



**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 320-36794-1**

*Naval Air Warfare Center Warminster
Warminster, Pennsylvania*

August 2019

ANALYTICAL REPORT

Job Number: 320-36794-1

Job Description: Warminster: PFAS, NAS JRB Willow Grove

For:
Tetra Tech, Inc.
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Attention: Andy Frebowitz



Approved for release.
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Project Manager I
3/19/2018 11:55 AM

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Definitions/Glossary

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

TestAmerica Job ID: 320-36794-1

Qualifiers

LCMS

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

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
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
320-36794-1

Receipt

The samples were received on 3/6/2018 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.9° 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: 320-36794-1

Client Sample ID: NAWC-030518-RW-055

Lab Sample ID: 320-36794-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	4.3	J	19	2.7	ng/L	1		537	Total/NA

Client Sample ID: NAWC-030518-FRB-055

Lab Sample ID: 320-36794-2

No Detections.

Client Sample ID: NAWC-030518-RW-124

Lab Sample ID: 320-36794-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	34	J M	40	6.9	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	30		20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	17	J	30	5.6	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.0	J	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-030518-FRB-124

Lab Sample ID: 320-36794-4

No Detections.

Client Sample ID: NAWC-030518-RW-201

Lab Sample ID: 320-36794-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	9.8	J M	38	6.5	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	14	J	19	2.7	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.3	J	9.6	1.8	ng/L	1		537	Total/NA

Client Sample ID: NAWC-030518-FRB-201

Lab Sample ID: 320-36794-6

No Detections.

Client Sample ID: NAWC-030518-RW-190

Lab Sample ID: 320-36794-7

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	11	J M	38	6.5	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	12	J M	19	2.7	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.5	J	9.6	1.8	ng/L	1		537	Total/NA

Client Sample ID: NAWC-030518-FRB-190

Lab Sample ID: 320-36794-8

No Detections.

Client Sample Results

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

TestAmerica Job ID: 320-36794-1

Client Sample ID: NAWC-030518-RW-055

Date Collected: 03/05/18 10:10

Date Received: 03/06/18 09:40

Lab Sample ID: 320-36794-1

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U M	39	6.6	ng/L	—	03/12/18 07:09	03/15/18 22:43	1
Perfluorooctanoic acid (PFOA)	4.3	J	19	2.7	ng/L	—	03/12/18 07:09	03/15/18 22:43	1
Perfluorononanoic acid (PFNA)	19	U	23	7.8	ng/L	—	03/12/18 07:09	03/15/18 22:43	1
Perfluorohexanesulfonic acid (PFHxS)	12	U M	29	5.4	ng/L	—	03/12/18 07:09	03/15/18 22:43	1
Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	1.8	ng/L	—	03/12/18 07:09	03/15/18 22:43	1
Perfluorobutanesulfonic acid (PFBS)	35	U M	88	16	ng/L	—	03/12/18 07:09	03/15/18 22:43	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	95		70 - 130				03/12/18 07:09	03/15/18 22:43	1
13C2 PFDA	117		70 - 130				03/12/18 07:09	03/15/18 22:43	1

Client Sample ID: NAWC-030518-FRB-055

Date Collected: 03/05/18 10:05

Date Received: 03/06/18 09:40

Lab Sample ID: 320-36794-2

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	U	38	6.5	ng/L	—	03/12/18 07:09	03/15/18 22:48	1
Perfluorooctanoic acid (PFOA)	7.7	U	19	2.7	ng/L	—	03/12/18 07:09	03/15/18 22:48	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L	—	03/12/18 07:09	03/15/18 22:48	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	29	5.3	ng/L	—	03/12/18 07:09	03/15/18 22:48	1
Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	1.8	ng/L	—	03/12/18 07:09	03/15/18 22:48	1
Perfluorobutanesulfonic acid (PFBS)	34	U	86	15	ng/L	—	03/12/18 07:09	03/15/18 22:48	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	93		70 - 130				03/12/18 07:09	03/15/18 22:48	1
13C2 PFDA	101		70 - 130				03/12/18 07:09	03/15/18 22:48	1

Client Sample ID: NAWC-030518-RW-124

Date Collected: 03/05/18 10:40

Date Received: 03/06/18 09:40

Lab Sample ID: 320-36794-3

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	34	J M	40	6.9	ng/L	—	03/12/18 07:09	03/15/18 22:52	1
Perfluorooctanoic acid (PFOA)	30		20	2.8	ng/L	—	03/12/18 07:09	03/15/18 22:52	1
Perfluorononanoic acid (PFNA)	20	U	24	8.1	ng/L	—	03/12/18 07:09	03/15/18 22:52	1
Perfluorohexanesulfonic acid (PFHxS)	17	J	30	5.6	ng/L	—	03/12/18 07:09	03/15/18 22:52	1
Perfluoroheptanoic acid (PFHpA)	6.0	J	10	1.9	ng/L	—	03/12/18 07:09	03/15/18 22:52	1
Perfluorobutanesulfonic acid (PFBS)	36	U	91	16	ng/L	—	03/12/18 07:09	03/15/18 22:52	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	94		70 - 130				03/12/18 07:09	03/15/18 22:52	1
13C2 PFDA	110		70 - 130				03/12/18 07:09	03/15/18 22:52	1

Client Sample Results

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

TestAmerica Job ID: 320-36794-1

Client Sample ID: NAWC-030518-FRB-124

Date Collected: 03/05/18 10:35

Date Received: 03/06/18 09:40

Lab Sample ID: 320-36794-4

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.7	ng/L	—	03/12/18 07:09	03/15/18 22:57	1
Perfluorooctanoic acid (PFOA)	7.9	U	20	2.8	ng/L	—	03/12/18 07:09	03/15/18 22:57	1
Perfluorononanoic acid (PFNA)	20	U	24	7.9	ng/L	—	03/12/18 07:09	03/15/18 22:57	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.4	ng/L	—	03/12/18 07:09	03/15/18 22:57	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	9.9	1.9	ng/L	—	03/12/18 07:09	03/15/18 22:57	1
Perfluorobutanesulfonic acid (PFBS)	36	U	89	16	ng/L	—	03/12/18 07:09	03/15/18 22:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	104		70 - 130	03/12/18 07:09	03/15/18 22:57	1
13C2 PFDA	111		70 - 130	03/12/18 07:09	03/15/18 22:57	1

Client Sample ID: NAWC-030518-RW-201

Date Collected: 03/05/18 11:10

Date Received: 03/06/18 09:40

Lab Sample ID: 320-36794-5

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	9.8	J M	38	6.5	ng/L	—	03/12/18 07:09	03/15/18 23:02	1
Perfluorooctanoic acid (PFOA)	14	J	19	2.7	ng/L	—	03/12/18 07:09	03/15/18 23:02	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L	—	03/12/18 07:09	03/15/18 23:02	1
Perfluorohexanesulfonic acid (PFHxS)	12	U M	29	5.3	ng/L	—	03/12/18 07:09	03/15/18 23:02	1
Perfluoroheptanoic acid (PFHpA)	4.3	J	9.6	1.8	ng/L	—	03/12/18 07:09	03/15/18 23:02	1
Perfluorobutanesulfonic acid (PFBS)	35	U M	86	15	ng/L	—	03/12/18 07:09	03/15/18 23:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	90		70 - 130	03/12/18 07:09	03/15/18 23:02	1
13C2 PFDA	112		70 - 130	03/12/18 07:09	03/15/18 23:02	1

