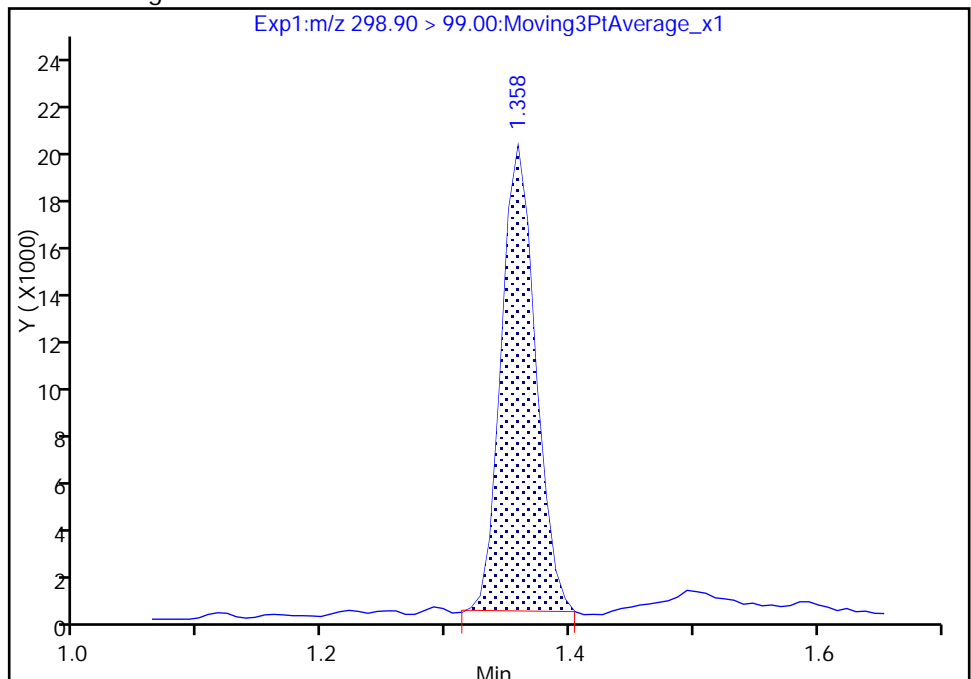
Not Detected
Expected RT: 1.44

Processing Integration Results



Manual Integration Results

RT: 1.36
Area: 37025
Amount: 0.445765
Amount Units: ng/ml



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

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1 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.: 320-33890-1 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)	13PF OA	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)	13PF OA	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)	13PF OA	Ave	201053 4019666	453612	1020851	2106479	3023088	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PF OA	Ave	1655691 1664260	1708988	1701491	1719911	1675220	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	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.: 320-33890-1 Analy Batch No.: 192908

SDG No.: _____

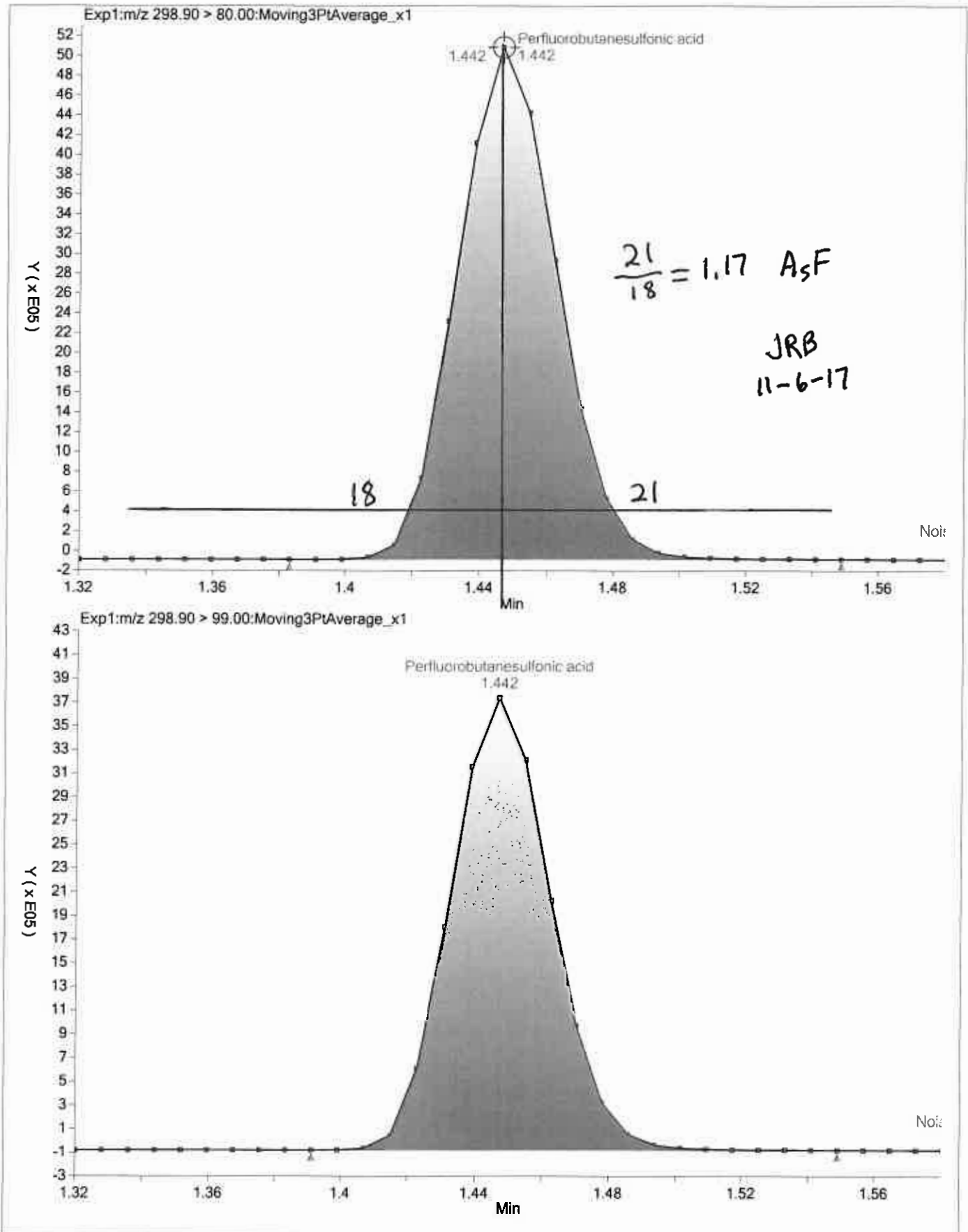
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3 (mm) Heated Purge: (Y/N) N

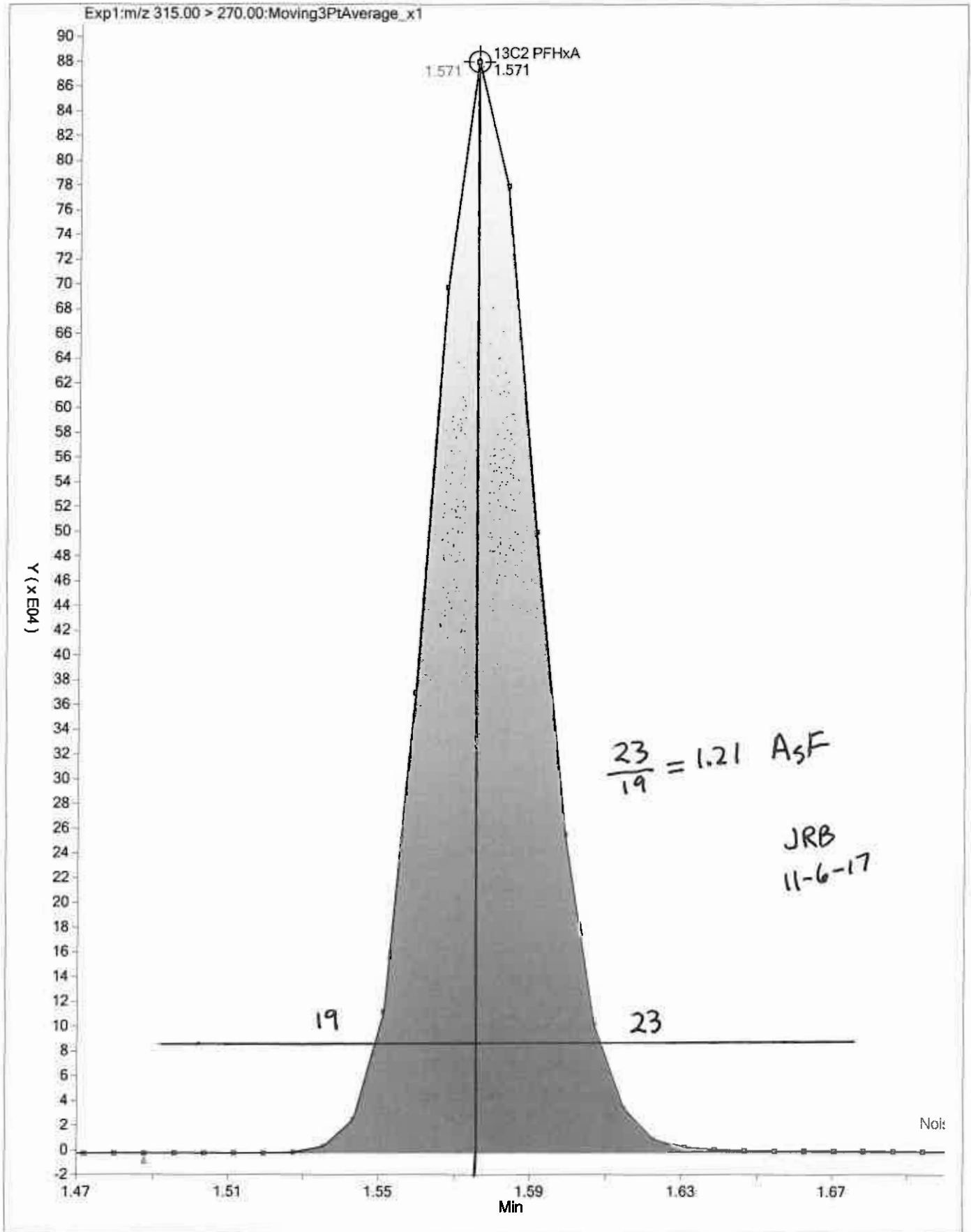
Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

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





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			1485386 51.9	3471256 55.5
# 2 RB	03-Nov-2017 13:28:38			1511056 52.8	3340239 53.4
# 3 RB	03-Nov-2017 13:33:19			1483949 51.8	3285228 52.5
	IS Std				
# 4 IC L1	03-Nov-2017 13:37:59	1.58 98.98	2.31 101.30	1520258> 100.0*	3298877> 100.0*
# 5 IC L2	03-Nov-2017 13:42:39	1.58 95.66	2.31 95.33	1623614> 106.8*	3450592> 104.6*
# 6 IC L3	03-Nov-2017 13:47:20	1.57 100.40	2.31 98.91	1540946> 101.4*	3194016> 96.8*
# 7 IC L4	03-Nov-2017 13:52:00	1.57 101.10	2.31 102.10	1546307> 101.7*	3374600> 102.3*
# 8 IC L5	03-Nov-2017 13:56:41	1.57 97.90	2.31 95.80	1555174> 102.3*	3199479> 97.0*
# 9 IC L6	03-Nov-2017 14:01:24	1.57 106.00	2.31 106.60	1426806> 93.9*	3141787> 95.2*
	IS Std			1540946 1.91	3194016 2.15
#10 RB	03-Nov-2017 14:06:04			1395383 90.6	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	1586829 102.6	3305852 98.0
	IS Std			1586829 1.91	3305852 2.15
#12 RB	03-Nov-2017 14:15:23			1415042 89.2	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	1512045 97.8	3433628 101.7
	IS Std			1395100 1.91	3254950 2.15
#14 RB	03-Nov-2017 14:24:44			1395100 100.0	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									
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

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537ICAL_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

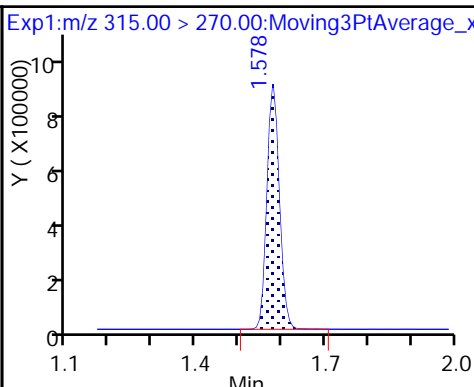
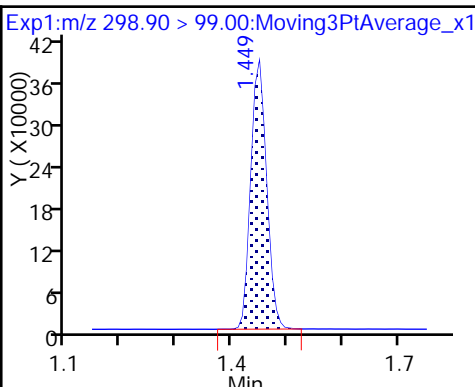
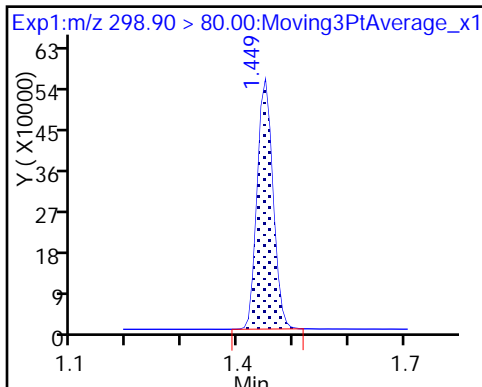
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

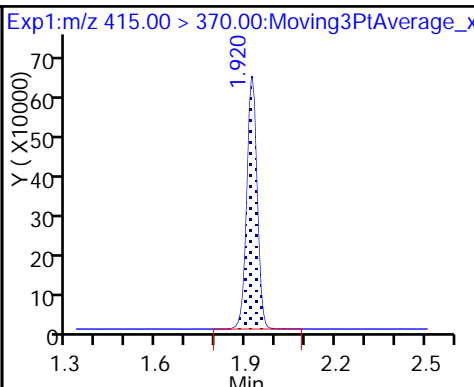
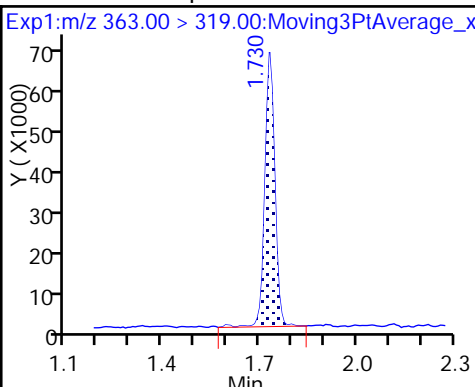
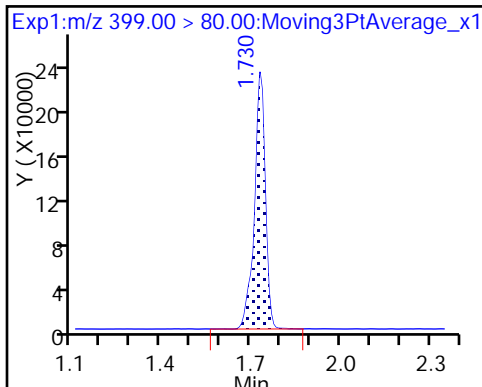
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

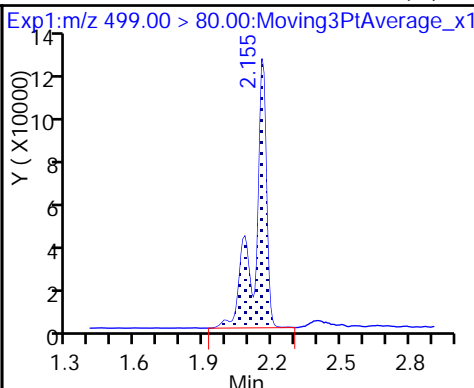
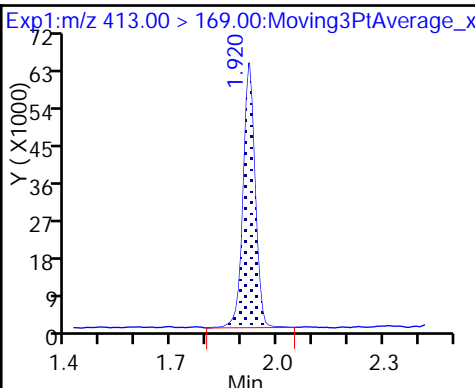
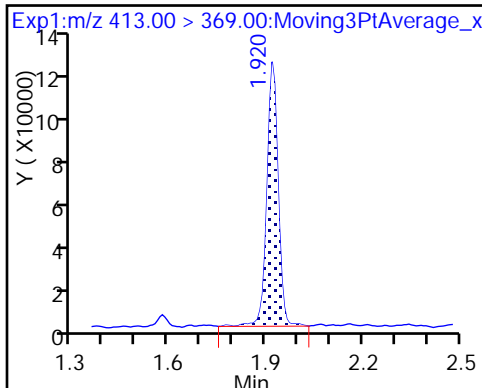
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

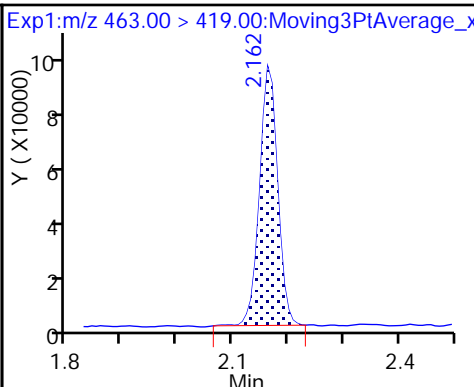
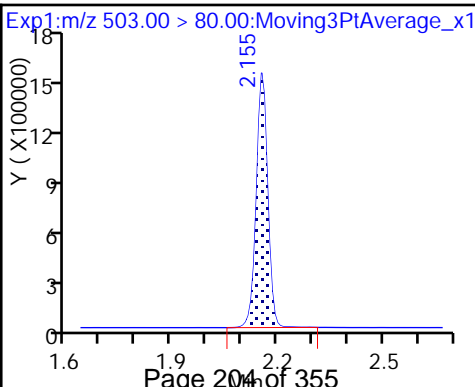
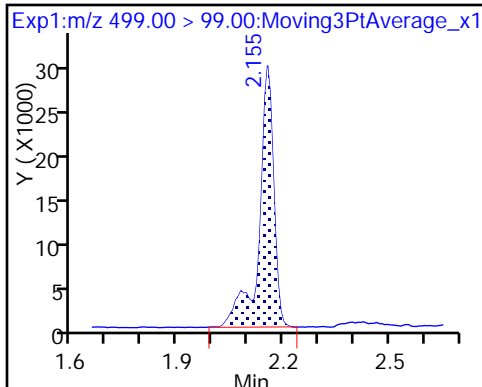
8 Perfluorooctane sulfonic acid (M)



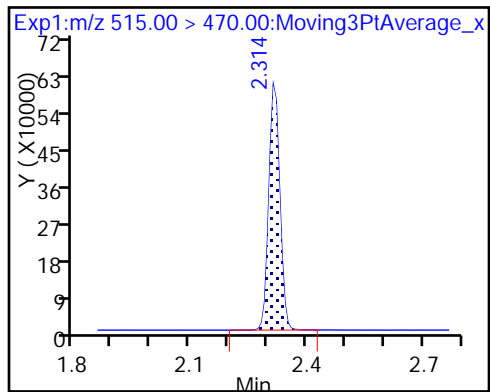
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



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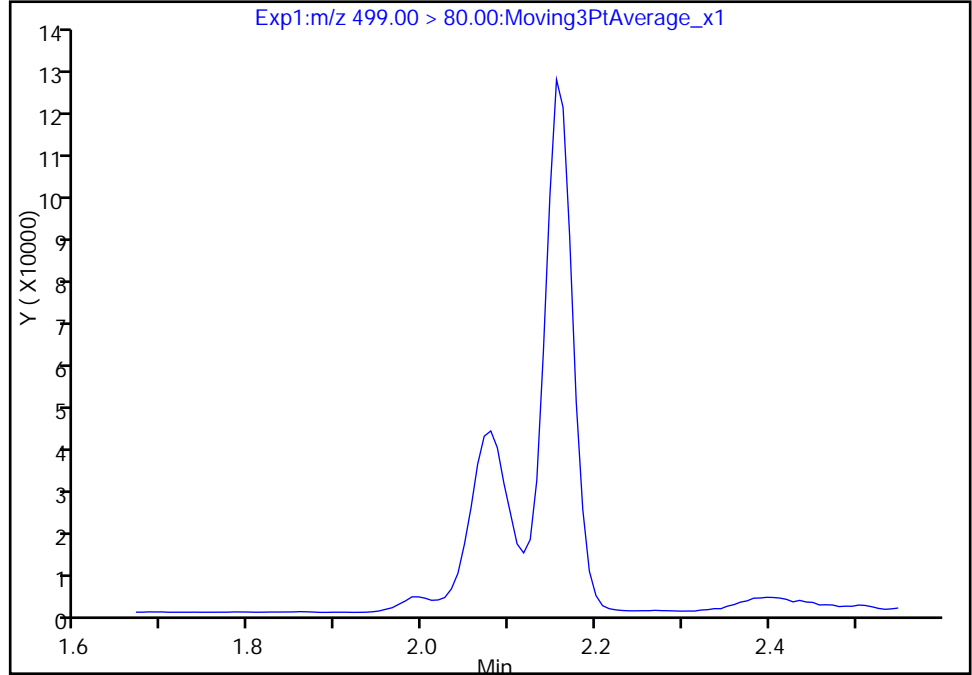
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Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

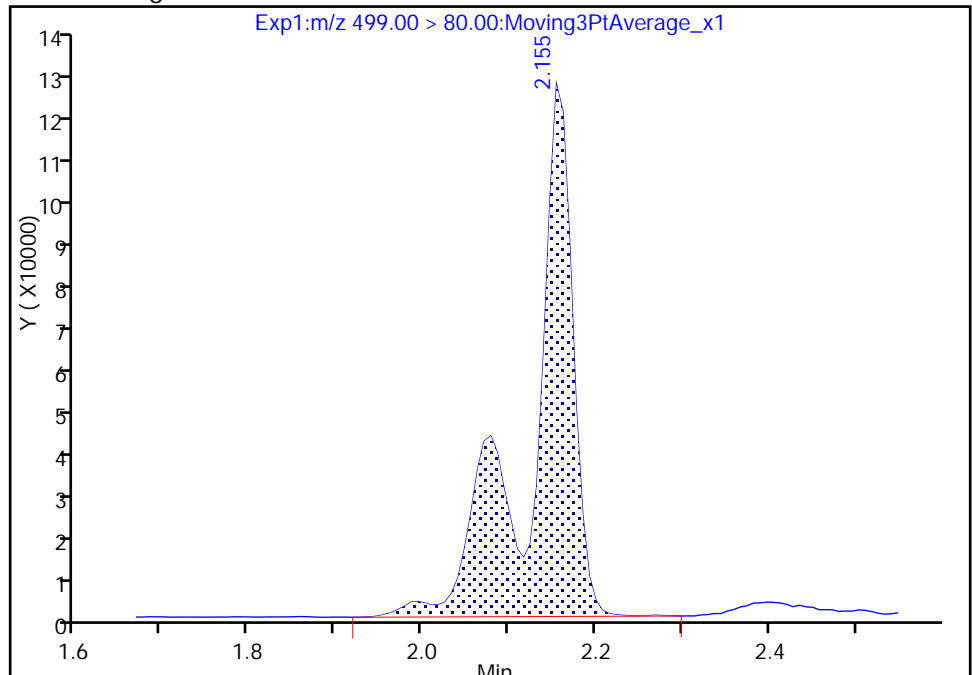
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 412315
Amount: 3.817687
Amount Units: ng/ml



TestAmerica Sacramento

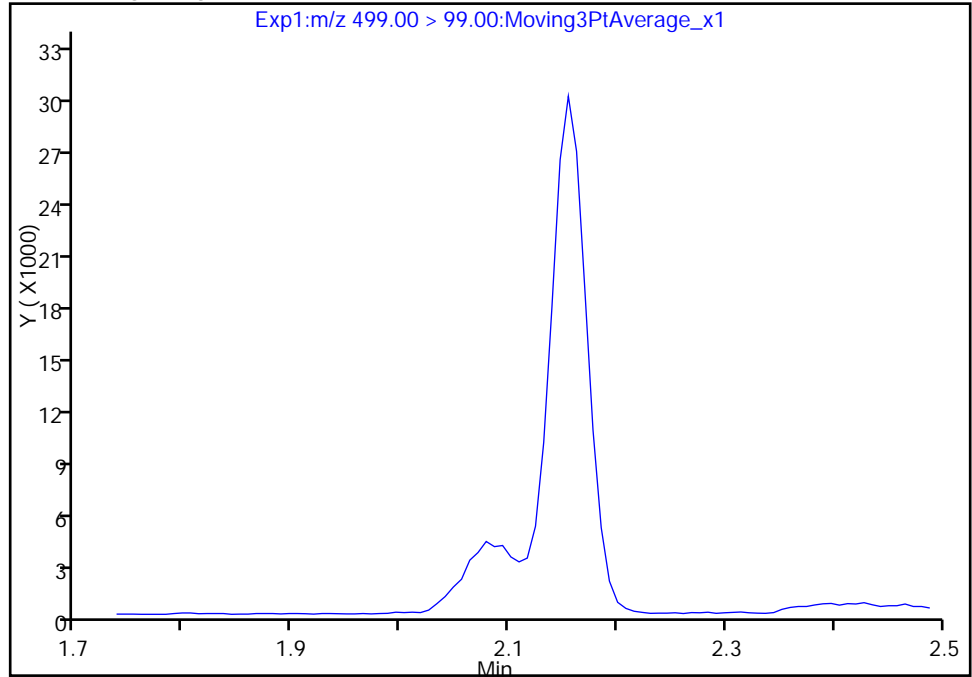
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Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

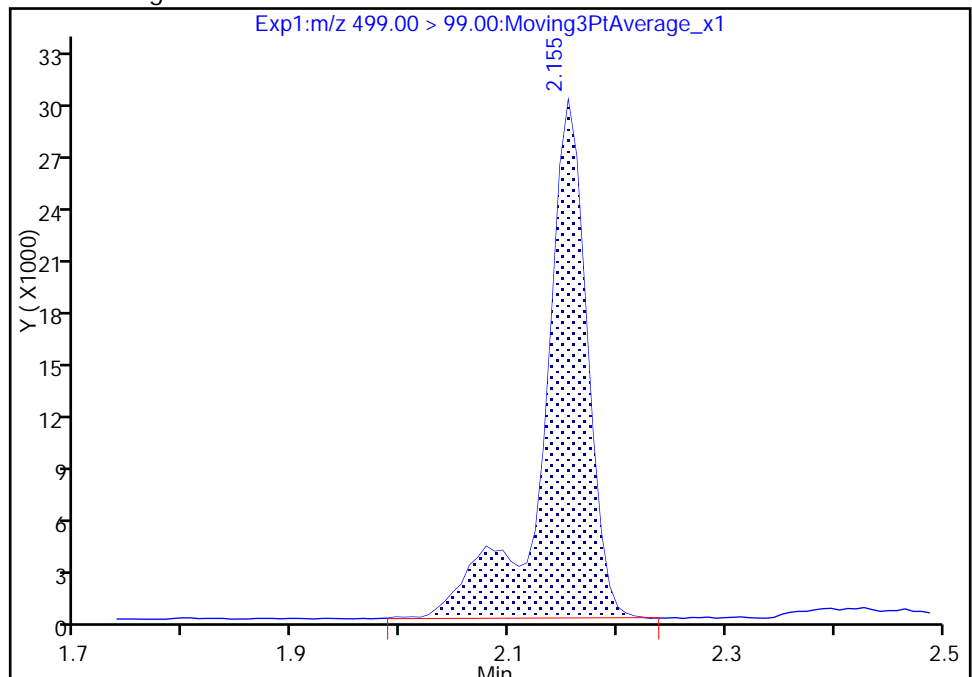
Not Detected
Expected RT: 2.15

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

TestAmerica Sacramento

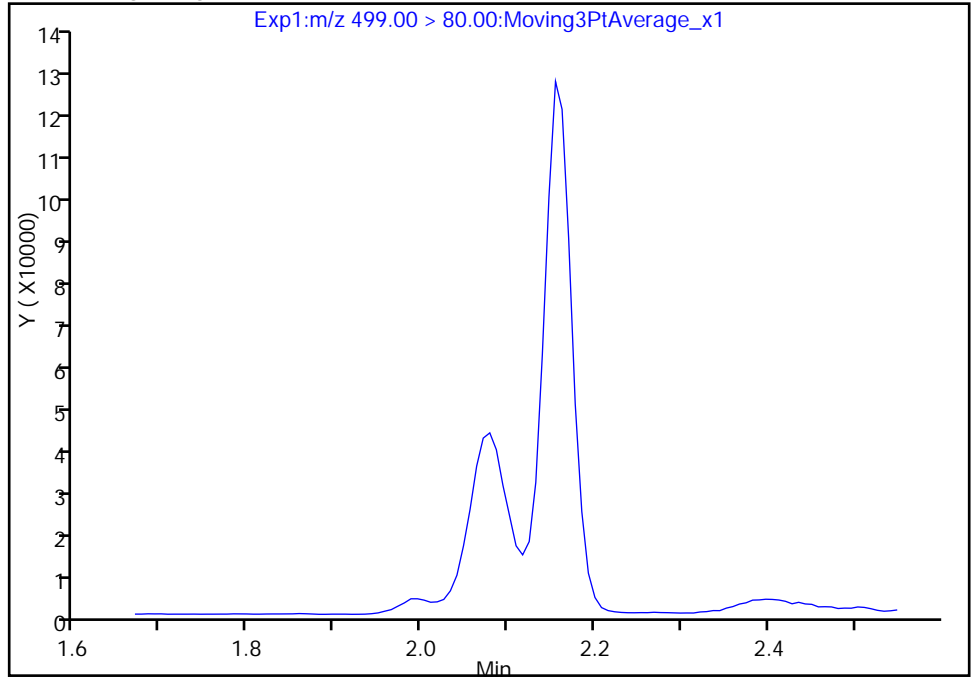
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Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

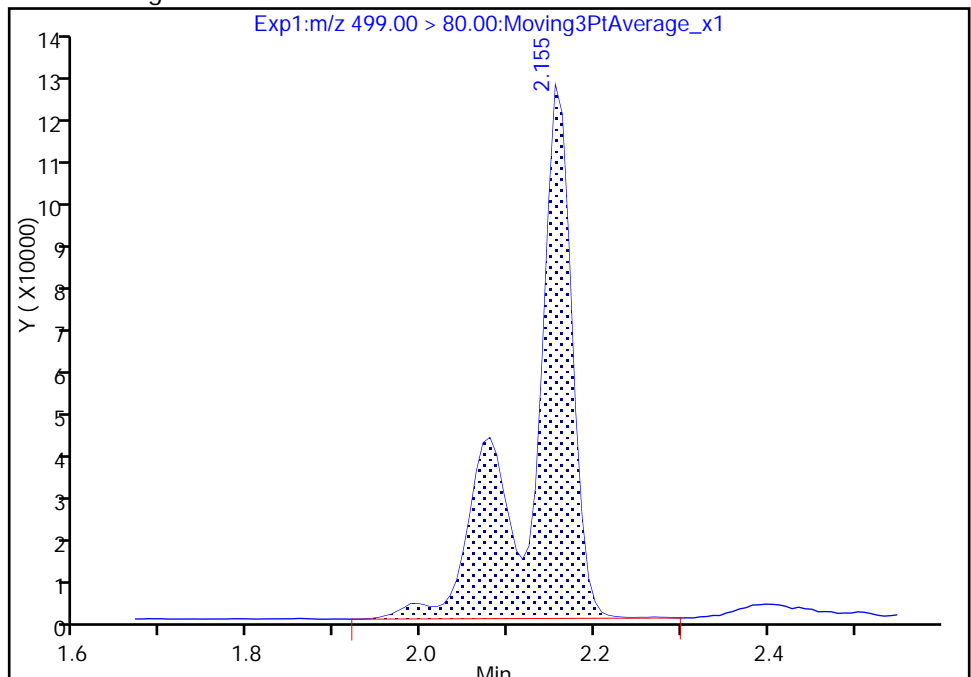
Not Detected
Expected RT: 2.15

Processing Integration Results



RT: 2.15
Area: 412315
Amount: 3.817687
Amount Units: ng/ml

Manual Integration Results



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									
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

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537ICAL_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

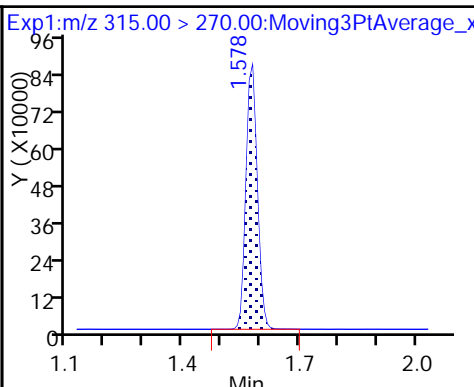
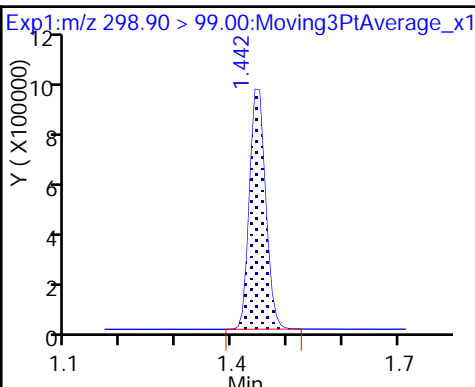
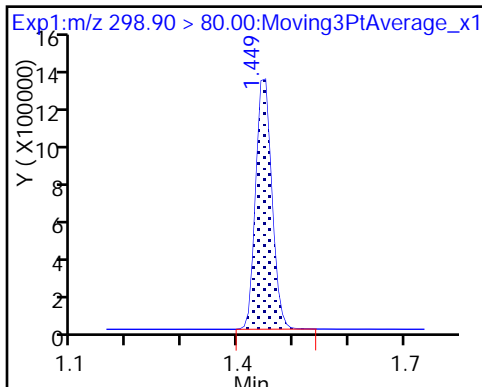
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

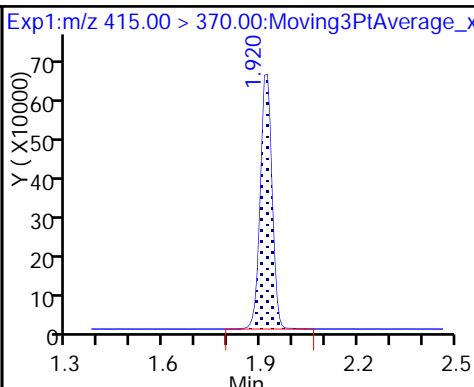
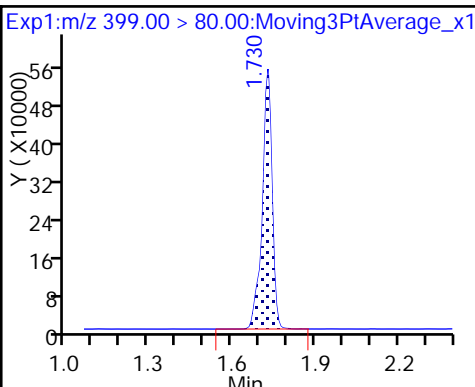
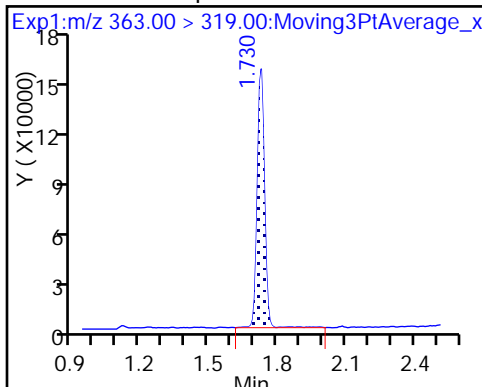
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

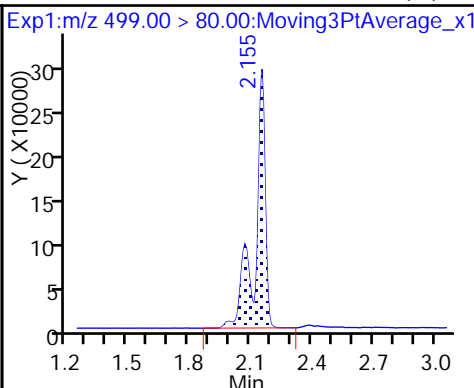
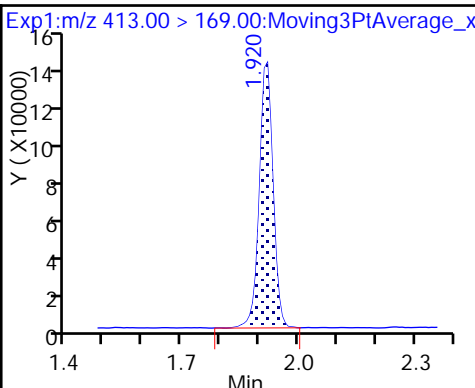
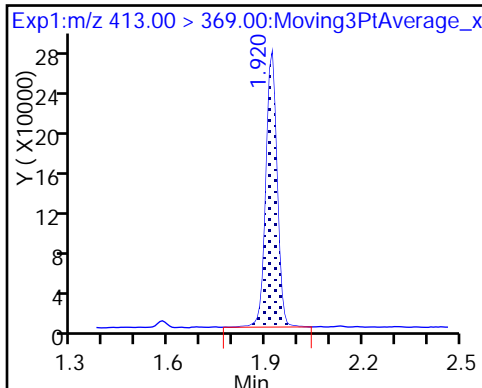
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