Client Sample ID: NAWC-030518-FRB-201

Date Collected: 03/05/18 11:05

Date Received: 03/06/18 09:40

Lab Sample ID: 320-36794-6

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	39	6.6	ng/L	—	03/12/18 07:09	03/15/18 23:06	1
Perfluorooctanoic acid (PFOA)	7.8	U	19	2.7	ng/L	—	03/12/18 07:09	03/15/18 23:06	1
Perfluorononanoic acid (PFNA)	19	U	23	7.8	ng/L	—	03/12/18 07:09	03/15/18 23:06	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.3	ng/L	—	03/12/18 07:09	03/15/18 23:06	1
Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	1.8	ng/L	—	03/12/18 07:09	03/15/18 23:06	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	16	ng/L	—	03/12/18 07:09	03/15/18 23:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	103		70 - 130	03/12/18 07:09	03/15/18 23:06	1
13C2 PFDA	112		70 - 130	03/12/18 07:09	03/15/18 23:06	1

Client Sample Results

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

TestAmerica Job ID: 320-36794-1

Client Sample ID: NAWC-030518-RW-190

Date Collected: 03/05/18 11:40

Date Received: 03/06/18 09:40

Lab Sample ID: 320-36794-7

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	11	J M	38	6.5	ng/L		03/12/18 07:09	03/15/18 23:20	1
Perfluorooctanoic acid (PFOA)	12	J M	19	2.7	ng/L		03/12/18 07:09	03/15/18 23:20	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L		03/12/18 07:09	03/15/18 23:20	1
Perfluorohexanesulfonic acid (PFHxS)	12	U M	29	5.3	ng/L		03/12/18 07:09	03/15/18 23:20	1
Perfluoroheptanoic acid (PFHpA)	3.5	J	9.6	1.8	ng/L		03/12/18 07:09	03/15/18 23:20	1
Perfluorobutanesulfonic acid (PFBS)	35	U	86	15	ng/L		03/12/18 07:09	03/15/18 23:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	97		70 - 130	03/12/18 07:09	03/15/18 23:20	1
13C2 PFDA	112		70 - 130	03/12/18 07:09	03/15/18 23:20	1

Client Sample ID: NAWC-030518-FRB-190

Date Collected: 03/05/18 11:35

Date Received: 03/06/18 09:40

Lab Sample ID: 320-36794-8

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	14	U	36	6.1	ng/L		03/12/18 07:09	03/15/18 23:34	1
Perfluorooctanoic acid (PFOA)	7.2	U	18	2.5	ng/L		03/12/18 07:09	03/15/18 23:34	1
Perfluorononanoic acid (PFNA)	18	U	22	7.2	ng/L		03/12/18 07:09	03/15/18 23:34	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	27	4.9	ng/L		03/12/18 07:09	03/15/18 23:34	1
Perfluoroheptanoic acid (PFHpA)	3.6	U	9.0	1.7	ng/L		03/12/18 07:09	03/15/18 23:34	1
Perfluorobutanesulfonic acid (PFBS)	32	U	81	14	ng/L		03/12/18 07:09	03/15/18 23:34	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	101		70 - 130	03/12/18 07:09	03/15/18 23:34	1
13C2 PFDA	116		70 - 130	03/12/18 07:09	03/15/18 23:34	1

Default Detection Limits

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-36794-1

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

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

Prep: 537

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

Surrogate Summary

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

TestAmerica Job ID: 320-36794-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	PFHxA (70-130)	PFDA (70-130)
320-36794-1	NAWC-030518-RW-055	95	117
320-36794-2	NAWC-030518-FRB-055	93	101
320-36794-3	NAWC-030518-RW-124	94	110
320-36794-4	NAWC-030518-FRB-124	104	111
320-36794-5	NAWC-030518-RW-201	90	112
320-36794-6	NAWC-030518-FRB-201	103	112
320-36794-7	NAWC-030518-RW-190	97	112
320-36794-7 MS	NAWC-030518-RW-190	87	112
320-36794-7 MSD	NAWC-030518-RW-190	95	107
320-36794-8	NAWC-030518-FRB-190	101	116
LCS 320-212343/2-A	Lab Control Sample	91	109
MB 320-212343/1-A	Method Blank	102	108

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: 320-36794-1

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

Lab Sample ID: MB 320-212343/1-A

Matrix: Water

Analysis Batch: 213297

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 212343

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		03/12/18 07:09	03/15/18 22:34	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		03/12/18 07:09	03/15/18 22:34	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		03/12/18 07:09	03/15/18 22:34	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		03/12/18 07:09	03/15/18 22:34	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		03/12/18 07:09	03/15/18 22:34	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		03/12/18 07:09	03/15/18 22:34	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	102		70 - 130	03/12/18 07:09	03/15/18 22:34	1
13C2 PFDA	108		70 - 130	03/12/18 07:09	03/15/18 22:34	1

Lab Sample ID: LCS 320-212343/2-A

Matrix: Water

Analysis Batch: 213297

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 212343

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorooctanesulfonic acid (PFOS)	134	149	M	ng/L		111	70 - 130
Perfluorooctanoic acid (PFOA)	67.0	71.9		ng/L		107	70 - 130
Perfluorononanoic acid (PFNA)	66.7	68.7		ng/L		103	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	100	114		ng/L		114	70 - 130
Perfluoroheptanoic acid (PFHpA)	33.3	35.2		ng/L		105	70 - 130
Perfluorobutanesulfonic acid (PFBS)	300	271		ng/L		90	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
13C2 PFHxA	91		70 - 130
13C2 PFDA	109		70 - 130

Lab Sample ID: 320-36794-7 MS

Matrix: Water

Analysis Batch: 213299

Client Sample ID: NAWC-030518-RW-190

Prep Type: Total/NA

Prep Batch: 212343

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Perfluorooctanesulfonic acid (PFOS)	11	J M	129	153	M	ng/L		110	70 - 130
Perfluorooctanoic acid (PFOA)	12	J M	64.8	83.0		ng/L		110	70 - 130
Perfluorononanoic acid (PFNA)	19	U	64.5	72.7		ng/L		113	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	12	U M	96.7	104	M	ng/L		107	70 - 130
Perfluoroheptanoic acid (PFHpA)	3.5	J	32.2	38.8		ng/L		110	70 - 130
Perfluorobutanesulfonic acid (PFBS)	35	U	290	248		ng/L		85	70 - 130

Surrogate	MS %Recovery	MS Qualifier	Limits
13C2 PFHxA	87		70 - 130
13C2 PFDA	112		70 - 130

TestAmerica Sacramento

QC Sample Results

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

TestAmerica Job ID: 320-36794-1

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

Lab Sample ID: 320-36794-7 MSD

Matrix: Water

Analysis Batch: 213299

Client Sample ID: NAWC-030518-RW-190

Prep Type: Total/NA

Prep Batch: 212343

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	11	J M	122	147	M	ng/L		111	70 - 130	4	30
Perfluorooctanoic acid (PFOA)	12	J M	61.1	77.3		ng/L		107	70 - 130	7	30
Perfluorononanoic acid (PFNA)	19	U	60.8	66.3		ng/L		109	70 - 130	9	30
Perfluorohexanesulfonic acid (PFHxS)	12	U M	91.2	105		ng/L		115	70 - 130	1	30
Perfluoroheptanoic acid (PFHpA)	3.5	J	30.4	35.7		ng/L		106	70 - 130	8	30
Perfluorobutanesulfonic acid (PFBS)	35	U	274	283		ng/L		103	70 - 130	13	30
Surrogate	MSD %Recovery	MSD Qualifier	Limits								
13C2 PFHxA	95		70 - 130								
13C2 PFDA	107		70 - 130								

QC Association Summary

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

TestAmerica Job ID: 320-36794-1

LCMS

Prep Batch: 212343

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-36794-1	NAWC-030518-RW-055	Total/NA	Water	537	
320-36794-2	NAWC-030518-FRB-055	Total/NA	Water	537	
320-36794-3	NAWC-030518-RW-124	Total/NA	Water	537	
320-36794-4	NAWC-030518-FRB-124	Total/NA	Water	537	
320-36794-5	NAWC-030518-RW-201	Total/NA	Water	537	
320-36794-6	NAWC-030518-FRB-201	Total/NA	Water	537	
320-36794-7	NAWC-030518-RW-190	Total/NA	Water	537	
320-36794-8	NAWC-030518-FRB-190	Total/NA	Water	537	
MB 320-212343/1-A	Method Blank	Total/NA	Water	537	
LCS 320-212343/2-A	Lab Control Sample	Total/NA	Water	537	
320-36794-7 MS	NAWC-030518-RW-190	Total/NA	Water	537	
320-36794-7 MSD	NAWC-030518-RW-190	Total/NA	Water	537	

Analysis Batch: 213297

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-36794-1	NAWC-030518-RW-055	Total/NA	Water	537	212343
320-36794-2	NAWC-030518-FRB-055	Total/NA	Water	537	212343
320-36794-3	NAWC-030518-RW-124	Total/NA	Water	537	212343
320-36794-4	NAWC-030518-FRB-124	Total/NA	Water	537	212343
320-36794-5	NAWC-030518-RW-201	Total/NA	Water	537	212343
320-36794-6	NAWC-030518-FRB-201	Total/NA	Water	537	212343
MB 320-212343/1-A	Method Blank	Total/NA	Water	537	212343
LCS 320-212343/2-A	Lab Control Sample	Total/NA	Water	537	212343

Analysis Batch: 213299

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-36794-7	NAWC-030518-RW-190	Total/NA	Water	537	212343
320-36794-8	NAWC-030518-FRB-190	Total/NA	Water	537	212343
320-36794-7 MS	NAWC-030518-RW-190	Total/NA	Water	537	212343
320-36794-7 MSD	NAWC-030518-RW-190	Total/NA	Water	537	212343

Lab Chronicle

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

TestAmerica Job ID: 320-36794-1

Client Sample ID: NAWC-030518-RW-055

Date Collected: 03/05/18 10:10

Date Received: 03/06/18 09:40

Lab Sample ID: 320-36794-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			212343	03/12/18 07:09	SK	TAL SAC
Total/NA	Analysis	537		1	213297	03/15/18 22:43	JRB	TAL SAC

Client Sample ID: NAWC-030518-FRB-055

Date Collected: 03/05/18 10:05

Date Received: 03/06/18 09:40

Lab Sample ID: 320-36794-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			212343	03/12/18 07:09	SK	TAL SAC
Total/NA	Analysis	537		1	213297	03/15/18 22:48	JRB	TAL SAC

Client Sample ID: NAWC-030518-RW-124

Date Collected: 03/05/18 10:40

Date Received: 03/06/18 09:40

Lab Sample ID: 320-36794-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			212343	03/12/18 07:09	SK	TAL SAC
Total/NA	Analysis	537		1	213297	03/15/18 22:52	JRB	TAL SAC

Client Sample ID: NAWC-030518-FRB-124

Date Collected: 03/05/18 10:35

Date Received: 03/06/18 09:40

Lab Sample ID: 320-36794-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			212343	03/12/18 07:09	SK	TAL SAC
Total/NA	Analysis	537		1	213297	03/15/18 22:57	JRB	TAL SAC

Client Sample ID: NAWC-030518-RW-201

Date Collected: 03/05/18 11:10

Date Received: 03/06/18 09:40

Lab Sample ID: 320-36794-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			212343	03/12/18 07:09	SK	TAL SAC
Total/NA	Analysis	537		1	213297	03/15/18 23:02	JRB	TAL SAC

Client Sample ID: NAWC-030518-FRB-201

Date Collected: 03/05/18 11:05

Date Received: 03/06/18 09:40

Lab Sample ID: 320-36794-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			212343	03/12/18 07:09	SK	TAL SAC
Total/NA	Analysis	537		1	213297	03/15/18 23:06	JRB	TAL SAC

TestAmerica Sacramento

Lab Chronicle

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

TestAmerica Job ID: 320-36794-1

Client Sample ID: NAWC-030518-RW-190

Date Collected: 03/05/18 11:40

Date Received: 03/06/18 09:40

Lab Sample ID: 320-36794-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			212343	03/12/18 07:09	SK	TAL SAC
Total/NA	Analysis	537		1	213299	03/15/18 23:20	JRB	TAL SAC

Client Sample ID: NAWC-030518-FRB-190

Date Collected: 03/05/18 11:35

Date Received: 03/06/18 09:40

Lab Sample ID: 320-36794-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			212343	03/12/18 07:09	SK	TAL SAC
Total/NA	Analysis	537		1	213299	03/15/18 23:34	JRB	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-36794-1

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

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-18
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-18
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-18
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-18 *
Kansas	NELAP	7	E-10375	10-31-18
L-A-B	DoD ELAP		L2468	01-20-21
Louisiana	NELAP	6	30612	06-30-18
Maine	State Program	1	CA0004	04-14-18
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-18
New Hampshire	NELAP	1	2997	04-18-18
New Jersey	NELAP	2	CA005	06-30-18
New York	NELAP	2	11666	04-01-18
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-18 *
Texas	NELAP	6	T104704399	05-31-18
US Fish & Wildlife	Federal		LE148388-0	07-31-18
USDA	Federal		P330-11-00436	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-18 *
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-18
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

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

TestAmerica Sacramento

Method Summary

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

TestAmerica Job ID: 320-36794-1

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: 320-36794-1

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

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-36794-1	NAWC-030518-RW-055	Water	03/05/18 10:10	03/06/18 09:40
320-36794-2	NAWC-030518-FRB-055	Water	03/05/18 10:05	03/06/18 09:40
320-36794-3	NAWC-030518-RW-124	Water	03/05/18 10:40	03/06/18 09:40
320-36794-4	NAWC-030518-FRB-124	Water	03/05/18 10:35	03/06/18 09:40
320-36794-5	NAWC-030518-RW-201	Water	03/05/18 11:10	03/06/18 09:40
320-36794-6	NAWC-030518-FRB-201	Water	03/05/18 11:05	03/06/18 09:40
320-36794-7	NAWC-030518-RW-190	Water	03/05/18 11:40	03/06/18 09:40
320-36794-8	NAWC-030518-FRB-190	Water	03/05/18 11:35	03/06/18 09:40

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 213143

Lab Sample ID: IC 320-213143/4 Client Sample ID: _____

Date Analyzed: 03/15/18 11:30 Lab File ID: 2018.03.15_537ICAL_004.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.03	Peak assignment corrected	barnettj	03/15/18 13:24

Lab Sample ID: IC 320-213143/5 Client Sample ID: _____

Date Analyzed: 03/15/18 11:34 Lab File ID: 2018.03.15_537ICAL_005.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.01	Peak assignment corrected	barnettj	03/15/18 13:24

Lab Sample ID: IC 320-213143/6 Client Sample ID: _____

Date Analyzed: 03/15/18 11:39 Lab File ID: 2018.03.15_537ICAL_006.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.02	Peak assignment corrected	barnettj	03/15/18 13:24