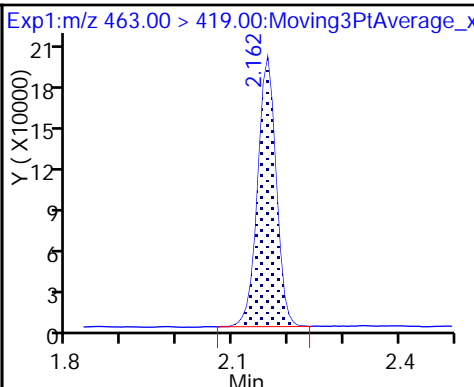
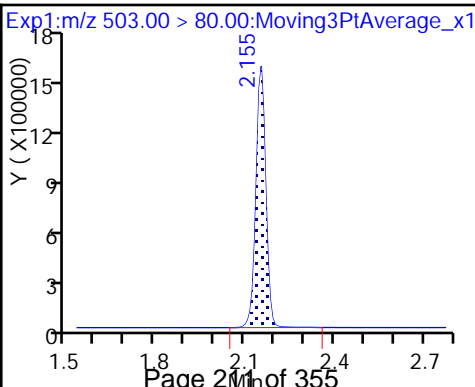
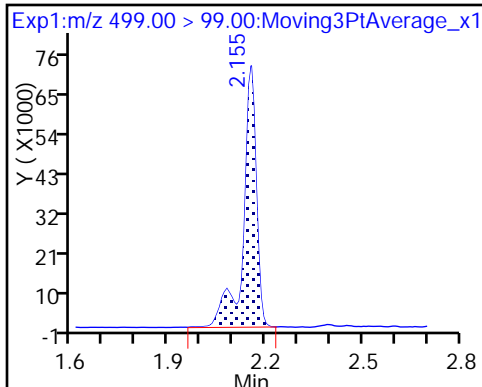
8 Perfluorooctane sulfonic acid (M)



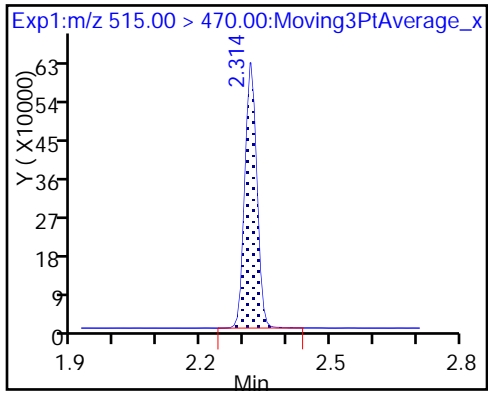
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

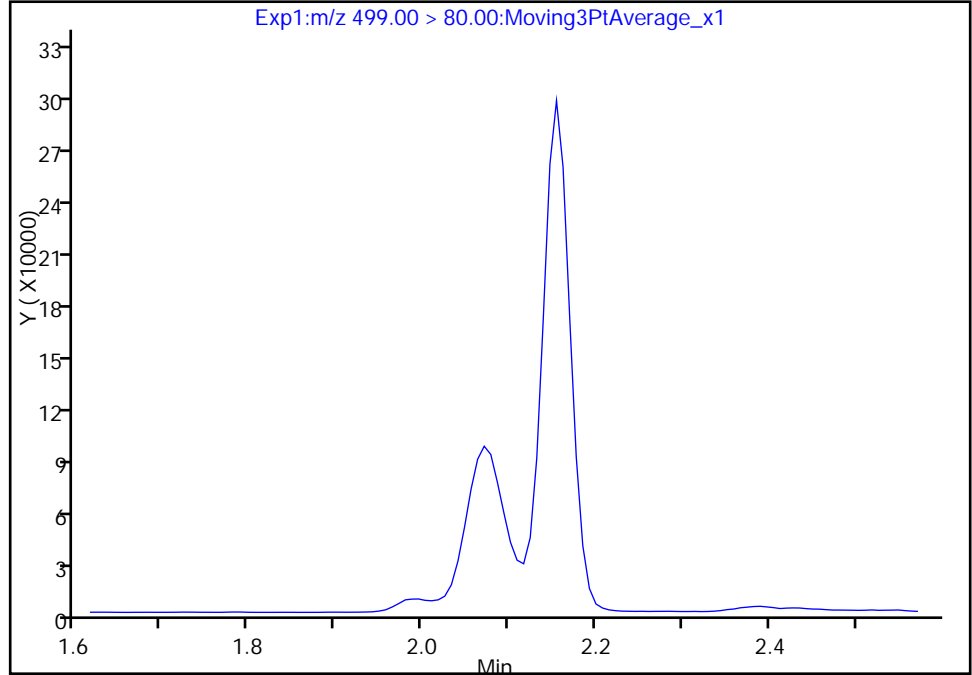
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Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

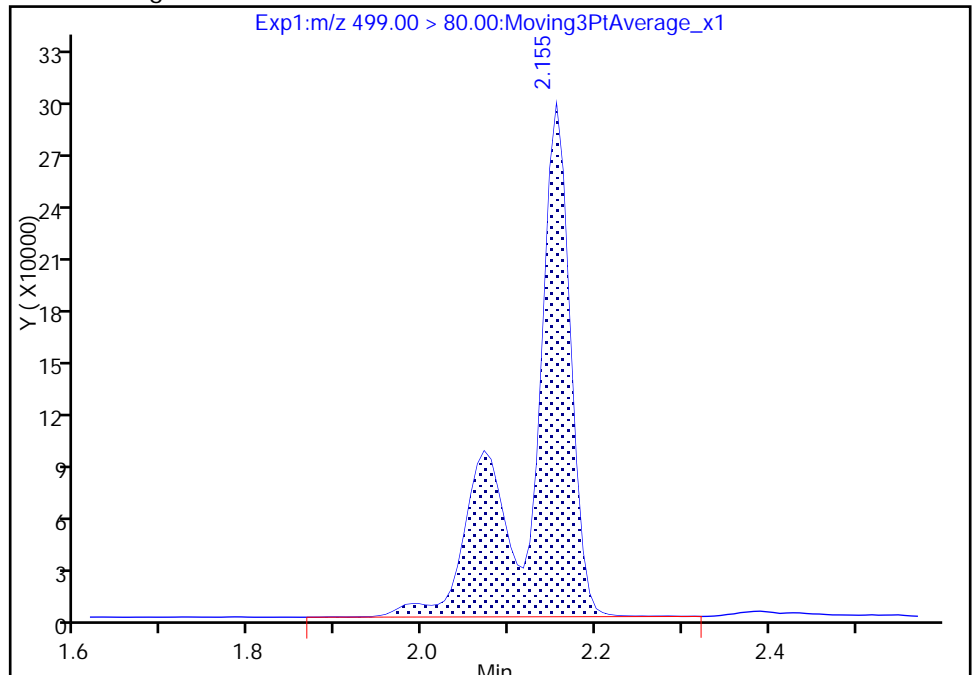
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 985487
Amount: 8.723576
Amount Units: ng/ml



TestAmerica Sacramento

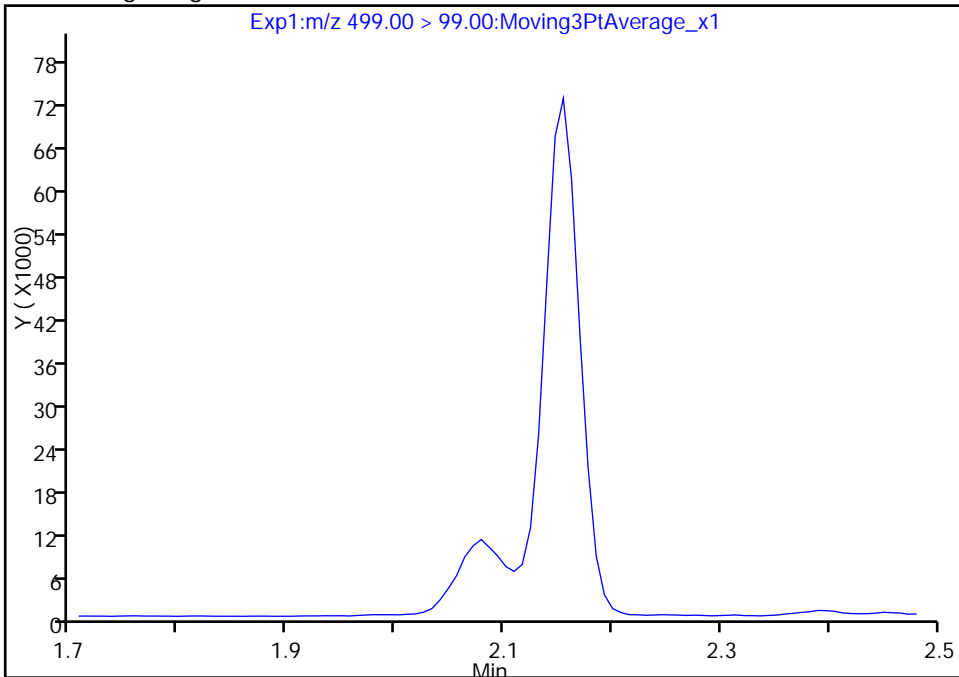
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Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

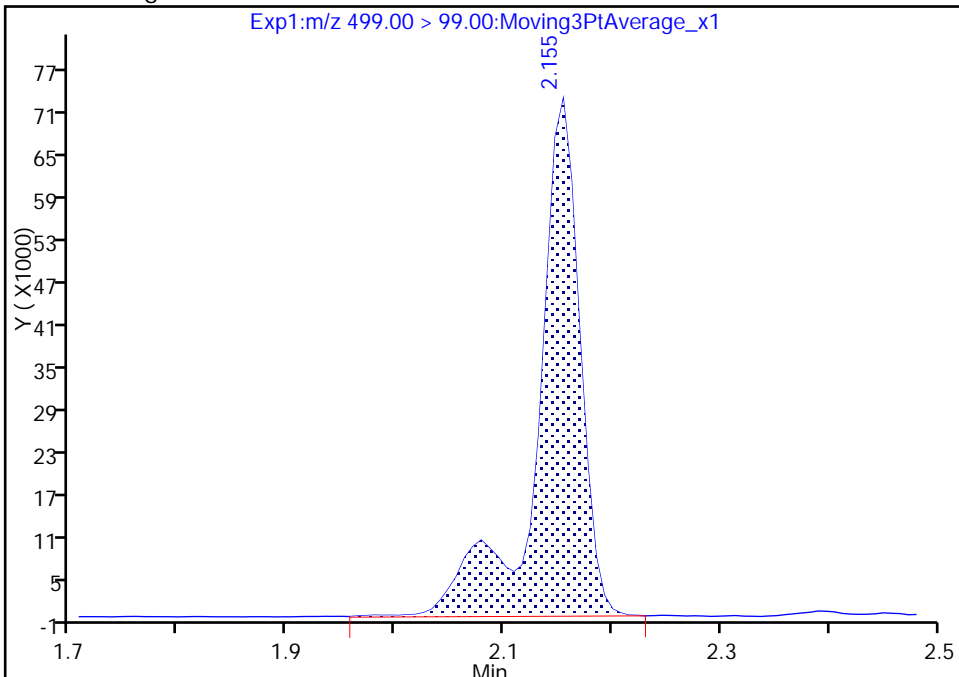
Not Detected
Expected RT: 2.15

Processing Integration Results



RT: 2.15
Area: 200739
Amount: 8.723576
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

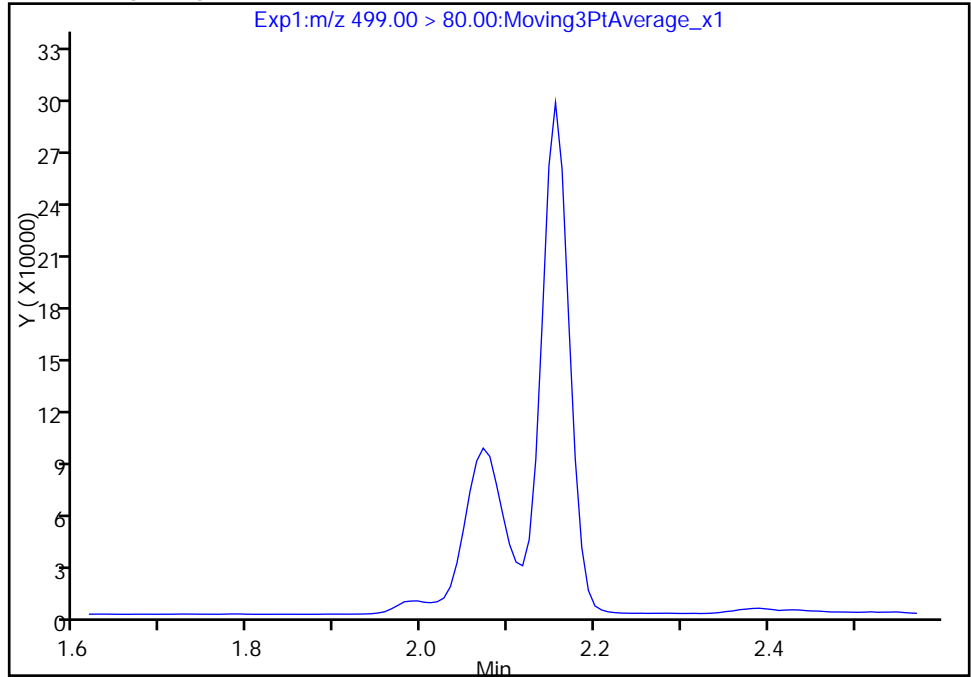
Data File: \\ChromNa\Sacramento\ChromData\A8_N\201711106-49975.b\2017.11.03_537XICAL_005.d
Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

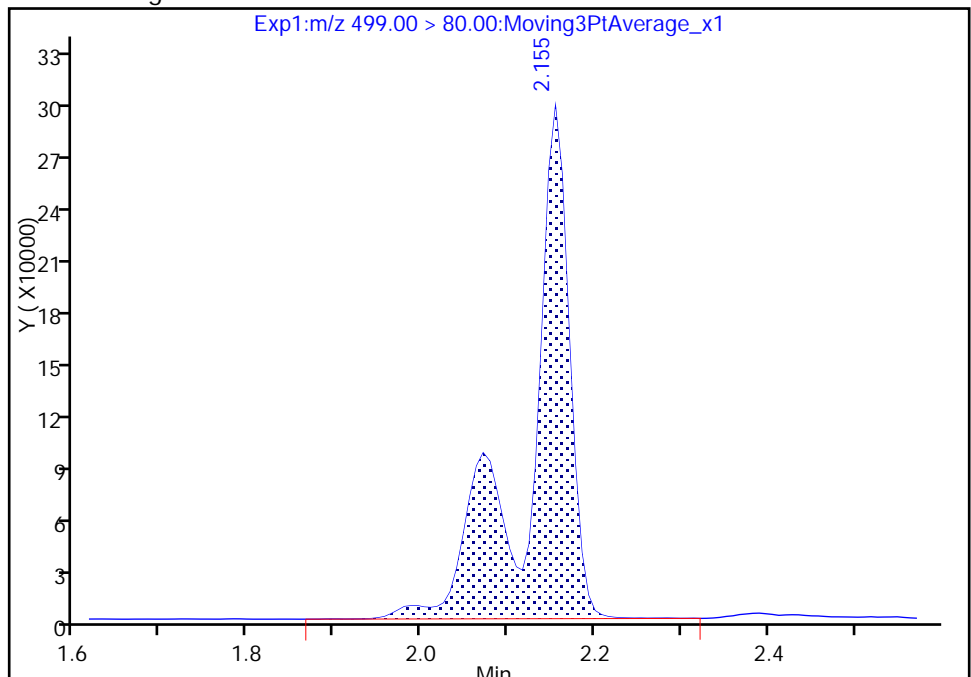
Not Detected
Expected RT: 2.15

Processing Integration Results



RT: 2.15
Area: 985487
Amount: 8.723576
Amount Units: ng/ml

Manual Integration Results



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

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537ICAL_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

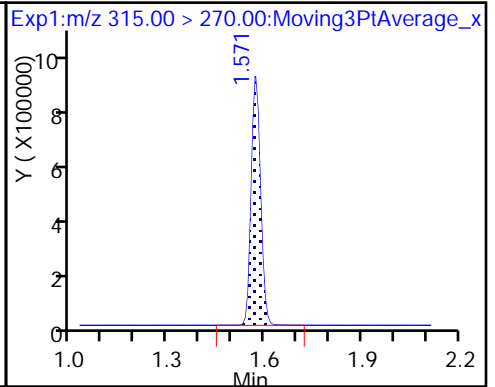
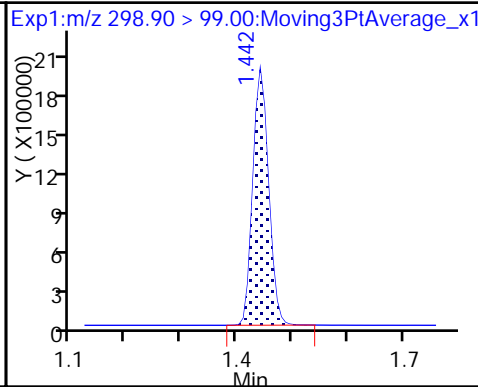
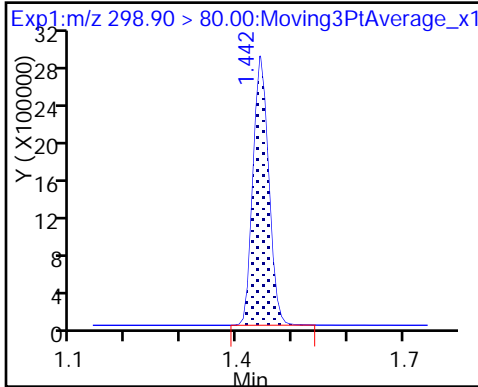
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

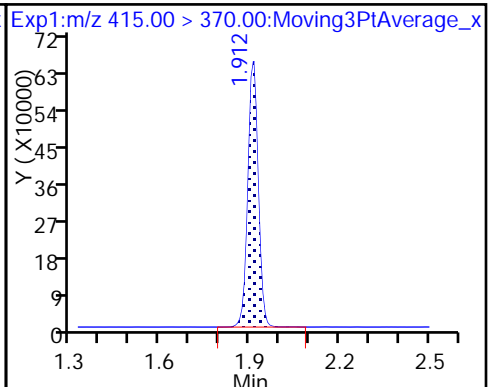
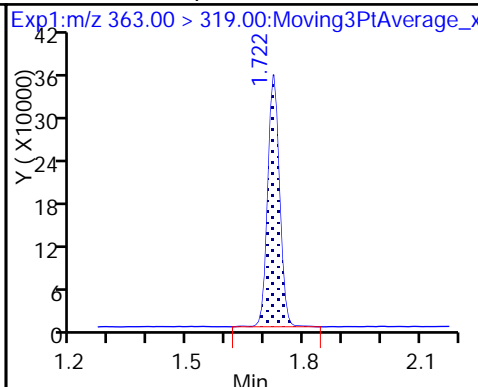
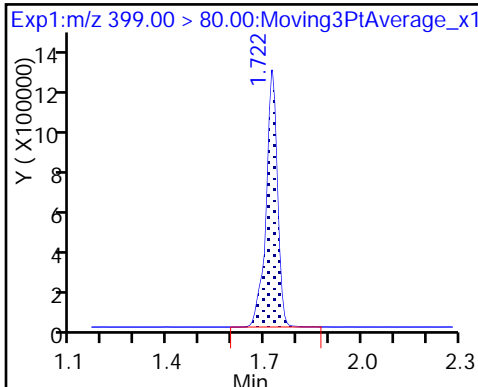
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