Lab Sample ID: IC 320-213143/7 ICISAV Client Sample ID: _____

Date Analyzed: 03/15/18 11:44 Lab File ID: 2018.03.15_537ICAL_007.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.04	Peak assignment corrected	barnettj	03/15/18 13:24

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 213143

Lab Sample ID: IC 320-213143/8 Client Sample ID: _____

Date Analyzed: 03/15/18 11:48 Lab File ID: 2018.03.15_537ICAL_008.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.02	Peak assignment corrected	barnettj	03/15/18 13:25

Lab Sample ID: IC 320-213143/9 Client Sample ID: _____

Date Analyzed: 03/15/18 11:53 Lab File ID: 2018.03.15_537ICAL_009.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.01	Peak assignment corrected	barnettj	03/15/18 13:25

Lab Sample ID: CCVL 320-213143/11 Client Sample ID: _____

Date Analyzed: 03/15/18 12:02 Lab File ID: 2018.03.15_537ICAL_011.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.02	Peak assignment corrected	barnettj	03/15/18 13:23

Lab Sample ID: ICV 320-213143/13 Client Sample ID: _____

Date Analyzed: 03/15/18 14:35 Lab File ID: 2018.03.15_537ICAL_013.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.05	Peak assignment corrected	barnettj	03/15/18 14:49

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 213297

Lab Sample ID: CCV 320-213297/12 CCVIS Client Sample ID: _____

Date Analyzed: 03/15/18 22:24 Lab File ID: 2018.03.15_537AAX_016.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.03	Peak assignment corrected	roycea	03/16/18 07:48

Lab Sample ID: LCS 320-212343/2-A Client Sample ID: _____

Date Analyzed: 03/15/18 22:38 Lab File ID: 2018.03.15_537AAX_019.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.03	Peak assignment corrected	barnettj	03/16/18 10:16

Lab Sample ID: 320-36794-1 Client Sample ID: NAWC-030518-RW-055

Date Analyzed: 03/15/18 22:43 Lab File ID: 2018.03.15_537AAX_020.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.38	Missed Peak	barnettj	03/16/18 10:17
Perfluorohexanesulfonic acid (PFHxS)	1.63	Missed Peak	barnettj	03/16/18 10:17
Perfluorooctanesulfonic acid (PFOS)	2.04	Missed Peak	barnettj	03/16/18 10:17

Lab Sample ID: 320-36794-3 Client Sample ID: NAWC-030518-RW-124

Date Analyzed: 03/15/18 22:52 Lab File ID: 2018.03.15_537AAX_022.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.03	Peak assignment corrected	barnettj	03/16/18 10:18

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Instrument ID: A8_N Analysis Batch Number: 213297
 Lab Sample ID: 320-36794-5 Client Sample ID: NAWC-030518-RW-201
 Date Analyzed: 03/15/18 23:02 Lab File ID: 2018.03.15_537AAX_024.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.37	Missed Peak	barnettj	03/16/18 10:18
Perfluorohexanesulfonic acid (PFHxS)	1.62	Missed Peak	barnettj	03/16/18 10:19
Perfluorooctanesulfonic acid (PFOS)	2.00	Missed Peak	barnettj	03/16/18 10:19

Lab Sample ID: CCV 320-213297/22 CCVIS Client Sample ID: _____
 Date Analyzed: 03/15/18 23:11 Lab File ID: 2018.03.15_537AAX_026.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.03	Peak assignment corrected	barnettj	03/16/18 10:14

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 213299

Lab Sample ID: CCV 320-213299/22 CCVIS Client Sample ID: _____

Date Analyzed: 03/15/18 23:11 Lab File ID: 2018.03.15_537AAX_026.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.03	Peak assignment corrected	barnettj	03/16/18 10:14

Lab Sample ID: 320-36794-7 Client Sample ID: NAWC-030518-RW-190

Date Analyzed: 03/15/18 23:20 Lab File ID: 2018.03.15_537AAX_028.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	1.62	Missed Peak	barnettj	03/16/18 10:19
Perfluorooctanoic acid (PFOA)	1.78	Incomplete Integration	barnettj	03/16/18 10:20
Perfluorooctanesulfonic acid (PFOS)	2.00	Incomplete Integration	barnettj	03/16/18 10:20

Lab Sample ID: 320-36794-7 MS Client Sample ID: NAWC-030518-RW-190 MS

Date Analyzed: 03/15/18 23:25 Lab File ID: 2018.03.15_537AAX_029.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	1.62	Incomplete Integration	barnettj	03/16/18 10:20
Perfluorooctanesulfonic acid (PFOS)	2.01	Peak assignment corrected	roycea	03/16/18 07:55

Lab Sample ID: 320-36794-7 MSD Client Sample ID: NAWC-030518-RW-190 MSD

Date Analyzed: 03/15/18 23:30 Lab File ID: 2018.03.15_537AAX_030.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.03	Peak assignment corrected	roycea	03/16/18 07:56

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Instrument ID: A8_N Analysis Batch Number: 213299
 Lab Sample ID: CCV 320-213299/28 CCVIS Client Sample ID: _____
 Date Analyzed: 03/15/18 23:39 Lab File ID: 2018.03.15_537AAX_032.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.03	Peak assignment corrected	roycea	03/16/18 07:56

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-ICV_00030	07/30/18	02/15/18	MeOH/H2O, Lot 067374	10 mL	LC537-IS_00059	1000 uL	13C2-PFOA	10 ng/mL
.LC537-IS_00059	07/30/18	01/30/18	Methanol, Lot 090285	30000 uL	LCM2PFOA 00007	60 uL	13C4 PFOS	28.68 ng/mL
..LCM2PFOA 00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			LCMPFOS 00021	180 uL	13C2-PFOA	0.1 ug/mL
..LCMPFOS 00021	12/12/21	Wellington Laboratories, Lot MPFOS1216					13C4 PFOS	0.2868 ug/mL
LC537-ICV_00030	07/30/18	02/15/18	MeOH/H2O, Lot 067374	10 mL	LC537-SU_00059	1000 uL	13C2 PFDA	50 ug/mL
					LC537ICIM2_00001	400 uL	13C2 PFHxA	47.8 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	10 ng/mL
							Perfluoroheptanoic acid (PFHpA)	100.092 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	10 ng/mL
							Perfluorononanoic acid (PFNA)	20.1619 ng/mL
							Perfluorooctanoic acid (PFOA)	20.1641 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.1702 ng/mL
.LC537-SU_00059	07/30/18	01/30/18	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 00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFHxA 00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116					13C2 PFDA	50 ug/mL
.LC537ICIM2_00001	08/15/18	02/15/18	Methanol, Lot 090285	10 mL	LC537ICIM_00020	0.5 mL	13C2 PFHxA	50 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	2.5023 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.25 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.504047 ug/mL
							Perfluorononanoic acid (PFNA)	0.504103 ug/mL
							Perfluorooctanoic acid (PFOA)	0.504176 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.504255 ug/mL
..LC537ICIM_00020	08/15/18	02/15/18	Methanol, Lot 090285	25 mL	LC537-PFBS2_00009	0.625 mL	Perfluorobutanesulfonic acid (PFBS)	50.0459 ug/mL
					LC537-PFHxA2_00012	0.0625 mL	Perfluoroheptanoic acid (PFHpA)	5 ug/mL
					LC537-PFHxS2_00009	0.126 mL	Perfluorohexanesulfonic acid (PFHxS)	10.0809 ug/mL
					LC537-PFNA2_00010	0.126 mL	Perfluorononanoic acid (PFNA)	10.0821 ug/mL
					LC537-PFOA2_00011	0.126 mL	Perfluorooctanoic acid (PFOA)	10.0835 ug/mL
					LC537-PFOS2_00011	0.126 mL	Perfluorooctanesulfonic acid (PFOS)	10.0851 ug/mL
...LC537-PFBS2_00009	08/15/18	02/15/18	Methanol, Lot 090285	17.1 mL	LC537_PFBS2_00002	0.0343 g	Perfluorobutanesulfonic acid (PFBS)	2001.84 ug/mL
....LC537_PFBS2_00002	09/08/22	Santa Cruz Biotechnology, Lot F0917					Perfluorobutanesulfonic acid (PFBS)	0.998 g/g

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC537-PFHpA2_00012	08/15/18	02/15/18	Methanol, Lot 09092	23.95 mL	LC537_PFHpA2_00002	0.0479 g	Perfluoroheptanoic acid (PFHpA)	2000 ug/mL
...LC537_PFHpA2_00002	06/13/22		Afla Aesar, Lot 10200390		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	1 g/g
...LC537-PFHxS2_00009	08/15/18	02/15/18	Methanol, Lot 090285	25.87 mL	LC537_PFHxS2_00002	0.0569 g	Perfluorohexanesulfonic acid (PFHxS)	2000.19 ug/mL
...LC537_PFHxS2_00002	06/08/22		Santa Cruz Biotechnology, Lot G2516		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA2_00010	08/15/18	02/15/18	Methanol, Lot 090285	16.58 mL	LC537_PFNA2_00002	0.0333 g	Perfluorononanoic acid (PFNA)	2000.41 ug/mL
...LC537_PFNA2_00002	06/14/22		Aldrich, Lot MKCC0699		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.996 g/g
...LC537-PFOA2_00011	08/15/18	02/15/18	Methanol, Lot 090285	22.96 mL	LC537_PFOA2_00002	0.0464 g	Perfluorooctanoic acid (PFOA)	2000.7 ug/mL
...LC537_PFOA2_00002	06/09/22		Afla Aesar, Lot 10199078		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.99 g/g
...LC537-PFOS2_00011	08/15/18	02/15/18	Methanol, Lot 090285	14.71 mL	LC537_PFOS2_00002	0.0378 g	Perfluorooctanesulfonic acid (PFOS)	2001.01 ug/mL
...LC537_PFOS2_00002	06/14/22		Sigma, Lot BCBQ0108V		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.7787 g/g
LC537-IS_00052	03/27/18	09/27/17	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
					(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-L1_00021	04/01/18	02/15/18	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00059	500 uL	13C2-PFOA	10 ng/mL
					LC537-MSP_00032	60 uL	13C4 PFOS	28.68 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	9.0018 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1.00031 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	3.00134 ng/mL
							Perfluorononanoic acid (PFNA)	2.00088 ng/mL
							Perfluorooctanoic acid (PFOA)	2.01129 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.01756 ng/mL
					LC537-SU_00059	500 uL	13C2 PFDA	10 ng/mL
.LC537-IS_00059	07/30/18	01/30/18	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-MSP_00032	04/01/18	01/30/18	Methanol, Lot 141039	40000 uL	LC537SPIM_00026	333.4 uL	13C4 PFOS	47.8 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	750.15 ng/mL
							Perfluoroheptanoic acid (PFHpA)	83.3591 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	250.111 ng/mL
							Perfluorononanoic acid (PFNA)	166.74 ng/mL
							Perfluorooctanoic acid (PFOA)	167.608 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	334.797 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC537SPIM_00026	04/01/18	01/30/18	Methanol, Lot 104453	20000 uL	LC537-PFBS_00009	900 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00016	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0011 ug/mL
					LC537-PFHxS_00011	300 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0074 ug/mL
					LC537-PFNA_00014	400 uL	Perfluorononanoic acid (PFNA)	20.0048 ug/mL
					LC537-PFOA_00015	400 uL	Perfluorooctanoic acid (PFOA)	20.1089 ug/mL
					LC537-PFOS_00009	800 uL	Perfluorooctanesulfonic acid (PFOS)	40.1676 ug/mL
...LC537-PFBS_00009	04/01/18	01/30/18	Methanol, Lot 090285	48.7 mL	LC537_PFBS_00002	0.0974 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_00016	04/01/18	01/30/18	Methanol, Lot 090285	59.74 mL	LC537_PFHpA_00002	0.1207 g	Perfluoroheptanoic acid (PFHpA)	2.00022 mg/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00011	04/01/18	01/30/18	Methanol, Lot 090285	38.64 mL	LC537_PFHxS_00002	0.085 g	Perfluorohexanesulfonic acid (PFHxS)	2.00049 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00014	04/01/18	01/30/18	Methanol, Lot 090285	62.58 mL	LC537 PFNA_00002	0.065 g	Perfluorononanoic acid (PFNA)	1000.24 ug/mL
....LC537 PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00015	07/30/18	01/30/18	Methanol, Lot 090285	31 mL	LC537 PFOA_00003	0.0312 g	Perfluorooctanoic acid (PFOA)	1.00545 mg/mL
....LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00009	07/30/18	01/30/18	Methanol, Lot 090285	36 mL	LC537_PFOS_00003	0.0397 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
..LC537-SU_00059	07/30/18	01/30/18	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_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFDA	50 ug/mL
					(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L2_00021	04/01/18	02/05/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00027	320 uL	Perfluorobutanesulfonic acid (PFBS)	20.0016 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.22264 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	6.66884 ng/mL
							Perfluorononanoic acid (PFNA)	4.44587 ng/mL
							Perfluorooctanoic acid (PFOA)	4.469 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	8.92684 ng/mL
					LC537-IS_00059	2 mL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00059	2 mL	13C2 PFDA	10 ng/mL
		13C2 PFHxA	10 ng/mL					