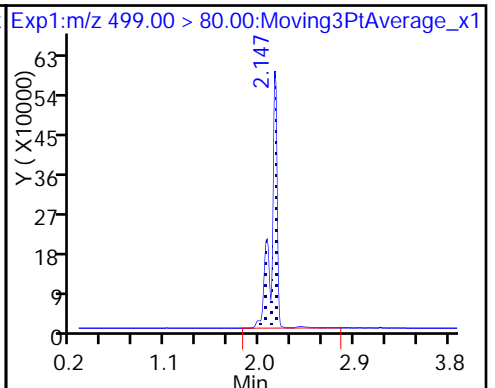
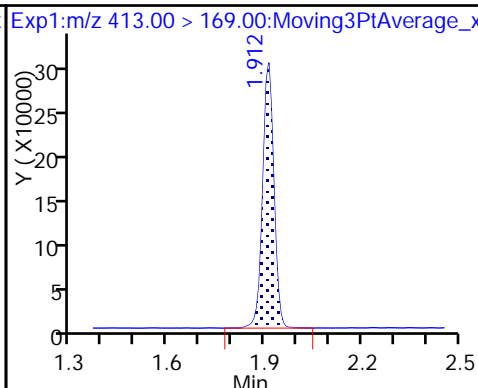
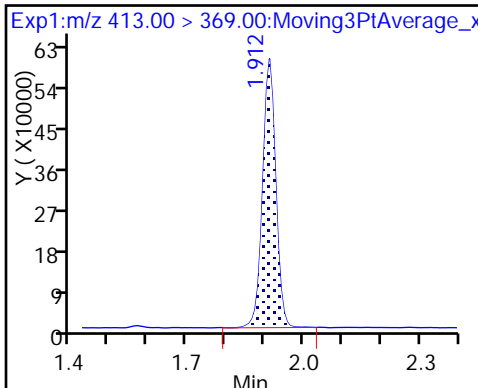
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

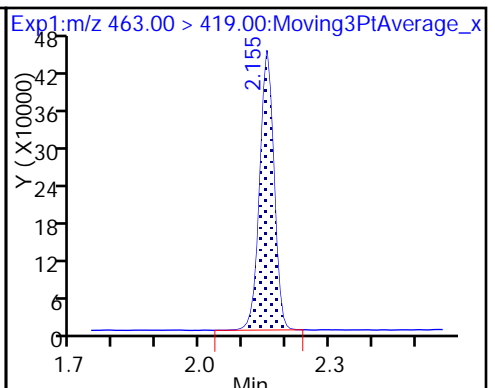
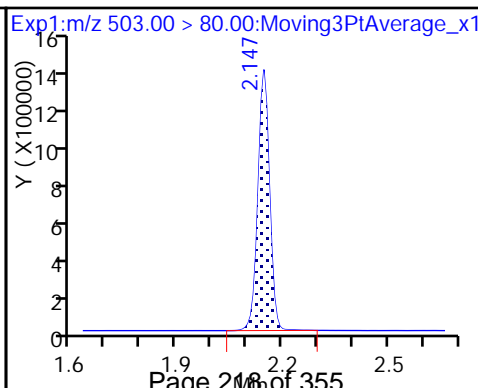
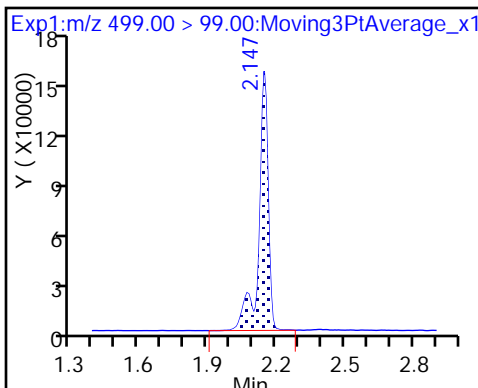
8 Perfluorooctane sulfonic acid



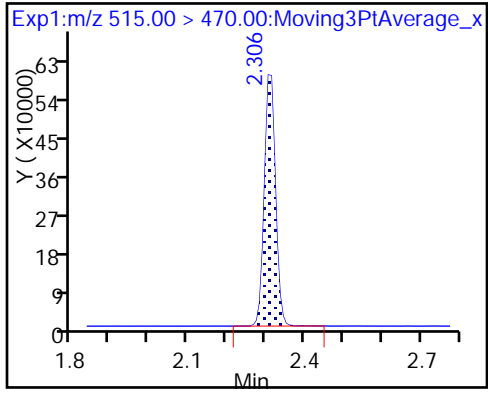
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



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									
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

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537ICAL_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

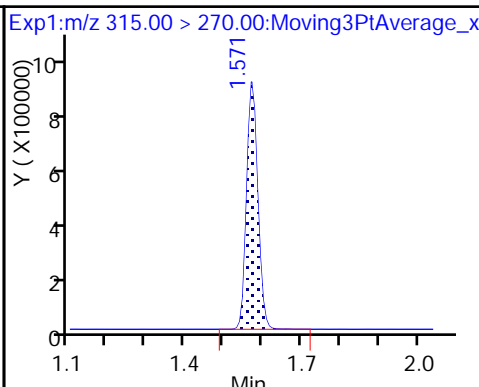
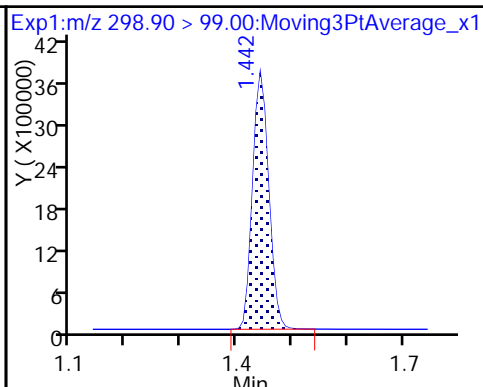
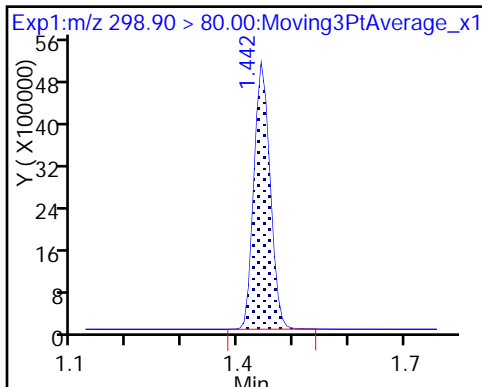
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

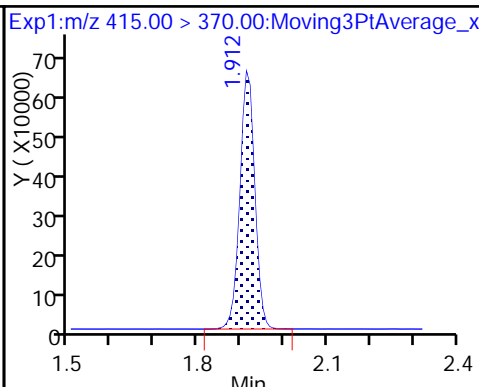
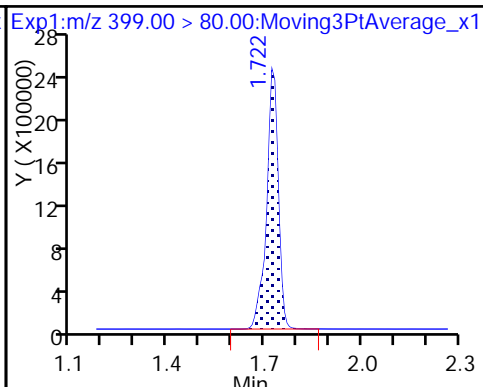
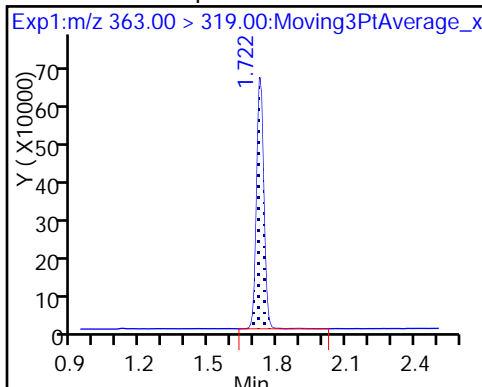
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

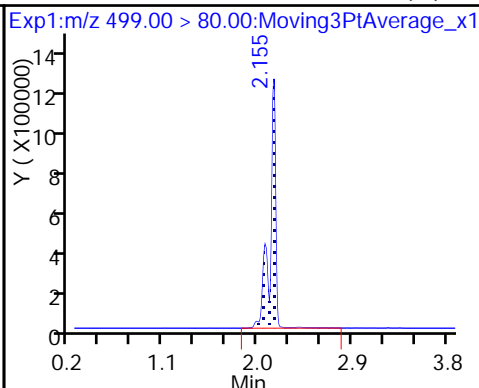
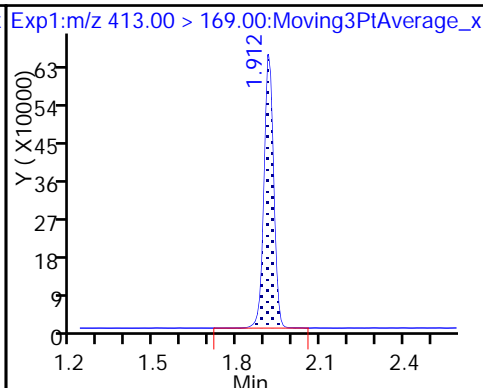
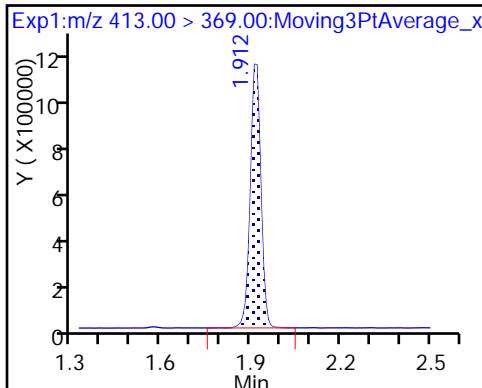
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

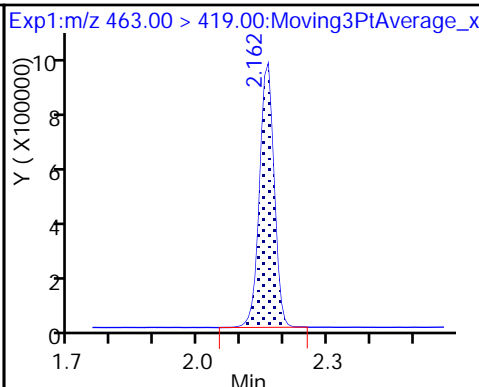
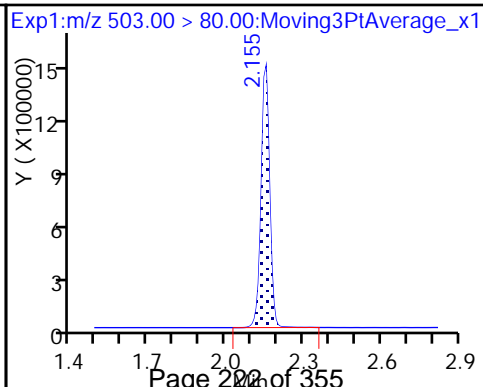
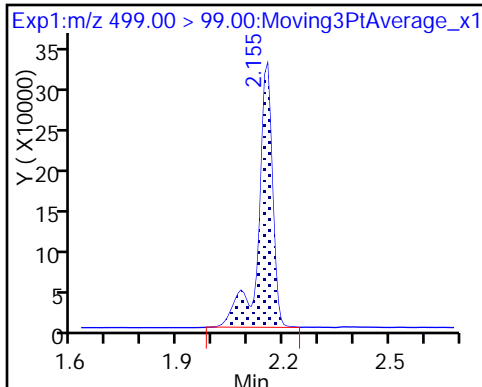
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



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"NAWC-120417-FRB-071","537","RES","320-33890-10","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.6","DL","","TRG","","","31","LOQ","YES","-99","","245.4","1.00","12",""
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(PFOS)","16","ng/L","U M","6.8","DL","","TRG","","","40","LOQ","YES",-99","","251.2","1.00","16",""
"WGNA-120417-DUP13","537","RES","320-33890-13","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","3.8","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES",-99","","251.2","1.00","8.0",""
"WGNA-120417-DUP13","537","RES","320-33890-13","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U M","5.5","DL","","TRG","","","30","LOQ","YES",-99","","251.2","1.00","12",""
"WGNA-120417-DUP13","537","RES","320-33890-13","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U M","16","DL","","TRG","","","90","LOQ","YES",-99","","251.2","1.00","36",""
"WGNA-120417-DUP13","537","RES","320-33890-13","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","2.1","ng/L","J M","1.9","DL","","TRG","","","10","LOQ","YES",-99","","251.2","1.00","4.0",""
"WGNA-120417-DUP13","537","RES","320-33890-13","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES",-99","","251.2","1.00","20",""
"WGNA-120417-DUP13","537","RES","320-33890-13","TALSAC","STL00993","13C2
PFHxA","38","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","39.8","","251.2","1.00","0",""
"WGNA-120417-DUP13","537","RES","320-33890-13","TALSAC","STL00996","13C2
PFDA","34","ng/L","","-99","DL","","SURR","86","","-99","LOQ","YES","39.8","","251.2","1.00","0",""
"NAWC-120417-RW-129MS","537","RES","320-33890-1MS","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","47.4","ng/L","M","6.8","DL","","SPK","95","","40","LOQ","YES","40.0","NAWC-120417-RW-
129","250","1.00","16",""
"NAWC-120417-RW-129MS","537","RES","320-33890-1MS","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","25.5","ng/L","","2.8","DL","","SPK","95","","20","LOQ","YES","20.0","NAWC-120417-RW-
129","250","1.00","8.0",""
"NAWC-120417-RW-129MS","537","RES","320-33890-1MS","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","37.5","ng/L","","5.5","DL","","SPK","125","","30","LOQ","YES","30.0","NAWC-120417-RW-
129","250","1.00","12",""
"NAWC-120417-RW-129MS","537","RES","320-33890-1MS","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","113","ng/L","","16","DL","","SPK","125","","90","LOQ","YES","90.0","NAWC-120417-RW-
129","250","1.00","36",""
"NAWC-120417-RW-129MS","537","RES","320-33890-1MS","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","12.3","ng/L","","1.9","DL","","SPK","103","","10","LOQ","YES","10.0","NAWC-120417-RW-
129","250","1.00","4.0",""
"NAWC-120417-RW-129MS","537","RES","320-33890-1MS","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20.2","ng/L","J","8.0","DL","","SPK","101","","24","LOQ","YES","20.0","NAWC-120417-RW-
129","250","1.00","20",""
"NAWC-120417-RW-129MS","537","RES","320-33890-1MS","TALSAC","STL00993","13C2
PFHxA","40.3","ng/L","","-99","DL","","SURR","101","","-99","LOQ","YES","40.0","NAWC-120417-RW-
129","250","1.00","0",""
"NAWC-120417-RW-129MS","537","RES","320-33890-1MS","TALSAC","STL00996","13C2
PFDA","36.9","ng/L","","-99","DL","","SURR","92","","-99","LOQ","YES","40.0","NAWC-120417-RW-
129","250","1.00","0",""
"NAWC-120417-RW-129MSD","537","RES","320-33890-1MSD","TALSAC","1763-23-1","Perfluorooctanesulfonic
acid (PFOS)","50.1","ng/L","M","6.8","DL","","SPK","101","6","40","LOQ","YES","40.3","NAWC-120417-RW-
129","248.2","1.00","16",""

"NAWC-120417-RW-129MSD", "537", "RES", "320-33890-1MSD", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "26.0", "ng/L", "", "2.8", "DL", "", "SPK", "97", "2", "20", "LOQ", "YES", "20.2", "NAWC-120417-RW-129", "248.2", "1.00", "8.1", ""

"NAWC-120417-RW-129MSD", "537", "RES", "320-33890-1MSD", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "38.7", "ng/L", "", "5.5", "DL", "", "SPK", "128", "3", "30", "LOQ", "YES", "30.2", "NAWC-120417-RW-129", "248.2", "1.00", "12", ""

"NAWC-120417-RW-129MSD", "537", "RES", "320-33890-1MSD", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "102", "ng/L", "", "16", "DL", "", "SPK", "113", "10", "91", "LOQ", "YES", "90.7", "NAWC-120417-RW-129", "248.2", "1.00", "36", ""

"NAWC-120417-RW-129MSD", "537", "RES", "320-33890-1MSD", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "13.5", "ng/L", "", "1.9", "DL", "", "SPK", "114", "10", "10", "LOQ", "YES", "10.1", "NAWC-120417-RW-129", "248.2", "1.00", "4.0", ""

"NAWC-120417-RW-129MSD", "537", "RES", "320-33890-1MSD", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "21.4", "ng/L", "J", "8.1", "DL", "", "SPK", "106", "6", "24", "LOQ", "YES", "20.1", "NAWC-120417-RW-129", "248.2", "1.00", "20", ""

"NAWC-120417-RW-129MSD", "537", "RES", "320-33890-1MSD", "TALSAC", "STL00993", "13C2 PFHxA", "38.5", "ng/L", "", "-99", "DL", "", "SURR", "95", "", "-99", "LOQ", "YES", "40.3", "NAWC-120417-RW-129", "248.2", "1.00", "0", ""

"NAWC-120417-RW-129MSD", "537", "RES", "320-33890-1MSD", "TALSAC", "STL00996", "13C2 PFDA", "38.2", "ng/L", "", "-99", "DL", "", "SURR", "95", "", "-99", "LOQ", "YES", "40.3", "NAWC-120417-RW-129", "248.2", "1.00", "0", ""

"NAWC-120417-FRB-129", "537", "RES", "320-33890-2", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "16", "ng/L", "U", "6.9", "DL", "", "TRG", "", "", "40", "LOQ", "YES", "-99", "", "247.1", "1.00", "16", ""

"NAWC-120417-FRB-129", "537", "RES", "320-33890-2", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "8.1", "ng/L", "U", "2.8", "DL", "", "TRG", "", "", "20", "LOQ", "YES", "-99", "", "247.1", "1.00", "8.1", ""

"NAWC-120417-FRB-129", "537", "RES", "320-33890-2", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "12", "ng/L", "U", "5.6", "DL", "", "TRG", "", "", "30", "LOQ", "YES", "-99", "", "247.1", "1.00", "12", ""

"NAWC-120417-FRB-129", "537", "RES", "320-33890-2", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "36", "ng/L", "U", "16", "DL", "", "TRG", "", "", "91", "LOQ", "YES", "-99", "", "247.1", "1.00", "36", ""

"NAWC-120417-FRB-129", "537", "RES", "320-33890-2", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "4.0", "ng/L", "U", "1.9", "DL", "", "TRG", "", "", "10", "LOQ", "YES", "-99", "", "247.1", "1.00", "4.0", ""

"NAWC-120417-FRB-129", "537", "RES", "320-33890-2", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "20", "ng/L", "U", "8.1", "DL", "", "TRG", "", "", "24", "LOQ", "YES", "-99", "", "247.1", "1.00", "20", ""

"NAWC-120417-FRB-129", "537", "RES", "320-33890-2", "TALSAC", "STL00993", "13C2 PFHxA", "39", "ng/L", "", "-99", "DL", "", "SURR", "95", "", "-99", "LOQ", "YES", "40.5", "", "247.1", "1.00", "0", ""

"NAWC-120417-FRB-129", "537", "RES", "320-33890-2", "TALSAC", "STL00996", "13C2 PFDA", "38", "ng/L", "", "-99", "DL", "", "SURR", "93", "", "-99", "LOQ", "YES", "40.5", "", "247.1", "1.00", "0", ""

"NAWC-120417-RW-055", "537", "RES", "320-33890-3", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "16", "ng/L", "U", "6.8", "DL", "", "TRG", "", "", "40", "LOQ", "YES", "-99", "", "249.4", "1.00", "16", ""

"NAWC-120417-RW-055", "537", "RES", "320-33890-3", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "3.8", "ng/L", "J", "2.8", "DL", "", "TRG", "", "", "20", "LOQ", "YES", "-99", "", "249.4", "1.00", "8.0", ""

"NAWC-120417-RW-055", "537", "RES", "320-33890-3", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "12", "ng/L", "U", "5.5", "DL", "", "TRG", "", "", "30", "LOQ", "YES", "-99", "", "249.4", "1.00", "12", ""

"NAWC-120417-RW-055", "537", "RES", "320-33890-3", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "36", "ng/L", "U", "16", "DL", "", "TRG", "", "", "90", "LOQ", "YES", "-99", "", "249.4", "1.00", "36", ""

"NAWC-120417-RW-055", "537", "RES", "320-33890-3", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "4.0", "ng/L", "U", "1.9", "DL", "", "TRG", "", "", "10", "LOQ", "YES", "-99", "", "249.4", "1.00", "4.0", ""

"NAWC-120417-RW-055", "537", "RES", "320-33890-3", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "20", "ng/L", "U", "8.0", "DL", "", "TRG", "", "", "24", "LOQ", "YES", "-99", "", "249.4", "1.00", "20", ""

"NAWC-120417-RW-055", "537", "RES", "320-33890-3", "TALSAC", "STL00993", "13C2 PFHxA", "40", "ng/L", "", "-99", "DL", "", "SURR", "100", "", "-99", "LOQ", "YES", "40.1", "", "249.4", "1.00", "0", ""

"NAWC-120417-RW-055", "537", "RES", "320-33890-3", "TALSAC", "STL00996", "13C2 PFDA", "39", "ng/L", "", "-99", "DL", "", "SURR", "96", "", "-99", "LOQ", "YES", "40.1", "", "249.4", "1.00", "0", ""

"NAWC-120417-FRB-055", "537", "RES", "320-33890-4", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid

(PFOS),"16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250.2","1.00","16",""
"NAWC-120417-FRB-055","537","RES","320-33890-4","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250.2","1.00","8.0",""
"NAWC-120417-FRB-055","537","RES","320-33890-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250.2","1.00","12",""
"NAWC-120417-FRB-055","537","RES","320-33890-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250.2","1.00","36",""
"NAWC-120417-FRB-055","537","RES","320-33890-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250.2","1.00","4.0",""
"NAWC-120417-FRB-055","537","RES","320-33890-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250.2","1.00","20",""
"NAWC-120417-FRB-055","537","RES","320-33890-4","TALSAC","STL00993","13C2
PFHxA","38","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","40.0","","250.2","1.00","0",""
"NAWC-120417-FRB-055","537","RES","320-33890-4","TALSAC","STL00996","13C2
PFDA","38","ng/L","","-99","DL","","SURR","95","","-99","LOQ","YES","40.0","","250.2","1.00","0",""
"NAWC-120417-RW-028","537","RES","320-33890-5","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"19","ng/L","J M","6.8","DL","","TRG","","","40","LOQ","YES","-99","","249.7","1.00","16",""
"NAWC-120417-RW-028","537","RES","320-33890-5","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"15","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","249.7","1.00","8.0",""
"NAWC-120417-RW-028","537","RES","320-33890-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"7.6","ng/L","J","5.5","DL","","TRG","","","30","LOQ","YES","-99","","249.7","1.00","12",""
"NAWC-120417-RW-028","537","RES","320-33890-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","249.7","1.00","36",""
"NAWC-120417-RW-028","537","RES","320-33890-5","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"4.5","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","249.7","1.00","4.0",""
"NAWC-120417-RW-028","537","RES","320-33890-5","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"20","ng/L","U M","8.0","DL","","TRG","","","24","LOQ","YES","-99","","249.7","1.00","20",""
"NAWC-120417-RW-028","537","RES","320-33890-5","TALSAC","STL00993","13C2
PFHxA","37","ng/L","","-99","DL","","SURR","91","","-99","LOQ","YES","40.0","","249.7","1.00","0",""
"NAWC-120417-RW-028","537","RES","320-33890-5","TALSAC","STL00996","13C2
PFDA","39","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","40.0","","249.7","1.00","0",""
"NAWC-120417-FRB-028","537","RES","320-33890-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","248.2","1.00","16",""
"NAWC-120417-FRB-028","537","RES","320-33890-6","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"8.1","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","248.2","1.00","8.1",""
"NAWC-120417-FRB-028","537","RES","320-33890-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","248.2","1.00","12",""
"NAWC-120417-FRB-028","537","RES","320-33890-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"36","ng/L","U","16","DL","","TRG","","","91","LOQ","YES","-99","","248.2","1.00","36",""
"NAWC-120417-FRB-028","537","RES","320-33890-6","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","248.2","1.00","4.0",""
"NAWC-120417-FRB-028","537","RES","320-33890-6","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"20","ng/L","U","8.1","DL","","TRG","","","24","LOQ","YES","-99","","248.2","1.00","20",""
"NAWC-120417-FRB-028","537","RES","320-33890-6","TALSAC","STL00993","13C2
PFHxA","39","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","40.3","","248.2","1.00","0",""
"NAWC-120417-FRB-028","537","RES","320-33890-6","TALSAC","STL00996","13C2
PFDA","38","ng/L","","-99","DL","","SURR","95","","-99","LOQ","YES","40.3","","248.2","1.00","0",""
"NAWC-120417-RW-118","537","RES","320-33890-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"19","ng/L","J","6.9","DL","","TRG","","","40","LOQ","YES","-99","","248.1","1.00","16",""
"NAWC-120417-RW-118","537","RES","320-33890-7","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"16","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","248.1","1.00","8.1",""
"NAWC-120417-RW-118","537","RES","320-33890-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"10","ng/L","J","5.5","DL","","TRG","","","30","LOQ","YES","-99","","248.1","1.00","12",""
"NAWC-120417-RW-118","537","RES","320-33890-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid

(PFBS)", "36", "ng/L", "U", "16", "DL", "", "TRG", "", "", "91", "LOQ", "YES", "-99", "", "248.1", "1.00", "36", ""
"NAWC-120417-RW-118", "537", "RES", "320-33890-7", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)", "5.0", "ng/L", "J", "1.9", "DL", "", "TRG", "", "", "10", "LOQ", "YES", "-99", "", "248.1", "1.00", "4.0", ""
"NAWC-120417-RW-118", "537", "RES", "320-33890-7", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)", "20", "ng/L", "U M", "8.1", "DL", "", "TRG", "", "", "24", "LOQ", "YES", "-99", "", "248.1", "1.00", "20", ""
"NAWC-120417-RW-118", "537", "RES", "320-33890-7", "TALSAC", "STL00993", "13C2
PFHxA", "39", "ng/L", "", "-99", "DL", "", "SURR", "97", "", "-99", "LOQ", "YES", "40.3", "", "248.1", "1.00", "0", ""
"NAWC-120417-RW-118", "537", "RES", "320-33890-7", "TALSAC", "STL00996", "13C2
PFDA", "38", "ng/L", "", "-99", "DL", "", "SURR", "95", "", "-99", "LOQ", "YES", "40.3", "", "248.1", "1.00", "0", ""
"NAWC-120417-FRB-118", "537", "RES", "320-33890-8", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
(PFOS)", "16", "ng/L", "U", "6.9", "DL", "", "TRG", "", "", "41", "LOQ", "YES", "-99", "", "246", "1.00", "16", ""
"NAWC-120417-FRB-118", "537", "RES", "320-33890-8", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)", "8.1", "ng/L", "U", "2.8", "DL", "", "TRG", "", "", "20", "LOQ", "YES", "-99", "", "246", "1.00", "8.1", ""
"NAWC-120417-FRB-118", "537", "RES", "320-33890-8", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid
(PFHxS)", "12", "ng/L", "U", "5.6", "DL", "", "TRG", "", "", "30", "LOQ", "YES", "-99", "", "246", "1.00", "12", ""
"NAWC-120417-FRB-118", "537", "RES", "320-33890-8", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)", "37", "ng/L", "U", "16", "DL", "", "TRG", "", "", "91", "LOQ", "YES", "-99", "", "246", "1.00", "37", ""
"NAWC-120417-FRB-118", "537", "RES", "320-33890-8", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)", "4.1", "ng/L", "U", "1.9", "DL", "", "TRG", "", "", "10", "LOQ", "YES", "-99", "", "246", "1.00", "4.1", ""
"NAWC-120417-FRB-118", "537", "RES", "320-33890-8", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)", "20", "ng/L", "U", "8.1", "DL", "", "TRG", "", "", "24", "LOQ", "YES", "-99", "", "246", "1.00", "20", ""
"NAWC-120417-FRB-118", "537", "RES", "320-33890-8", "TALSAC", "STL00993", "13C2
PFHxA", "38", "ng/L", "", "-99", "DL", "", "SURR", "93", "", "-99", "LOQ", "YES", "40.7", "", "246", "1.00", "0", ""
"NAWC-120417-FRB-118", "537", "RES", "320-33890-8", "TALSAC", "STL00996", "13C2
PFDA", "38", "ng/L", "", "-99", "DL", "", "SURR", "94", "", "-99", "LOQ", "YES", "40.7", "", "246", "1.00", "0", ""
"NAWC-120417-RW-071", "537", "RES", "320-33890-9", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
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TO: A. FREBOWITZ **DATE:** JANUARY 11, 2018
FROM: TERRI L. SOLOMON **COPIES:** DV FILE
SUBJECT: ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)
NAS JRB WILLOW GROVE
SAMPLE DELIVERY GROUP (SDG) 320-33890-1

SAMPLES: 6/Field Reagent Blank (FRB)
NAWC-120417-FRB-028 NAWC-120417-FRB-055
NAWC-120417-FRB-071 NAWC-120417-FRB-075
NAWC-120417-FRB-118 NAWC-120417-FRB-129

7/Drinking Water
NAWC-120417-RW-028 NAWC-120417-RW-055
NAWC-120417-RW-071 NAWC-120417-RW-075
NAWC-120417-RW-118 NAWC-120417-RW-129
WGNA-120417-DUP13

Overview

The sample set for NAS JRB Willow Grove, SDG 320-33890-1, consisted of seven (7) drinking water samples and six (6) 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 (NAWC-120417-RW-055 / WGNA-120417-DUP13) was included in this SDG.

The samples were collected by Tetra Tech on December 4, 2017 and analyzed by Test America-Sacramento. All sample analyses were conducted in accordance with EPA Method 537 version 1.1 analytical and reporting protocols.

The data contained in this SDG was validated with regard to the following parameters: data completeness, holding times, initial/continuing calibrations, laboratory method/FRBs, surrogate spike recoveries, laboratory control sample results, matrix spike / matrix spike duplicate recoveries, 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).

TO: A. FREBOWITZ
SDG: 320-33890-1

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Notes

Samples with detections and their associated FRBs are summarized below. No detected results were present in the FRBs.

<u>Sample</u>	<u>Associated FRB</u>
NAWC-120417-RW-028	NAWC-120417-FRB-028
NAWC-120417-RW-055	NAWC-120417-FRB-055
NAWC-120417-RW-071	NAWC-120417-FRB-071
NAWC-120417-RW-075	NAWC-120417-FRB-075
NAWC-120417-RW-118	NAWC-120417-FRB-118
NAWC-120417-RW-129	NAWC-120417-FRB-129
WGNA-120417-DUP13	NAWC-120417-FRB-055

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 ($< 2 \times$ 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 SDG: 320-33890-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	NAWC-120417-FRB-028			NAWC-120417-FRB-055			NAWC-120417-FRB-071			NAWC-120417-FRB-075		
	LAB_ID	320-33890-6			320-33890-4			320-33890-10			320-33890-12		
	SAMP_DATE	12/4/2017			12/4/2017			12/4/2017			12/4/2017		
	QC_TYPE	FB			FB			FB			FB		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID	8.1	U		8	U		8.1	U		8	U		
PERFLUOROBUTANESULFONIC ACID	36	U		36	U		37	U		36	U		
PERFLUOROHEPTANOIC ACID	4	U		4	U		4.1	U		4	U		
PERFLUOROHXANESULFONIC 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 SDG: 320-33890-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	NAWC-120417-FRB-118			NAWC-120417-FRB-129			NAWC-120417-RW-028			NAWC-120417-RW-055		
	LAB_ID	320-33890-8			320-33890-2			320-33890-5			320-33890-3		
	SAMP_DATE	12/4/2017			12/4/2017			12/4/2017			12/4/2017		
	QC_TYPE	FB			FB			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID	8.1	U		8.1	U		15	J	P	3.8	J	P	
PERFLUOROBUTANESULFONIC ACID	37	U		36	U		36	U		36	U		
PERFLUOROHEPTANOIC ACID	4.1	U		4	U		4.5	J	P	4	U		
PERFLUOROHXANESULFONIC ACID	12	U		12	U		7.6	J	P	12	U		
PERFLUORONONANOIC ACID	20	U		20	U		20	U		20	U		
PERFLUOROOCTANE SULFONIC ACID	16	U		16	U		19	J	P	16	U		

PROJ_NO: 08005-WE04 SDG: 320-33890-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	NAWC-120417-RW-071			NAWC-120417-RW-075			NAWC-120417-RW-118			NAWC-120417-RW-129		
	LAB_ID	320-33890-9			320-33890-11			320-33890-7			320-33890-1		
	SAMP_DATE	12/4/2017			12/4/2017			12/4/2017			12/4/2017		
	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	6.9	J	P	8.1	U		16	J	P	6.5	J	P	
PERFLUOROBUTANESULFONIC ACID	36	U		36	U		36	U		36	U		
PERFLUOROHEPTANOIC ACID	2.9	J	P	4	U		5	J	P	2	J	P	
PERFLUOROHXANESULFONIC ACID	12	U		12	U		10	J	P	12	U		
PERFLUORONONANOIC ACID	20	U		20	U		20	U		20	U		
PERFLUOROOCTANE SULFONIC ACID	16	U		16	U		19	J	P	9.2	J	P	

PROJ_NO: 08005-WE04 SDG: 320-33890-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	WGNA-120417-DUP13		
	LAB_ID	320-33890-13		
	SAMP_DATE	12/4/2017		
	QC_TYPE	FD		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF	NAWC-120417-RW-055		
PARAMETER	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID	3.8	J	P	
PERFLUOROBUTANESULFONIC ACID	36	U		
PERFLUOROHEPTANOIC ACID	2.1	J	P	
PERFLUOROHEXANESULFONIC ACID	12	U		
PERFLUORONONANOIC ACID	20	U		
PERFLUOROOCTANE SULFONIC ACID	16	U		

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-129 Lab Sample ID: 320-33890-1
 Matrix: Water Lab File ID: 2017.12.08_537AA_006.d
 Analysis Method: 537 Date Collected: 12/04/2017 10:10
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 247.6(mL) Date Analyzed: 12/08/2017 12:58
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199060 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.2	J M	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	6.5	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)	2.0	J M	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	98		70-130
STL00996	13C2 PFDA	97		70-130

Steven L. Selman
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-129 Lab Sample ID: 320-33890-2
 Matrix: Water Lab File ID: 2017.12.08_537AA_016.d
 Analysis Method: 537 Date Collected: 12/04/2017 10:05
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 247.1(mL) Date Analyzed: 12/08/2017 13:46
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	93		70-130

Wesley L. Selman
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-055 Lab Sample ID: 320-33890-3
 Matrix: Water Lab File ID: 2017.12.08_537AA_017.d
 Analysis Method: 537 Date Collected: 12/04/2017 10:40
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 249.4 (mL) Date Analyzed: 12/08/2017 13:51
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 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)	3.8	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)	4.0	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	96		70-130

Wesley L. Selman
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-055 Lab Sample ID: 320-33890-4
 Matrix: Water Lab File ID: 2017.12.08_537AA_018.d
 Analysis Method: 537 Date Collected: 12/04/2017 10:35
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 250.2 (mL) Date Analyzed: 12/08/2017 13:55
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 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	96		70-130
STL00996	13C2 PFDA	95		70-130

Ami L. Salaman
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-028 Lab Sample ID: 320-33890-5
 Matrix: Water Lab File ID: 2017.12.08_537AA_019.d
 Analysis Method: 537 Date Collected: 12/04/2017 11:10
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 249.7(mL) Date Analyzed: 12/08/2017 14:00
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	15	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)	7.6	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5	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	91		70-130
STL00996	13C2 PFDA	96		70-130

Wesley L. Selman
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-028 Lab Sample ID: 320-33890-6
 Matrix: Water Lab File ID: 2017.12.08_537AA_020.d
 Analysis Method: 537 Date Collected: 12/04/2017 11:05
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 248.2 (mL) Date Analyzed: 12/08/2017 14:05
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 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)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	95		70-130

Steve L. Salzman
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-118 Lab Sample ID: 320-33890-7
 Matrix: Water Lab File ID: 2017.12.08_537AA_021.d
 Analysis Method: 537 Date Collected: 12/04/2017 11:40
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 248.1(mL) Date Analyzed: 12/08/2017 14:10
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	16	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)	10	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.0	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	97		70-130
STL00996	13C2 PFDA	95		70-130

Wesley L. Salzman

01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-118 Lab Sample ID: 320-33890-8
 Matrix: Water Lab File ID: 2017.12.08_537AA_022.d
 Analysis Method: 537 Date Collected: 12/04/2017 11:35
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 246(mL) Date Analyzed: 12/08/2017 14:14
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	94		70-130

Steve L. Salomon
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-071 Lab Sample ID: 320-33890-9
 Matrix: Water Lab File ID: 2017.12.08_537AA_023.d
 Analysis Method: 537 Date Collected: 12/04/2017 12:10
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 251.8 (mL) Date Analyzed: 12/08/2017 14:19
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 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)	6.9	J	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 M	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.9	J M	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	95		70-130
STL00996	13C2 PFDA	96		70-130