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LC537-HSP_00027	04/01/18	01/30/18	Methanol, Lot 141039	40000 uL	LC537SPIM_00026	555.6 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.915 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.802 ng/mL
							Perfluorononanoic acid (PFNA)	277.867 ng/mL
							Perfluorooctanoic acid (PFOA)	279.313 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	557.928 ng/mL
..LC537SPIM_00026	04/01/18	01/30/18	Methanol, Lot 104453	20000 uL	LC537-PFBS_00009	900 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00016	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0011 ug/mL
					LC537-PFHxS_00011	300 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0074 ug/mL
					LC537-PFNA_00014	400 uL	Perfluorononanoic acid (PFNA)	20.0048 ug/mL
					LC537-PFOA_00015	400 uL	Perfluorooctanoic acid (PFOA)	20.1089 ug/mL
					LC537-PFOS_00009	800 uL	Perfluorooctanesulfonic acid (PFOS)	40.1676 ug/mL
...LC537-PFBS_00009	04/01/18	01/30/18	Methanol, Lot 090285	48.7 mL	LC537_PFBS_00002	0.0974 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_00016	04/01/18	01/30/18	Methanol, Lot 090285	59.74 mL	LC537_PFHpA_00002	0.1207 g	Perfluoroheptanoic acid (PFHpA)	2.00022 mg/mL
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00011	04/01/18	01/30/18	Methanol, Lot 090285	38.64 mL	LC537_PFHxS_00002	0.085 g	Perfluorohexanesulfonic acid (PFHxS)	2.00049 mg/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00014	04/01/18	01/30/18	Methanol, Lot 090285	62.58 mL	LC537 PFNA_00002	0.065 g	Perfluorononanoic acid (PFNA)	1000.24 ug/mL
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00015	07/30/18	01/30/18	Methanol, Lot 090285	31 mL	LC537 PFOA_00003	0.0312 g	Perfluorooctanoic acid (PFOA)	1.00545 mg/mL
....LC537 PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00009	07/30/18	01/30/18	Methanol, Lot 090285	36 mL	LC537_PFOS_00003	0.0397 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
....LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00059	07/30/18	01/30/18	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)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00059	07/30/18	01/30/18	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_00015	60 uL	13C2 PFHxA	0.1 ug/mL
...LCMPFHxA_00015	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFDA	50 ug/mL
					(Purchased Reagent)		13C2 PFHxA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-L3_00024	04/01/18	02/05/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00027	720 uL	Perfluorobutanesulfonic acid (PFBS)	45.0036 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5.00094 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	15.0049 ng/mL
							Perfluorononanoic acid (PFNA)	10.0032 ng/mL
							Perfluorooctanoic acid (PFOA)	10.0553 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.0854 ng/mL
					LC537-IS_00059	2 mL	13C2-PFOA	10 ng/mL
					LC537-SU_00059	2 mL	13C4 PFOS	28.68 ng/mL
							13C2 PFDA	10 ng/mL
LC537-HSP_00027	04/01/18	01/30/18	Methanol, Lot 141039	40000 uL	LC537SPIM_00026	555.6 uL	13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.915 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.802 ng/mL
							Perfluorononanoic acid (PFNA)	277.867 ng/mL
							Perfluorooctanoic acid (PFOA)	279.313 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	557.928 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
							Perfluoroheptanoic acid (PFHpA)	10.0011 ug/mL
LC537SPIM_00026	04/01/18	01/30/18	Methanol, Lot 104453	20000 uL	LC537-PFBS_00009	900 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0074 ug/mL
							Perfluorononanoic acid (PFNA)	20.0048 ug/mL
							Perfluorooctanoic acid (PFOA)	20.1089 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	40.1676 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
							Perfluoroheptanoic acid (PFHpA)	2.00022 mg/mL
LC537-PFBS_00009	04/01/18	01/30/18	Methanol, Lot 090285	48.7 mL	LC537-PFBS_00002	0.0974 g	Perfluorohexanesulfonic acid (PFHxS)	2.00049 mg/mL
							Perfluorooctanoic acid (PFOA)	1.00545 mg/mL
							Perfluorooctanesulfonic acid (PFOS)	0.999 g/g
							Perfluorobutanesulfonic acid (PFBS)	1 g/g
							Perfluoroheptanoic acid (PFHpA)	0.99 g/g
LC537-PFHpA_00016	04/01/18	01/30/18	Methanol, Lot 090285	59.74 mL	LC537-PFHpA_00002	0.1207 g	Perfluorohexanesulfonic acid (PFHxS)	2.00049 mg/mL
							Perfluorononanoic acid (PFNA)	1000.24 ug/mL
							Perfluorooctanoic acid (PFOA)	0.963 g/g
							Perfluorooctanesulfonic acid (PFOS)	0.9094 g/g
LC537-PFHS_00011	04/01/18	01/30/18	Methanol, Lot 090285	38.64 mL	LC537-PFHS_00002	0.085 g	Perfluorobutanesulfonic acid (PFBS)	1 g/g
							Perfluoroheptanoic acid (PFHpA)	0.99 g/g
							Perfluorohexanesulfonic acid (PFHxS)	2.00049 mg/mL
LC537-PFOS_00009	04/01/18	01/30/18	Methanol, Lot 090285	48.7 mL	LC537-PFOS_00002	0.0974 g	Perfluorobutanesulfonic acid (PFBS)	1 g/g
							Perfluoroheptanoic acid (PFHpA)	0.99 g/g
LC537-PFNA_00014	04/01/18	01/30/18	Methanol, Lot 090285	62.58 mL	LC537-PFNA_00002	0.065 g	Perfluorobutanesulfonic acid (PFBS)	1 g/g
							Perfluoroheptanoic acid (PFHpA)	0.99 g/g
LC537-PFOA_00015	07/30/18	01/30/18	Methanol, Lot 090285	31 mL	LC537-PFOA_00003	0.0312 g	Perfluorobutanesulfonic acid (PFBS)	1 g/g
							Perfluoroheptanoic acid (PFHpA)	0.99 g/g
LC537-PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC537-PFOS_00009	07/30/18	01/30/18	Methanol, Lot 090285	36 mL	LC537_PFOS_00003	0.0397 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
...LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00059	07/30/18	01/30/18	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)		13C4 PFOS	0.2868 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	50 ug/mL
.LC537-SU_00059	07/30/18	01/30/18	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_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFDA	0.1 ug/mL
					(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L4_00021	04/01/18	02/15/18	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00027	360 uL	Perfluorobutanesulfonic acid (PFBS)	90.0072 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10.0019 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	30.0098 ng/mL
							Perfluorononanoic acid (PFNA)	20.0064 ng/mL
							Perfluorooctanoic acid (PFOA)	20.1105 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	40.1708 ng/mL
					LC537-IS_00059	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00059	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00027	04/01/18	01/30/18	Methanol, Lot 141039	40000 uL	LC537SPIM_00026	555.6 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.915 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.802 ng/mL
							Perfluorononanoic acid (PFNA)	277.867 ng/mL
							Perfluorooctanoic acid (PFOA)	279.313 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	557.928 ng/mL
..LC537SPIM_00026	04/01/18	01/30/18	Methanol, Lot 104453	20000 uL	LC537-PFBS_00009	900 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00016	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0011 ug/mL
					LC537-PFHxS_00011	300 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0074 ug/mL
					LC537-PFNA_00014	400 uL	Perfluorononanoic acid (PFNA)	20.0048 ug/mL
					LC537-PFOA_00015	400 uL	Perfluorooctanoic acid (PFOA)	20.1089 ug/mL
					LC537-PFOS_00009	800 uL	Perfluorooctanesulfonic acid (PFOS)	40.1676 ug/mL
...LC537-PFBS_00009	04/01/18	01/30/18	Methanol, Lot 090285	48.7 mL	LC537_PFBS_00002	0.0974 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

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_00016	04/01/18	01/30/18	Methanol, Lot 090285	59.74 mL	LC537_PFHpA_00002	0.1207 g	Perfluoroheptanoic acid (PFHpA)	2.00022 mg/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00011	04/01/18	01/30/18	Methanol, Lot 090285	38.64 mL	LC537_PFHxS_00002	0.085 g	Perfluorohexanesulfonic acid (PFHxS)	2.00049 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00014	04/01/18	01/30/18	Methanol, Lot 090285	62.58 mL	LC537_PFNA_00002	0.065 g	Perfluorononanoic acid (PFNA)	1000.24 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00015	07/30/18	01/30/18	Methanol, Lot 090285	31 mL	LC537_PFOA_00003	0.0312 g	Perfluorooctanoic acid (PFOA)	1.00545 mg/mL
....LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00009	07/30/18	01/30/18	Methanol, Lot 090285	36 mL	LC537_PFOS_00003	0.0397 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00059	07/30/18	01/30/18	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_00059	07/30/18	01/30/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C4 PFOS	47.8 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			LCMPFHxA_00015	60 uL	13C2 PFDA	0.1 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	0.1 ug/mL
LC537-L5_00025	04/01/18	02/05/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00027	2160 uL	Perfluorobutanesulfonic acid (PFBS)	135.011 ng/mL
							Perfluoroheptanoic acid (PFHpA)	15.0028 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.0147 ng/mL
							Perfluorononanoic acid (PFNA)	30.0096 ng/mL
							Perfluorooctanoic acid (PFOA)	30.1658 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	60.2562 ng/mL
					LC537-IS_00059	2 mL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00059	2 mL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00027	04/01/18	01/30/18	Methanol, Lot 141039	40000 uL	LC537SPIM_00026	555.6 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
						Perfluoroheptanoic acid (PFHpA)	138.915 ng/mL	
						Perfluorohexanesulfonic acid (PFHxS)	416.802 ng/mL	
						Perfluorononanoic acid (PFNA)	277.867 ng/mL	
						Perfluorooctanoic acid (PFOA)	279.313 ng/mL	