Steve L. Selman
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-071 Lab Sample ID: 320-33890-10
 Matrix: Water Lab File ID: 2017.12.08_537AA_024.d
 Analysis Method: 537 Date Collected: 12/04/2017 12:05
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 245.4 (mL) Date Analyzed: 12/08/2017 14:24
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.9
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	92		70-130

Ali L. Selman
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-075 Lab Sample ID: 320-33890-11
 Matrix: Water Lab File ID: 2017.12.08_537AA_025.d
 Analysis Method: 537 Date Collected: 12/04/2017 12:40
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 247.2 (mL) Date Analyzed: 12/08/2017 14:28
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	92		70-130

Steve L. Salaman
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-075 Lab Sample ID: 320-33890-12
 Matrix: Water Lab File ID: 2017.12.08_537AA_028.d
 Analysis Method: 537 Date Collected: 12/04/2017 12:35
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 248.6(mL) Date Analyzed: 12/08/2017 14:42
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199066 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	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	91		70-130

Wesley L. Salzman
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: WGNA-120417-DUP13 Lab Sample ID: 320-33890-13
 Matrix: Water Lab File ID: 2017.12.08_537AA_029.d
 Analysis Method: 537 Date Collected: 12/04/2017 07:00
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 251.2 (mL) Date Analyzed: 12/08/2017 14:47
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199066 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	3.8	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 M	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.1	J M	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U M	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	86		70-130

Wesley L. Selman
01/11/2018

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-129 Lab Sample ID: 320-33890-1
 Matrix: Water Lab File ID: 2017.12.08_537AA_006.d
 Analysis Method: 537 Date Collected: 12/04/2017 10:10
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 247.6(mL) Date Analyzed: 12/08/2017 12:58
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199060 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.2	J M	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	6.5	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)	2.0	J M	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	98		70-130
STL00996	13C2 PFDA	97		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-129 Lab Sample ID: 320-33890-2
 Matrix: Water Lab File ID: 2017.12.08_537AA_016.d
 Analysis Method: 537 Date Collected: 12/04/2017 10:05
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 247.1(mL) Date Analyzed: 12/08/2017 13:46
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	93		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-055 Lab Sample ID: 320-33890-3
 Matrix: Water Lab File ID: 2017.12.08_537AA_017.d
 Analysis Method: 537 Date Collected: 12/04/2017 10:40
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 249.4 (mL) Date Analyzed: 12/08/2017 13:51
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 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)	3.8	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)	4.0	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	96		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-055 Lab Sample ID: 320-33890-4
 Matrix: Water Lab File ID: 2017.12.08_537AA_018.d
 Analysis Method: 537 Date Collected: 12/04/2017 10:35
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 250.2 (mL) Date Analyzed: 12/08/2017 13:55
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 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	96		70-130
STL00996	13C2 PFDA	95		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-028 Lab Sample ID: 320-33890-5
 Matrix: Water Lab File ID: 2017.12.08_537AA_019.d
 Analysis Method: 537 Date Collected: 12/04/2017 11:10
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 249.7(mL) Date Analyzed: 12/08/2017 14:00
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	15	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)	7.6	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5	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	91		70-130
STL00996	13C2 PFDA	96		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-028 Lab Sample ID: 320-33890-6
 Matrix: Water Lab File ID: 2017.12.08_537AA_020.d
 Analysis Method: 537 Date Collected: 12/04/2017 11:05
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 248.2 (mL) Date Analyzed: 12/08/2017 14:05
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 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)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	95		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-118 Lab Sample ID: 320-33890-7
 Matrix: Water Lab File ID: 2017.12.08_537AA_021.d
 Analysis Method: 537 Date Collected: 12/04/2017 11:40
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 248.1(mL) Date Analyzed: 12/08/2017 14:10
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	16	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)	10	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.0	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	97		70-130
STL00996	13C2 PFDA	95		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-118 Lab Sample ID: 320-33890-8
 Matrix: Water Lab File ID: 2017.12.08_537AA_022.d
 Analysis Method: 537 Date Collected: 12/04/2017 11:35
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 246(mL) Date Analyzed: 12/08/2017 14:14
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	94		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-071 Lab Sample ID: 320-33890-9
 Matrix: Water Lab File ID: 2017.12.08_537AA_023.d
 Analysis Method: 537 Date Collected: 12/04/2017 12:10
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 251.8 (mL) Date Analyzed: 12/08/2017 14:19
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 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)	6.9	J	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 M	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.9	J M	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	95		70-130
STL00996	13C2 PFDA	96		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-071 Lab Sample ID: 320-33890-10
 Matrix: Water Lab File ID: 2017.12.08_537AA_024.d
 Analysis Method: 537 Date Collected: 12/04/2017 12:05
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 245.4 (mL) Date Analyzed: 12/08/2017 14:24
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.9
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	92		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-RW-075 Lab Sample ID: 320-33890-11
 Matrix: Water Lab File ID: 2017.12.08_537AA_025.d
 Analysis Method: 537 Date Collected: 12/04/2017 12:40
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 247.2 (mL) Date Analyzed: 12/08/2017 14:28
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199064 Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	92		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: NAWC-120417-FRB-075 Lab Sample ID: 320-33890-12
 Matrix: Water Lab File ID: 2017.12.08_537AA_028.d
 Analysis Method: 537 Date Collected: 12/04/2017 12:35
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 248.6(mL) Date Analyzed: 12/08/2017 14:42
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199066 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	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	91		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: WGNA-120417-DUP13 Lab Sample ID: 320-33890-13
 Matrix: Water Lab File ID: 2017.12.08_537AA_029.d
 Analysis Method: 537 Date Collected: 12/04/2017 07:00
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 251.2 (mL) Date Analyzed: 12/08/2017 14:47
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199066 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	3.8	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 M	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.1	J M	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U M	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	86		70-130

Appendix C

Support Documentation

ANALYTE	ORIGINAL	DUPLICATE	RL	RPD	RPD > 50%	ORIGINAL	DUPLICATE	DIFFERENCE >2XRL
	RW-055	DUP13				SAMPLE CONC >2xRL	SAMPLE CONC >2xRL	
Perfluorooctanoic acid (PFOA)	3.8	3.8	20	0.000	FALSE	FALSE	FALSE	FALSE
Perfluoroheptanoic acid (PFHpA)	4	2.1	10	62.295	TRUE	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 Laboratories, Inc.

Regulatory Program: DW NPDES RCRA Other:

Client Contact		Project Manager: Andy Frebowitz		Site Contact: Mary Kay Bond		Date: 12/4/2017		COC No.:	
TetraTech 234 Mail Boulevard Suite 260 King of Prussia, PA 19406 610-382-1174 610-491-9688 Project Name: WE04 Site: WE04 P O # 1132358 (through EarthToxics)		Tel/Fax: 610.382.1170		Lab Contact: Dave Alltucker		Carrier: FedEx		1 of 1 COCs	
		Analysis Turnaround Time		Filtered Sample (Y/N) Perform MS / MSD (Y/N) EPA 537 UCMR3				Sampler: Mary Kay Bond	
		<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below 21 <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day						For Lab Use Only: Walk-in Client: Lab Sampling:	
								Job / SDG No.:	
								Sample Specific Notes: Field Reagent Blank Field Reagent Blank Field Reagent Blank Field Reagent Blank Field Reagent Blank Field Reagent Blank Field Reagent Blank Duplicate	
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	
NAWC-120417-RW-129	12/4/2017	10:10	G	DW	6	N	Y		
NAWC-120417-FRB-129	12/4/2017	10:05	G	DW	2	N	Y		
NAWC-120417-RW-055	12/4/2017	10:40	G	DW	2	N	Y		
NAWC-120417-FRB-055	12/4/2017	10:35	G	DW	2	N	Y		
NAWC-120417-RW-028	12/4/2017	11:10	G	DW	2	N	Y		
NAWC-120417-FRB-028	12/4/2017	11:05	G	DW	2	N	Y		
NAWC-120417-RW-118	12/4/2017	11:40	G	DW	2	N	Y		
NAWC-120417-FRB-118	12/4/2017	11:35	G	DW	2	N	Y		
NAWC-120417-RW-071	12/4/2017	12:10	G	DW	2	N	Y		
NAWC-120417-FRB-071	12/4/2017	12:05	G	DW	2	N	Y		
NAWC-120417-RW-075	12/4/2017	12:40	G	DW	2	N	Y		
NAWC-120417-FRB-075	12/4/2017	12:35	G	DW	2	N	Y		
WGNA-120417-DUP13	12/4/2017	7:00	G	DW	2	N	Y		



Page 354 of 355

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

Possible Hazard Identification:
 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the
 Non-Hazard Flammable Skin Irritant Poison B Unknown

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

Fed Ex Tracking: 7708 9669 4335

Custody Seals Intact: Yes No

Custody Seal No.: _____ Cooler Temp. (°C): Obs'd: 27°C Corr'd: _____ Therm ID No.: AK3

Relinquished by: <u>[Signature]</u>	Company: Tetra Tech	Date/Time: 12/4/2017 16:00	Received by: <u>[Signature]</u>	Company: <u>THWS</u>	Date/Time: 12/5/17 1030
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Job Narrative
320-33890-1

Receipt

The samples were received on 12/5/2017 10:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.7° 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

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

Method Summary

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

TestAmerica Job ID: 320-33890-1

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-33890-1

Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-33890-1	NAWC-120417-RW-129	Water	12/04/17 10:10	12/05/17 10:30
320-33890-2	NAWC-120417-FRB-129	Water	12/04/17 10:05	12/05/17 10:30
320-33890-3	NAWC-120417-RW-055	Water	12/04/17 10:40	12/05/17 10:30
320-33890-4	NAWC-120417-FRB-055	Water	12/04/17 10:35	12/05/17 10:30
320-33890-5	NAWC-120417-RW-028	Water	12/04/17 11:10	12/05/17 10:30
320-33890-6	NAWC-120417-FRB-028	Water	12/04/17 11:05	12/05/17 10:30
320-33890-7	NAWC-120417-RW-118	Water	12/04/17 11:40	12/05/17 10:30
320-33890-8	NAWC-120417-FRB-118	Water	12/04/17 11:35	12/05/17 10:30
320-33890-9	NAWC-120417-RW-071	Water	12/04/17 12:10	12/05/17 10:30
320-33890-10	NAWC-120417-FRB-071	Water	12/04/17 12:05	12/05/17 10:30
320-33890-11	NAWC-120417-RW-075	Water	12/04/17 12:40	12/05/17 10:30
320-33890-12	NAWC-120417-FRB-075	Water	12/04/17 12:35	12/05/17 10:30
320-33890-13	WGNA-120417-DUP13	Water	12/04/17 07:00	12/05/17 10:30

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-33890-1

SDG No.: _____

Matrix: Water

Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-120417-RW-129	320-33890-1	98	97
NAWC-120417-FRB-129	320-33890-2	95	93
NAWC-120417-RW-055	320-33890-3	100	96
NAWC-120417-FRB-055	320-33890-4	96	95
NAWC-120417-RW-028	320-33890-5	91	96
NAWC-120417-FRB-028	320-33890-6	97	95
NAWC-120417-RW-118	320-33890-7	97	95
NAWC-120417-FRB-118	320-33890-8	93	94
NAWC-120417-RW-071	320-33890-9	95	96
NAWC-120417-FRB-071	320-33890-10	95	92
NAWC-120417-RW-075	320-33890-11	98	92
NAWC-120417-FRB-075	320-33890-12	102	91
WGNA-120417-DUP13	320-33890-13	96	86
	MB 320-198839/1-A	103	95
	LLCS 320-198839/2-A	100	95
NAWC-120417-RW-129 LMS	320-33890-1 LMS	101	92
NAWC-120417-RW-129 LMSD	320-33890-1 LMSD	95	95

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA

QC LIMITS
70-130
70-130

Column to be used to flag recovery values

FORM III
LCMS LOW LEVEL CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1

SDG No.: _____

Matrix: Water Level: Low Lab File ID: 2017.12.08_537AA_005.d

Lab ID: LLCS 320-198839/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LLCS CONCENTRATION (ng/L)	LLCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	40.0	39.9 J	100	50-150	M
Perfluorooctanoic acid (PFOA)	20.0	20.0	100	50-150	
Perfluorononanoic acid (PFNA)	20.0	20.2 J	101	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.0	34.2	114	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	10.9	109	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.0	109	121	50-150	

Column to be used to flag recovery and RPD values

FORM III
LCMS LOW LEVEL MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.12.08_537AA_007.d
 Lab ID: 320-33890-1 LMS Client ID: NAWC-120417-RW-129 LMS

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	LMS CONCENTRATION (ng/L)	LMS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	40.0	9.2 J	47.4	95	50-150	M
Perfluorooctanoic acid (PFOA)	20.0	6.5 J	25.5	95	50-150	
Perfluorononanoic acid (PFNA)	20.0	20 U	20.2 J	101	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.0	12 U	37.5	125	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	2.0 J	12.3	103	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.0	36 U	113	125	50-150	

Column to be used to flag recovery and RPD values

FORM III
LCMS LOW LEVEL MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.12.08_537AA_008.d
 Lab ID: 320-33890-1 LMSD Client ID: NAWC-120417-RW-129 LMSD

COMPOUND	SPIKE ADDED (ng/L)	LMSD CONCENTRATION (ng/L)	LMSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	40.3	50.1	101	6	50	50-150	M
Perfluorooctanoic acid (PFOA)	20.2	26.0	97	2	50	50-150	
Perfluorononanoic acid (PFNA)	20.1	21.4 J	106	6	50	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.2	38.7	128	3	50	50-150	
Perfluoroheptanoic acid (PFHpA)	10.1	13.5	114	10	50	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.7	102	113	10	50	50-150	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Lab File ID: 2017.12.08_537AA_004.d Lab Sample ID: MB 320-198839/1-A
 Matrix: Water Date Extracted: 12/07/2017 13:23
 Instrument ID: A8_N Date Analyzed: 12/08/2017 12:49
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LLCS 320-198839/2-A	2017.12.08_537AA_005.d	12/08/2017 12:53
NAWC-120417-RW-129	320-33890-1	2017.12.08_537AA_006.d	12/08/2017 12:58
NAWC-120417-RW-129 LMS	320-33890-1 LMS	2017.12.08_537AA_007.d	12/08/2017 13:03
NAWC-120417-RW-129 LMSD	320-33890-1 LMSD	2017.12.08_537AA_008.d	12/08/2017 13:07
NAWC-120417-FRB-129	320-33890-2	2017.12.08_537AA_016.d	12/08/2017 13:46
NAWC-120417-RW-055	320-33890-3	2017.12.08_537AA_017.d	12/08/2017 13:51
NAWC-120417-FRB-055	320-33890-4	2017.12.08_537AA_018.d	12/08/2017 13:55
NAWC-120417-RW-028	320-33890-5	2017.12.08_537AA_019.d	12/08/2017 14:00
NAWC-120417-FRB-028	320-33890-6	2017.12.08_537AA_020.d	12/08/2017 14:05
NAWC-120417-RW-118	320-33890-7	2017.12.08_537AA_021.d	12/08/2017 14:10
NAWC-120417-FRB-118	320-33890-8	2017.12.08_537AA_022.d	12/08/2017 14:14
NAWC-120417-RW-071	320-33890-9	2017.12.08_537AA_023.d	12/08/2017 14:19
NAWC-120417-FRB-071	320-33890-10	2017.12.08_537AA_024.d	12/08/2017 14:24
NAWC-120417-RW-075	320-33890-11	2017.12.08_537AA_025.d	12/08/2017 14:28
NAWC-120417-FRB-075	320-33890-12	2017.12.08_537AA_028.d	12/08/2017 14:42
WGNA-120417-DUP13	320-33890-13	2017.12.08_537AA_029.d	12/08/2017 14:47

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-198839/1-A
 Matrix: Water Lab File ID: 2017.12.08_537AA_004.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 12/07/2017 13:23
 Sample wt/vol: 250.00 (mL) Date Analyzed: 12/08/2017 12:49
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 199060 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	103		70-130
STL00996	13C2 PFDA	95		70-130

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 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 320-199060/1	1406946	1.82	3043781	2.08		
CCV 320-199060/2 CCVIS	1459860	1.82	3121231	2.07		
MB 320-198839/1-A	1369139	1.81	2995818	2.07		
LLCS 320-198839/2-A	1404710	1.81	2981543	2.08		
320-33890-1	NAWC-120417-RW-129	1432616	1.81	3056921	2.07	
320-33890-1 LMS	NAWC-120417-RW-129 LMS	1437857	1.81	3052685	2.07	
320-33890-1 LMSD	NAWC-120417-RW-129 LMSD	1432930	1.81	3065161	2.07	
CCV 320-199060/11 CCVIS		1464431	1.81	3067130	2.06	
CCV 320-199064/4 CCVIS		1377238	1.81	2882251	2.06	
320-33890-2	NAWC-120417-FRB-129	1384062	1.81	2935444	2.07	
320-33890-3	NAWC-120417-RW-055	1419365	1.81	2983138	2.06	
320-33890-4	NAWC-120417-FRB-055	1359265	1.81	2938862	2.07	
320-33890-5	NAWC-120417-RW-028	1445759	1.81	3090514	2.06	
320-33890-6	NAWC-120417-FRB-028	1405251	1.81	2995330	2.07	
320-33890-7	NAWC-120417-RW-118	1393232	1.81	3037244	2.06	
320-33890-8	NAWC-120417-FRB-118	1399280	1.81	2932875	2.06	
320-33890-9	NAWC-120417-RW-071	1272649	1.81	2667570	2.06	
320-33890-10	NAWC-120417-FRB-071	1389736	1.81	2950821	2.06	
320-33890-11	NAWC-120417-RW-075	1421524	1.81	2926970	2.06	
CCV 320-199064/16 CCVIS		1389631	1.81	3085685	2.06	
CCV 320-199066/16 CCVIS		1389631	1.81	3085685	2.06	
320-33890-12	NAWC-120417-FRB-075	1255016	1.81	2594570	2.06	
320-33890-13	WGNA-120417-DUP13	1427376	1.80	2970166	2.06	
CCV 320-199066/20 CCVIS		1386851	1.81	2971857	2.06	

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Sample No.: CCV 320-199060/2 Date Analyzed: 12/08/2017 12:39
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.08_537AA_00 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1459860	1.82	3121231	2.07		
UPPER LIMIT	2043804	2.32	4369723	2.57		
LOWER LIMIT	1021902	1.32	2184862	1.57		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-198839/1-A		1369139	1.81	2995818	2.07	
LLCS 320-198839/2-A		1404710	1.81	2981543	2.08	
320-33890-1	NAWC-120417-RW-129	1432616	1.81	3056921	2.07	
320-33890-1 LMS	NAWC-120417-RW-129 LMS	1437857	1.81	3052685	2.07	
320-33890-1 LMSD	NAWC-120417-RW-129 LMSD	1432930	1.81	3065161	2.07	

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Sample No.: CCV 320-199060/11 Date Analyzed: 12/08/2017 13:21
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.08_537AA_01 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1464431	1.81	3067130	2.06		
UPPER LIMIT	2050203	2.31	4293982	2.56		
LOWER LIMIT	1025102	1.31	2146991	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-198839/1-A		1369139	1.81	2995818	2.07	
LLCS 320-198839/2-A		1404710	1.81	2981543	2.08	
320-33890-1	NAWC-120417-RW-129	1432616	1.81	3056921	2.07	
320-33890-1 LMS	NAWC-120417-RW-129 LMS	1437857	1.81	3052685	2.07	
320-33890-1 LMSD	NAWC-120417-RW-129 LMSD	1432930	1.81	3065161	2.07	

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Sample No.: CCV 320-199064/4 Date Analyzed: 12/08/2017 13:37
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.08_537AA_01 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1377238	1.81	2882251	2.06		
UPPER LIMIT	1928133	2.31	4035151	2.56		
LOWER LIMIT	964067	1.31	2017576	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-33890-2	NAWC-120417-FRB-129	1384062	1.81	2935444	2.07	
320-33890-3	NAWC-120417-RW-055	1419365	1.81	2983138	2.06	
320-33890-4	NAWC-120417-FRB-055	1359265	1.81	2938862	2.07	
320-33890-5	NAWC-120417-RW-028	1445759	1.81	3090514	2.06	
320-33890-6	NAWC-120417-FRB-028	1405251	1.81	2995330	2.07	
320-33890-7	NAWC-120417-RW-118	1393232	1.81	3037244	2.06	
320-33890-8	NAWC-120417-FRB-118	1399280	1.81	2932875	2.06	
320-33890-9	NAWC-120417-RW-071	1272649	1.81	2667570	2.06	
320-33890-10	NAWC-120417-FRB-071	1389736	1.81	2950821	2.06	
320-33890-11	NAWC-120417-RW-075	1421524	1.81	2926970	2.06	

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Sample No.: CCV 320-199064/16 Date Analyzed: 12/08/2017 14:33
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.08_537AA_02 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1389631	1.81	3085685	2.06		
UPPER LIMIT	1945483	2.31	4319959	2.56		
LOWER LIMIT	972742	1.31	2159980	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-33890-2	NAWC-120417-FRB-129	1384062	1.81	2935444	2.07	
320-33890-3	NAWC-120417-RW-055	1419365	1.81	2983138	2.06	
320-33890-4	NAWC-120417-FRB-055	1359265	1.81	2938862	2.07	
320-33890-5	NAWC-120417-RW-028	1445759	1.81	3090514	2.06	
320-33890-6	NAWC-120417-FRB-028	1405251	1.81	2995330	2.07	
320-33890-7	NAWC-120417-RW-118	1393232	1.81	3037244	2.06	
320-33890-8	NAWC-120417-FRB-118	1399280	1.81	2932875	2.06	
320-33890-9	NAWC-120417-RW-071	1272649	1.81	2667570	2.06	
320-33890-10	NAWC-120417-FRB-071	1389736	1.81	2950821	2.06	
320-33890-11	NAWC-120417-RW-075	1421524	1.81	2926970	2.06	

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Sample No.: CCV 320-199066/16 Date Analyzed: 12/08/2017 14:33
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.08_537AA_02 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1389631	1.81	3085685	2.06		
UPPER LIMIT	1945483	2.31	4319959	2.56		
LOWER LIMIT	972742	1.31	2159980	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-33890-12	NAWC-120417-FRB-075	1255016	1.81	2594570	2.06	
320-33890-13	WGNA-120417-DUP13	1427376	1.80	2970166	2.06	

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Sample No.: CCV 320-199066/20 Date Analyzed: 12/08/2017 14:52
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.08_537AA_03 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1386851	1.81	2971857	2.06		
UPPER LIMIT	1941591	2.31	4160600	2.56		
LOWER LIMIT	970796	1.31	2080300	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-33890-12	NAWC-120417-FRB-075	1255016	1.81	2594570	2.06	
320-33890-13	WGNA-120417-DUP13	1427376	1.80	2970166	2.06	

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

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

Column used to flag values outside QC limits

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

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1 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.: 320-33890-1 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)	13PF OA	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)	13PF OA	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)	13PF OA	Ave	201053 4019666	453612	1020851	2106479	3023088	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PF OA	Ave	1655691 1664260	1708988	1701491	1719911	1675220	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	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.: 320-33890-1 Analy Batch No.: 192908

SDG No.: _____

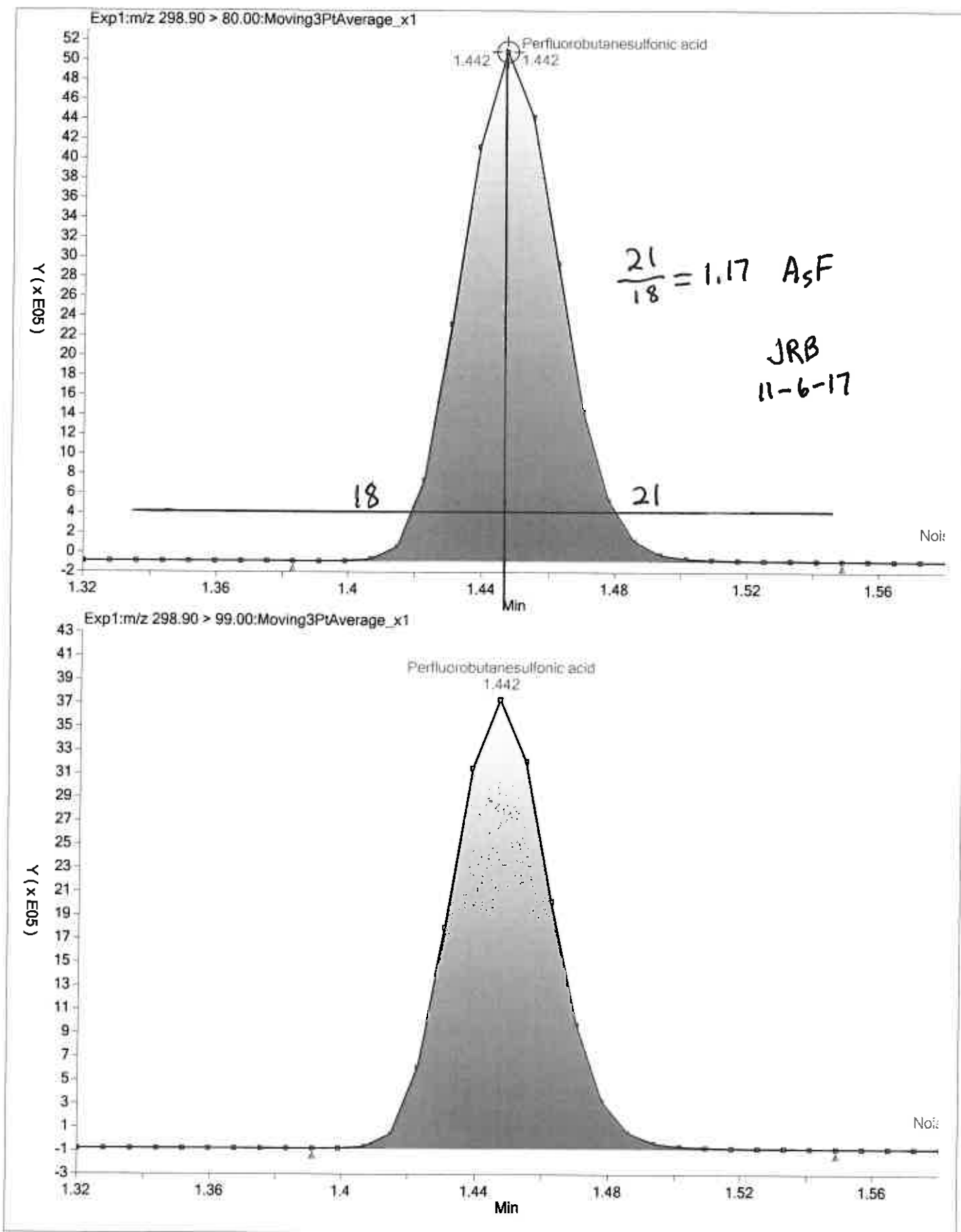
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3 (mm) Heated Purge: (Y/N) N

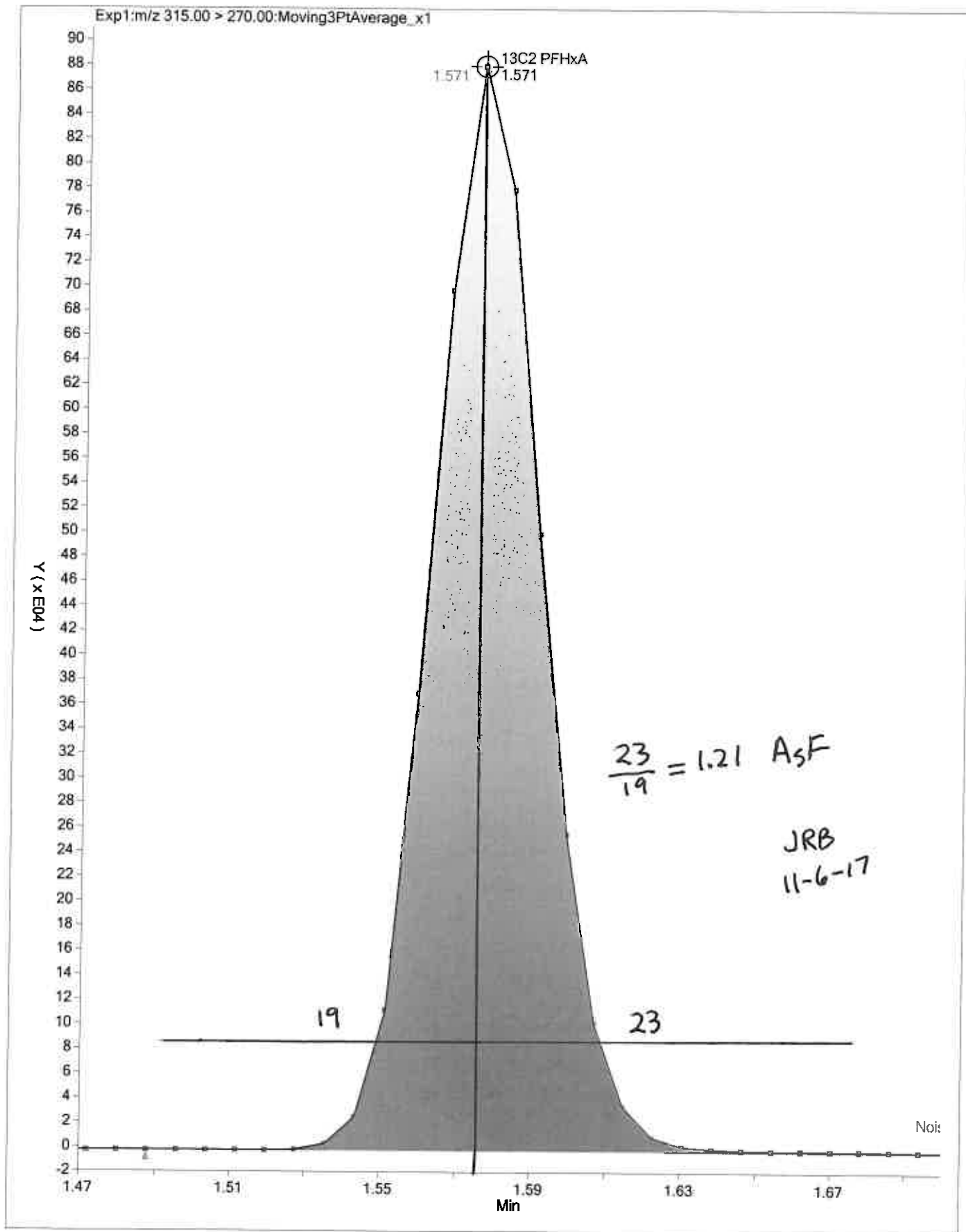
Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

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





FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 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.: 320-33890-1
 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.: 320-33890-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-199060/1 Calibration Date: 12/08/2017 12:35
 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: 2017.12.08_537AA_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.268		23.4	20.0	17.0	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9906		2.35	2.22	5.7	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.824		7.27	6.67	9.0	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9266		4.45	4.45	0.0	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9211		8.72	8.89	-1.9	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6685		4.47	4.45	0.7	50.0
13C2 PFHxA	Ave	1.100	1.158		10.5	10.0	5.3	30.0
13C2 PFDA	Ave	0.7652	0.7463		9.75	10.0	-2.5	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Lab Sample ID: CCV 320-199060/2 Calibration Date: 12/08/2017 12:39
 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: 2017.12.08_537AA_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.9916		150	135	10.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9649		15.5	15.0	3.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.730		46.5	45.0	3.3	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9145		29.7	30.0	-1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9435		60.3	60.0	0.5	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6549		29.6	30.0	-1.4	30.0
13C2 PFHxA	Ave	1.100	1.154		10.5	10.0	4.9	30.0
13C2 PFDA	Ave	0.7652	0.7486		9.78	10.0	-2.2	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Lab Sample ID: CCV 320-199060/11 Calibration Date: 12/08/2017 13:21
 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: 2017.12.08_537AA_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		1.155		49.8	45.0	10.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9267		4.95	5.00	-1.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.764		15.8	15.0	5.3	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8759		9.47	10.0	-5.4	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9316		19.8	20.0	-0.8	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6268		9.44	10.0	-5.6	30.0
13C2 PFHxA	Ave	1.100	1.109		10.1	10.0	0.8	30.0
13C2 PFDA	Ave	0.7652	0.7336		9.59	10.0	-4.1	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Lab Sample ID: CCV 320-199064/4 Calibration Date: 12/08/2017 13:37
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.08_537AA_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.046		161	135	19.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9695		15.5	15.0	3.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.855		49.9	45.0	10.8	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9497		30.8	30.0	2.6	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9911		63.3	60.0	5.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6661		30.1	30.0	0.3	30.0
13C2 PFHxA	Ave	1.100	1.210		11.0	10.0	10.0	30.0
13C2 PFDA	Ave	0.7652	0.7658		10.0	10.0	0.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Lab Sample ID: CCV 320-199064/16 Calibration Date: 12/08/2017 14:33
 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: 2017.12.08_537AA_026.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.192		51.5	45.0	14.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9851		5.26	5.00	5.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.755		15.7	15.0	4.8	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9288		10.0	10.0	0.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.8858		18.9	20.0	-5.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6443		9.70	10.0	-3.0	30.0
13C2 PFHxA	Ave	1.100	1.194		10.9	10.0	8.5	30.0
13C2 PFDA	Ave	0.7652	0.7663		10.0	10.0	0.1	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Lab Sample ID: CCV 320-199066/16 Calibration Date: 12/08/2017 14:33
 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: 2017.12.08_537AA_026.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.192		51.5	45.0	14.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9851		5.26	5.00	5.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.755		15.7	15.0	4.8	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9288		10.0	10.0	0.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.8858		18.9	20.0	-5.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6443		9.70	10.0	-3.0	30.0
13C2 PFHxA	Ave	1.100	1.194		10.9	10.0	8.5	30.0
13C2 PFDA	Ave	0.7652	0.7663		10.0	10.0	0.1	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1
 SDG No.: _____
 Lab Sample ID: CCV 320-199066/20 Calibration Date: 12/08/2017 14:52
 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: 2017.12.08_537AA_030.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.003		152	135	12.5	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9681		15.5	15.0	3.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.787		48.1	45.0	6.8	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9130		29.6	30.0	-1.4	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9672		61.8	60.0	3.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6428		29.0	30.0	-3.2	30.0
13C2 PFHxA	Ave	1.100	1.169		10.6	10.0	6.2	30.0
13C2 PFDA	Ave	0.7652	0.7470		9.76	10.0	-2.4	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1

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.: 320-33890-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/08/2017 12:35

Analysis Batch Number: 199060 End Date: 12/08/2017 13:21

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-199060/1		12/08/2017 12:35	1	2017.12.08_537A A 001.d	GeminiC18 3x100 3(mm)
CCV 320-199060/2 CCVIS		12/08/2017 12:39	1	2017.12.08_537A A 002.d	GeminiC18 3x100 3(mm)
MB 320-198839/1-A		12/08/2017 12:49	1	2017.12.08_537A A 004.d	GeminiC18 3x100 3(mm)
LLCS 320-198839/2-A		12/08/2017 12:53	1	2017.12.08_537A A 005.d	GeminiC18 3x100 3(mm)
320-33890-1		12/08/2017 12:58	1	2017.12.08_537A A 006.d	GeminiC18 3x100 3(mm)
320-33890-1 LMS		12/08/2017 13:03	1	2017.12.08_537A A 007.d	GeminiC18 3x100 3(mm)
320-33890-1 LMSD		12/08/2017 13:07	1	2017.12.08_537A A 008.d	GeminiC18 3x100 3(mm)
ZZZZZ		12/08/2017 13:12	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/08/2017 13:17	1		GeminiC18 3x100 3(mm)
CCV 320-199060/11 CCVIS		12/08/2017 13:21	1	2017.12.08_537A A 011.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/08/2017 13:37

Analysis Batch Number: 199064 End Date: 12/08/2017 14:33

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-199064/4 CCVIS		12/08/2017 13:37	1	2017.12.08_537A A 014.d	GeminiC18 3x100 3(mm)
ZZZZZ		12/08/2017 13:41	1		GeminiC18 3x100 3(mm)
320-33890-2		12/08/2017 13:46	1	2017.12.08_537A A 016.d	GeminiC18 3x100 3(mm)
320-33890-3		12/08/2017 13:51	1	2017.12.08_537A A 017.d	GeminiC18 3x100 3(mm)
320-33890-4		12/08/2017 13:55	1	2017.12.08_537A A 018.d	GeminiC18 3x100 3(mm)
320-33890-5		12/08/2017 14:00	1	2017.12.08_537A A 019.d	GeminiC18 3x100 3(mm)
320-33890-6		12/08/2017 14:05	1	2017.12.08_537A A 020.d	GeminiC18 3x100 3(mm)
320-33890-7		12/08/2017 14:10	1	2017.12.08_537A A 021.d	GeminiC18 3x100 3(mm)
320-33890-8		12/08/2017 14:14	1	2017.12.08_537A A 022.d	GeminiC18 3x100 3(mm)
320-33890-9		12/08/2017 14:19	1	2017.12.08_537A A 023.d	GeminiC18 3x100 3(mm)
320-33890-10		12/08/2017 14:24	1	2017.12.08_537A A 024.d	GeminiC18 3x100 3(mm)
320-33890-11		12/08/2017 14:28	1	2017.12.08_537A A 025.d	GeminiC18 3x100 3(mm)
CCV 320-199064/16 CCVIS		12/08/2017 14:33	1	2017.12.08_537A A 026.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/08/2017 14:33

Analysis Batch Number: 199066 End Date: 12/08/2017 14:52

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-199066/16 CCVIS		12/08/2017 14:33	1	2017.12.08_537A A 026.d	GeminiC18 3x100 3(mm)
ZZZZZ		12/08/2017 14:38	1		GeminiC18 3x100 3(mm)
320-33890-12		12/08/2017 14:42	1	2017.12.08_537A A 028.d	GeminiC18 3x100 3(mm)
320-33890-13		12/08/2017 14:47	1	2017.12.08_537A A 029.d	GeminiC18 3x100 3(mm)
CCV 320-199066/20 CCVIS		12/08/2017 14:52	1	2017.12.08_537A A 030.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33890-1