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC537SPIM_00026	04/01/18	01/30/18	Methanol, Lot 104453	20000 uL	LC537-PFBS_00009	900 uL	Perfluorooctanesulfonic acid (PFOS)	557.928 ng/mL
					LC537-PFHpA_00016	100 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHxS_00011	300 uL	Perfluoroheptanoic acid (PFHpA)	10.0011 ug/mL
					LC537-PFNA_00014	400 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0074 ug/mL
					LC537-PFOA_00015	400 uL	Perfluorononanoic acid (PFNA)	20.0048 ug/mL
					LC537-PFOS_00009	800 uL	Perfluorooctanoic acid (PFOA)	20.1089 ug/mL
...LC537-PFBS_00009	04/01/18	01/30/18	Methanol, Lot 090285	48.7 mL	LC537_PFBS_00002	0.0974 g	Perfluorooctanesulfonic acid (PFOS)	40.1676 ug/mL
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
...LC537-PFHpA_00016	04/01/18	01/30/18	Methanol, Lot 090285	59.74 mL	LC537_PFHpA_00002	0.1207 g	Perfluoroheptanoic acid (PFHpA)	1 g/g
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	2.00022 mg/mL
...LC537-PFHxS_00011	04/01/18	01/30/18	Methanol, Lot 090285	38.64 mL	LC537_PFHxS_00002	0.085 g	Perfluoroheptanoic acid (PFHpA)	0.99 g/g
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	2.00049 mg/mL
...LC537-PFNA_00014	04/01/18	01/30/18	Methanol, Lot 090285	62.58 mL	LC537 PFNA_00002	0.065 g	Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	1000.24 ug/mL
...LC537-PFOA_00015	07/30/18	01/30/18	Methanol, Lot 090285	31 mL	LC537 PFOA_00003	0.0312 g	Perfluorononanoic acid (PFNA)	0.963 g/g
....LC537 PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	1.00545 mg/mL
...LC537-PFOS_00009	07/30/18	01/30/18	Methanol, Lot 090285	36 mL	LC537_PFOS_00003	0.0397 g	Perfluorooctanoic acid (PFOA)	0.999 g/g
....LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
..LC537-IS_00059	07/30/18	01/30/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		LCMPFOS_00021	180 uL	13C2-PFOA	0.1 ug/mL
..LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	0.2868 ug/mL
..LC537-SU_00059	07/30/18	01/30/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	50 ug/mL
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		LCMPFHxA_00015	60 uL	13C4 PFOS	47.8 ug/mL
..LCMPFHxA_00015	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFDA	0.1 ug/mL
LC537-L6_00021	04/01/18	02/15/18	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00027	720 uL	13C2 PFDA	0.1 ug/mL
							13C2 PFHxA	0.1 ug/mL
							13C2 PFDA	50 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	180.014 ng/mL
							Perfluoroheptanoic acid (PFHpA)	20.0038 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	60.0196 ng/mL
							Perfluorononanoic acid (PFNA)	40.0128 ng/mL
							Perfluorooctanoic acid (PFOA)	40.221 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	80.3416 ng/mL
					LC537-IS_00059	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00059	500 uL	13C2 PFDA	10 ng/mL
.LC537-HSP_00027	04/01/18	01/30/18	Methanol, Lot 141039	40000 uL	LC537SPIM_00026	555.6 uL	13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.915 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.802 ng/mL
							Perfluorononanoic acid (PFNA)	277.867 ng/mL
							Perfluorooctanoic acid (PFOA)	279.313 ng/mL
..LC537SPIM_00026	04/01/18	01/30/18	Methanol, Lot 104453	20000 uL	LC537-PFBS_00009	900 uL	Perfluorooctanesulfonic acid (PFOS)	557.928 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
							Perfluoroheptanoic acid (PFHpA)	10.0011 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	30.0074 ug/mL
							Perfluorononanoic acid (PFNA)	20.0048 ug/mL
							Perfluorooctanoic acid (PFOA)	20.1089 ug/mL
...LC537-PFBS_00009	04/01/18	01/30/18	Methanol, Lot 090285	48.7 mL	LC537-PFOS_00009	800 uL	Perfluorooctanesulfonic acid (PFOS)	40.1676 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
							Perfluoroheptanoic acid (PFHpA)	1 g/g
							Perfluorohexanesulfonic acid (PFHxS)	2.00022 mg/mL
							Perfluorononanoic acid (PFNA)	0.99 g/g
							Perfluorooctanoic acid (PFOA)	0.999 g/g
....LC537-PFHxA_00016	04/01/18	01/30/18	Methanol, Lot 090285	59.74 mL	LC537-PFHxA_00002	0.1207 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
							Perfluorobutanesulfonic acid (PFBS)	0.9106 g/g
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2868 ug/mL
							Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	47.8 ug/mL
....LC537-PFHxS_00011	04/01/18	01/30/18	Methanol, Lot 090285	38.64 mL	LC537-PFHxS_00002	0.085 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
							Perfluorobutanesulfonic acid (PFBS)	0.9106 g/g
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2868 ug/mL
							Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	47.8 ug/mL
....LC537-PFNA_00014	04/01/18	01/30/18	Methanol, Lot 090285	62.58 mL	LC537-PFNA_00002	0.065 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
							Perfluorobutanesulfonic acid (PFBS)	0.9106 g/g
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2868 ug/mL
							Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	47.8 ug/mL
....LC537-PFOA_00015	04/01/18	01/30/18	Methanol, Lot 090285	31 mL	LC537-PFOA_00003	0.0312 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
							Perfluorobutanesulfonic acid (PFBS)	0.9106 g/g
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2868 ug/mL
							Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	47.8 ug/mL
....LC537-PFOS_00009	07/30/18	01/30/18	Methanol, Lot 090285	36 mL	LC537-PFOS_00003	0.0397 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
							Perfluorobutanesulfonic acid (PFBS)	0.9106 g/g
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2868 ug/mL
							Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	47.8 ug/mL
....LC537-PFOS_00003	04/17/19		sigma alrich, Lot S2BE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
							Perfluorobutanesulfonic acid (PFBS)	0.9106 g/g
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2868 ug/mL
							Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	47.8 ug/mL
.LC537-IS_00059	07/30/18	01/30/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
							Perfluorobutanesulfonic acid (PFBS)	0.9106 g/g
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2868 ug/mL
							Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	47.8 ug/mL
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
							Perfluorobutanesulfonic acid (PFBS)	0.9106 g/g
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2868 ug/mL
							Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	47.8 ug/mL
..LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
							Perfluorobutanesulfonic acid (PFBS)	0.9106 g/g
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2868 ug/mL
							Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	47.8 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LC537-SU_00059	07/30/18	01/30/18	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 00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFHxA 00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFDA	50 ug/mL
					(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-MSP_00032	04/01/18	01/30/18	Methanol, Lot 141039	40000 uL	LC537SPIM_00026	333.4 uL	Perfluorobutane Sulfonate	750.15 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	750.15 ng/mL
							Perfluoroheptanoic acid (PFHpA)	83.3591 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	250.111 ng/mL
							Perfluorononanoic acid (PFNA)	166.74 ng/mL
							Perfluorooctanoic acid (PFOA)	167.608 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	334.797 ng/mL
.LC537SPIM_00026	04/01/18	01/30/18	Methanol, Lot 104453	20000 uL	LC537-PFBS_00009	900 uL	Perfluorobutane Sulfonate	90 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00016	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0011 ug/mL
					LC537-PFHxS_00011	300 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0074 ug/mL
					LC537-PFNA_00014	400 uL	Perfluorononanoic acid (PFNA)	20.0048 ug/mL
					LC537-PFOA_00015	400 uL	Perfluorooctanoic acid (PFOA)	20.1089 ug/mL
					LC537-PFOS_00009	800 uL	Perfluorooctanesulfonic acid (PFOS)	40.1676 ug/mL
..LC537-PFBS_00009	04/01/18	01/30/18	Methanol, Lot 090285	48.7 mL	LC537_PFBS_00002	0.0974 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_00016	04/01/18	01/30/18	Methanol, Lot 090285	59.74 mL	LC537_PFHpA_00002	0.1207 g	Perfluoroheptanoic acid (PFHpA)	2.00022 mg/mL
...LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
..LC537-PFHxS_00011	04/01/18	01/30/18	Methanol, Lot 090285	38.64 mL	LC537_PFHxS_00002	0.085 g	Perfluorohexanesulfonic acid (PFHxS)	2.00049 mg/mL
...LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
..LC537-PFNA_00014	04/01/18	01/30/18	Methanol, Lot 090285	62.58 mL	LC537 PFNA 00002	0.065 g	Perfluorononanoic acid (PFNA)	1000.24 ug/mL
...LC537 PFNA 00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
..LC537-PFOA_00015	07/30/18	01/30/18	Methanol, Lot 090285	31 mL	LC537 PFOA 00003	0.0312 g	Perfluorooctanoic acid (PFOA)	1.00545 mg/mL
...LC537 PFOA 00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
..LC537-PFOS_00009	07/30/18	01/30/18	Methanol, Lot 090285	36 mL	LC537_PFOS_00003	0.0397 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
...LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
LC537-SU_00062	08/27/18	02/27/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