SDG No.: _____

Batch Number: 198839 Batch Start Date: 12/07/17 13:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 12/08/17 12:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00053
MB 320-198839/1		537, 537				250.00 mL	1.00 mL	7 SU	100 uL
LLCS 320-198839/2		537, 537				250.00 mL	1.00 mL	7 SU	100 uL
320-33890-A-1	NAWC-120417-RW-1 29	537, 537	T	275.10 g	27.48 g	247.6 mL	1.00 mL	7 SU	100 uL
320-33890-A-1	NAWC-120417-RW-1 29 LMS	537, 537	T	277.47 g	27.44 g	250 mL	1.00 mL	7 SU	100 uL
320-33890-A-1	NAWC-120417-RW-1 29 LMSD	537, 537	T	275.48 g	27.31 g	248.2 mL	1.00 mL	7 SU	100 uL
320-33890-A-2	NAWC-120417-FRB- 129	537, 537	T	274.65 g	27.51 g	247.1 mL	1.00 mL	7 SU	100 uL
320-33890-A-3	NAWC-120417-RW-0 55	537, 537	T	276.45 g	27.04 g	249.4 mL	1.00 mL	7 SU	100 uL
320-33890-A-4	NAWC-120417-FRB- 055	537, 537	T	277.54 g	27.31 g	250.2 mL	1.00 mL	7 SU	100 uL
320-33890-A-5	NAWC-120417-RW-0 28	537, 537	T	277.28 g	27.63 g	249.7 mL	1.00 mL	7 SU	100 uL
320-33890-A-6	NAWC-120417-FRB- 028	537, 537	T	275.43 g	27.28 g	248.2 mL	1.00 mL	7 SU	100 uL
320-33890-A-7	NAWC-120417-RW-1 18	537, 537	T	275.41 g	27.35 g	248.1 mL	1.00 mL	7 SU	100 uL
320-33890-A-8	NAWC-120417-FRB- 118	537, 537	T	273.64 g	27.66 g	246 mL	1.00 mL	7 SU	100 uL
320-33890-A-9	NAWC-120417-RW-0 71	537, 537	T	279.44 g	27.65 g	251.8 mL	1.00 mL	7 SU	100 uL
320-33890-A-10	NAWC-120417-FRB- 071	537, 537	T	272.63 g	27.22 g	245.4 mL	1.00 mL	7 SU	100 uL
320-33890-A-11	NAWC-120417-RW-0 75	537, 537	T	274.87 g	27.70 g	247.2 mL	1.00 mL	7 SU	100 uL
320-33890-A-12	NAWC-120417-FRB- 075	537, 537	T	275.86 g	27.24 g	248.6 mL	1.00 mL	7 SU	100 uL
320-33890-A-13	WGNA-120417-DUP1 3	537, 537	T	278.84 g	27.60 g	251.2 mL	1.00 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-LSP 00025	LC537-SU 00056	AnalysisComment			
MB 320-198839/1		537, 537			100 uL	C1 ND			
LLCS 320-198839/2		537, 537		100 uL	100 uL	C1 ND			
320-33890-A-1	NAWC-120417-RW-1 29	537, 537	T		100 uL	C1 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.: 320-33890-1

SDG No.: _____

Batch Number: 198839 Batch Start Date: 12/07/17 13:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 12/08/17 12:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-LSP 00025	LC537-SU 00056	AnalysisComment			
320-33890-A-1 LMS	NAWC-120417-RW-1 29	537, 537	T	100 uL	100 uL	C1 ND			
320-33890-A-1 LMSD	NAWC-120417-RW-1 29	537, 537	T	100 uL	100 uL	C1 ND			
320-33890-A-2	NAWC-120417-FRB- 129	537, 537	T		100 uL	C1 ND			
320-33890-A-3	NAWC-120417-RW-0 55	537, 537	T		100 uL	C1 ND			
320-33890-A-4	NAWC-120417-FRB- 055	537, 537	T		100 uL	C1 ND			
320-33890-A-5	NAWC-120417-RW-0 28	537, 537	T		100 uL	C1 ND			
320-33890-A-6	NAWC-120417-FRB- 028	537, 537	T		100 uL	C1 ND			
320-33890-A-7	NAWC-120417-RW-1 18	537, 537	T		100 uL	C1 ND			
320-33890-A-8	NAWC-120417-FRB- 118	537, 537	T		100 uL	C1 ND			
320-33890-A-9	NAWC-120417-RW-0 71	537, 537	T		100 uL	C1 ND			
320-33890-A-10	NAWC-120417-FRB- 071	537, 537	T		100 uL	C1 ND			
320-33890-A-11	NAWC-120417-RW-0 75	537, 537	T		100 uL	C1 ND			
320-33890-A-12	NAWC-120417-FRB- 075	537, 537	T		100 uL	C1 ND			
320-33890-A-13	WGNA-120417-DUP1 3	537, 537	T		100 uL	C1 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.: 320-33890-1

SDG No.: _____

Batch Number: 198839 Batch Start Date: 12/07/17 13:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 12/08/17 12:30

Batch Notes	
Analyst ID - Aliquot Step	KMK
Analyst ID - Concentration	CCB/KMK
Analyst ID - Final Volume Step	KMK
Internal Standard ID#	1099353
Manifold ID	1, 4
Methanol ID	1095362
pH Indicator ID	4390-01 (Lot 2517)
Pipette ID	M16387D
Analyst ID - IS Reagent Drop	VPM
Analyst ID - IS Reagent Drop Witness	KMK
Analyst ID - SU Reagent Drop	CCB
Analyst ID - SU Reagent Drop Witness	KMK
Analyst ID - TA Reagent Drop	CCB
Analyst ID - TA Reagent Drop Witness	KMK
SPE Cartridge ID	6357081-11
Trizma ID	SLBR4303V
Reagent Water ID	12-4-17

Basis	Basis Description
T	Total/NA

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

No Box yet

Aqueous Extraction Analysis Sheet

AB 12/8/17

Batch Number: 320-198839

(To Accompany Samples to Instruments)

Analyst: Kolstad, Kate M

Batch Open: 12/7/2017 1:23:00PM

Method Code: 320-537_Prep-320

Batch End: 12/8/2017 12:30:00PM

Extraction of Perfluorinated Alkyl Acids

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB-320-198839/1 N/A	N/A		250.00 mL	7			N/A	N/A	N/A	CI ND	
			1.00 mL								
2 LLCS-320-198839/2 N/A	N/A		250.00 mL	7			N/A	N/A	N/A	CI ND	
			1.00 mL								
3 320-33890-A-1 (537_DOD5)	N/A (320-33890-1)	275.10 g	247.6 mL	7			12/9/17	16_Days	4	CI ND	
		27.48 g	1.00 mL								
4 320-33890-A-1-LMS (537_DOD5)	N/A (320-33890-1)	277.47 g	250 mL	7			12/9/17	16_Days	4	CI ND	
		27.44 g	1.00 mL								
5 320-33890-A-1-LMSD (537_DOD5)	N/A (320-33890-1)	275.48 g	248.2 mL	7			12/9/17	16_Days	4	CI ND	
		27.31 g	1.00 mL								
6 320-33890-A-2 (537_DOD5)	N/A (320-33890-1)	274.65 g	247.1 mL	7			12/9/17	16_Days	4	CI ND	
		27.51 g	1.00 mL								
7 320-33890-A-3 (537_DOD5)	N/A (320-33890-1)	276.45 g	249.4 mL	7			12/9/17	16_Days	4	CI ND	
		27.04 g	1.00 mL								
8 320-33890-A-4 (537_DOD5)	N/A (320-33890-1)	277.54 g	250.2 mL	7			12/9/17	16_Days	4	CI ND	
		27.31 g	1.00 mL								
9 320-33890-A-5 (537_DOD5)	N/A (320-33890-1)	277.28 g	249.7 mL	7			12/9/17	16_Days	4	CI ND	
		27.63 g	1.00 mL								
10 320-33890-A-6 (537_DOD5)	N/A (320-33890-1)	275.43 g	248.2 mL	7			12/9/17	16_Days	4	CI ND	
		27.28 g	1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)









Batch Number: 320-198839

Analyst: Kolstad, Kate M

Batch Open: 12/7/2017 1:23:00PM

Method Code: 320-537_Prep-320

Batch End:

11	320-33890-A-7 (537_DOD5)	N/A (320-33890-1)	275.41 g	248.1 mL	7			12/9/17	16_Days	4	CI ND	 320-33890-A-7-A1
			27.35 g	1.00 mL								
12	320-33890-A-8 (537_DOD5)	N/A (320-33890-1)	273.64 g	246 mL	7			12/9/17	16_Days	4	CI ND	 320-33890-A-8-A1
			27.66 g	1.00 mL								
13	320-33890-A-9 (537_DOD5)	N/A (320-33890-1)	279.44 g	251.8 mL	7			12/9/17	16_Days	4	CI ND	 320-33890-A-9-A1
			27.65 g	1.00 mL								
14	320-33890-A-10 (537_DOD5)	N/A (320-33890-1)	272.63 g	245.4 mL	7			12/9/17	16_Days	4	CI ND	 320-33890-A-10-A1
			27.22 g	1.00 mL								
15	320-33890-A-11 (537_DOD5)	N/A (320-33890-1)	274.87 g	247.2 mL	7			12/9/17	16_Days	4	CI ND	 320-33890-A-11-A1
			27.70 g	1.00 mL								
16	320-33890-A-12 (537_DOD5)	N/A (320-33890-1)	275.86 g	248.6 mL	7			12/9/17	16_Days	4	CI ND	 320-33890-A-12-A1
			27.24 g	1.00 mL								
17	320-33890-A-13 (537_DOD5)	N/A (320-33890-1)	278.84 g	251.2 mL	7			12/9/17	16_Days	4	CI ND	 320-33890-A-13-A1
			27.60 g	1.00 mL								
18	320-33811-B-2 (537)	N/A (320-33811-1)	273.81 g	245.9 mL	7			12/8/17	4_Day_RUSH	4	CI ND	 320-33811-B-2-A1
			27.88 g	1.00 mL							RX	

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Kolstad, Kate M

Batch Number: 320-198839

Method Code: 320-537_Prep-320

Batch Open: 12/7/2017 1:23:00PM

Batch End:

Batch Notes

Manifold ID 1, 4

pH Indicator ID 4390-01 (Lot 2517)

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-11

Methanol ID 1095362

Reagent Water ID 12-4-17

Internal Standard ID# 1099353

Pipette ID M16387D

Analyst ID - TA Reagent Drop CCB

Analyst ID - TA Reagent Drop KMK

Witness

Analyst ID - SU Reagent Drop CCB

Analyst ID - SU Reagent Drop KMK

Witness

Analyst ID - IS Reagent Drop VPM

Analyst ID - IS Reagent Drop KMK

Witness

Analyst ID - Concentration CCB/KMK

Analyst ID - Aliquot Step KMK

Analyst ID - Final Volume Step KMK

Batch Comment N/A

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Kolstad, Kate M

Batch Number: 320-198839

Method Code: 320-537_Prep-320

Batch Open: 12/7/2017 1:23:00PM

Batch End:

Comments

Login Comments for Job 33811: Cert check sjf NA
320-33811-B-2

Rework Comments: low surrogate recovery, maybe it was lost during the blow down

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-198839

Analyst: Kolstad, Kate M

Batch Open: 12/7/2017 1:23:00PM

Method Code: 320-537_Prep-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-198839/1	LC537-SU_00056	100 uL	1.00 mL	CCK 12-7-17	KMK 12-7-17
LLCS 320-198839/2	LC537-LSP_00025	100 uL	1.00 mL		
LLCS 320-198839/2	LC537-SU_00056	100 uL	1.00 mL		
320-33890-A-1	LC537-SU_00056	100 uL	1.00 mL		
320-33890-A-1 LMS	LC537-LSP_00025	100 uL	1.00 mL		
320-33890-A-1 LMS	LC537-SU_00056	100 uL	1.00 mL		
320-33890-A-1 LMSD	LC537-LSP_00025	100 uL	1.00 mL		
320-33890-A-1 LMSD	LC537-SU_00056	100 uL	1.00 mL		
320-33890-A-2	LC537-SU_00056	100 uL	1.00 mL		
320-33890-A-3	LC537-SU_00056	100 uL	1.00 mL		
320-33890-A-4	LC537-SU_00056	100 uL	1.00 mL		
320-33890-A-5	LC537-SU_00056	100 uL	1.00 mL		
320-33890-A-6	LC537-SU_00056	100 uL	1.00 mL		
320-33890-A-7	LC537-SU_00056	100 uL	1.00 mL		
320-33890-A-8	LC537-SU_00056	100 uL	1.00 mL		
320-33890-A-9	LC537-SU_00056	100 uL	1.00 mL		
320-33890-A-10	LC537-SU_00056	100 uL	1.00 mL		
320-33890-A-11	LC537-SU_00056	100 uL	1.00 mL		

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-198839

Analyst: Kolstad, Kate M

Batch Open: 12/7/2017 1:23:00PM

Method Code: 320-537_Prep-320

Batch End:

320-33890-A-12	LC537-SU_00056	100 uL	1.00 mL	CS 12-7-17 ↓	KMK 12-7-17 ↓
320-33890-A-13	LC537-SU_00056	100 uL	1.00 mL		
320-33811-B-2	LC537-SU_00056	100 uL	1.00 mL		

Reagent	Other Reagents: Amount/Units	Lot#:

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PFAS Calibration Calculations:

Initial Calibration 11/3/2017
 Instrument A8_N

Perfluorohexanesulfonic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
3	568156	3298877	28.7	1.64764	1.6459
6.67	1312135	3450592	28.7	1.63622	1.6355
15	2908204	3194016	28.7	1.74212	1.7405
30	5871843	3374600	28.7	1.66461	1.6631
45	8413133	3199479	28.7	1.67706	1.6755
60	11071993	3141787	28.7	1.68570	1.6841
Average				1.67556	1.6741
Standard Deviation				0.0374	
RSD				0.0223	
%RSD				2.23033	2.2

Continuing Calibration 11/21/2017 @ 9:06
 A8_N

Perfluorohexanesulfonic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
6.67	1255050	3269095	28.7	1.6519	-1.324769	1.651	-1.4

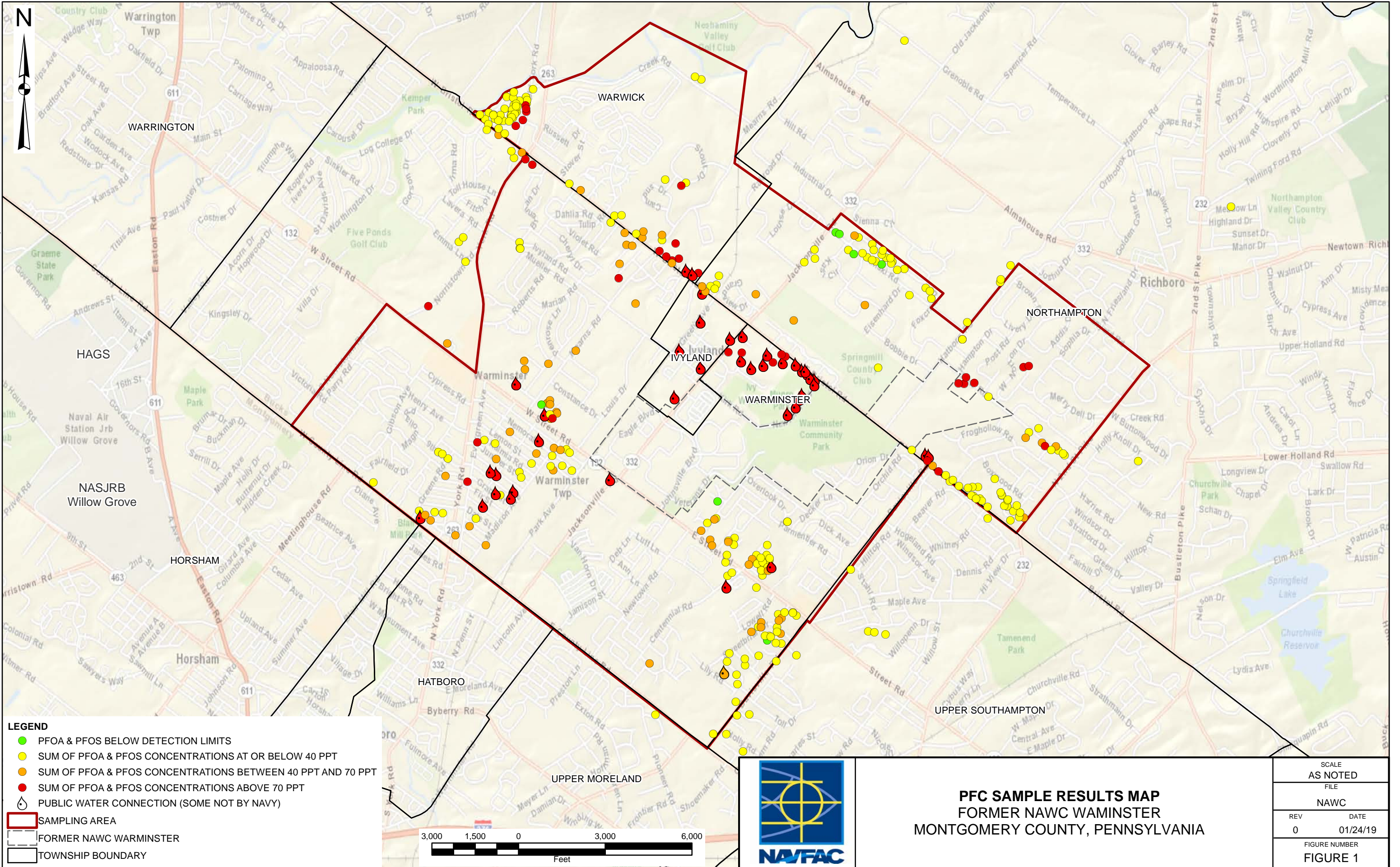
Willow Grove
SDG 320-33338-1

Sample Identification WGNA-111417-RW-0104

Compound Perfluorohexanesulfonic acid

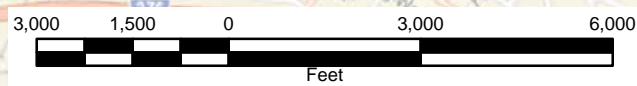
Compound Area	1604663
Internal Standard Amount (ng)	28.7
Dilution Factor	1
Internal Standard Area	3159115
Average RRF	1.6741
Sample Volume(ml)	247.9
Volume Extract (ml)	1
Injection Volume (µl)	1
Concentration	35.1271 ng/L

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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 WARRINSTER
- TOWNSHIP BOUNDARY



PFC SAMPLE RESULTS MAP
 FORMER NAWC WARRINSTER
 MONTGOMERY COUNTY, PENNSYLVANIA

SCALE AS NOTED	
FILE	
NAWC	
REV	DATE
0	01/24/19
FIGURE NUMBER	
FIGURE 1	