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

SIGMA-ALDRICH®

sigma-aldrich.com

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:

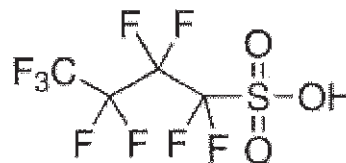
300.10 g/mol

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

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

Reagent

LC537_PFB2_00002

11.6.8.17 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_PFH_pA_00002

Certificate of Analysis

Product Name: PERFLUOROHEPTANOIC ACID
99 %
Product Number: 342041
Batch Number: BCBM2579V
Brand: Aldrich
CAS Number: 375-85-9
Formula: $\text{CF}_3(\text{CF}_2)_5\text{CO}_2\text{H}$
Formula Weight: 364.06
Quality Release Date: 06 DEC 2013
Recommended Retest Date: OCT 2018

PFH₇A

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



Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

Reagent

LC537_PFHpA2_00002

Certificate of analysis

r:6.13.17 SW

PFHe A

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

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

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ThermoFisher
SCIENTIFIC

Reagent

LC537_PFHxS_00002

r: 4/1/15 stw

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: TRIDECAFLUOROHXANE-1-SULFONIC ACID POTASSIUM SALT
Product Number: 50929
Batch Number: BCBL3545V
Brand: Aldrich
CAS Number: 3871-99-6
Formula: $C_{13}F_{27}KO_2S$
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

Claudia Geitner

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

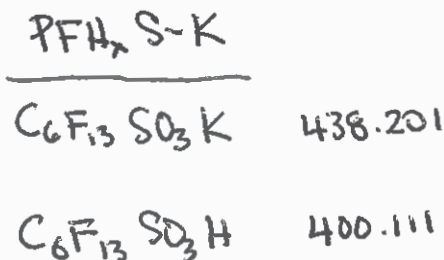


The Future is Now

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: $C_{13}F_{27}KO_2S$
 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)	$\geq 98.0\%$	100.4%



$$MW \text{ correction} = \frac{400.11}{438.201} = 0.91307 \quad \frac{PFH_2S}{\text{cas \# 355-46-4}}$$

$$\text{Purity} \times MW \text{ correction} = 90.9\%$$

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

Reagent

LC537_PFNA_00002

R: 4/1/15 SKV



Certificate of Analysis

Apr 2, 2015 (JST)

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

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

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

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

Customer service:

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

PFNA

Reagent

LC537_PFNA2_00002

12.6.14.17 SKW

SIGMA-ALDRICH

sigma-aldrich.com

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:

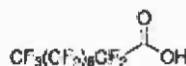
C₉H₁₇O₂

Formula Weight:

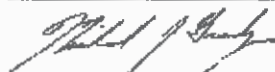
464.08 g/mol

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: PENTADECAFLUOROOCTANOIC 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 %)	$\geq 98.0\%$	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

17: 6/9/17 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_PFOS2_00002

R: 6.14.17 SKV

SIGMA-ALDRICH

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

Certificate of Analysis

Product Name: HEPTADEC AFLUORO OCTANESULFONIC ACID TETRAETHYLAMMONIUM SALT
98 %
Product Number: 365289
Batch Number: BCBQ0108V
Brand: Aldrich
CAS Number: 56773-42-3
Formula: $\text{CF}_3(\text{CF}_2)_6\text{CF}_2\text{SO}_3\text{N}(\text{C}_2\text{H}_5)_4$
Formula Weight: 629.37
Quality Release Date: 11 JUN 2015

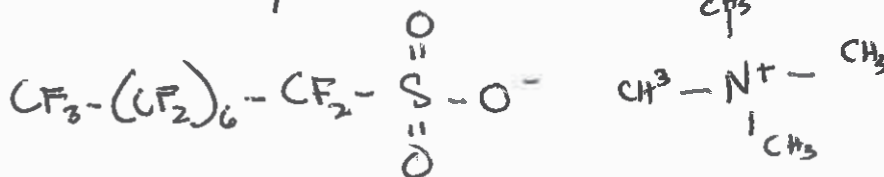
TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	WHITE TO OFF WHITE	OFF-WHITE
APPEARANCE (FORM)	POWDER OR POWDER WITH CHUNK(S)	POWDER
CARBON CONTENT	29.77 % - 31.29 %	29.97 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

$$\text{Purity \& mw correction} = 77.37\%$$



$$\begin{array}{r} \text{C}_8\text{F}_{17}\text{SO}_3^+\text{H} \\ \text{C} = 12.011 \quad 96.088 \\ \text{F} = 18.998 \quad 222.966 \\ \text{S} = 32.066 \quad 32.066 \\ \text{O} = 16.000 \quad 47.947 \\ \text{H} = 1.008 \quad 1.008 \\ \text{N} = 14.007 \quad - \\ \hline 500.125 \end{array}$$

$$\begin{array}{r} \text{C}_8\text{H}_{20}\text{N} \\ 96.088 \\ - \\ - \\ 20.60 \\ 14.007 \\ \hline 130.255 \end{array}$$

Reagent

LCM2PFOA_00007



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

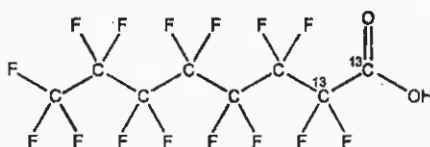
M2PFOA

LOT NUMBER:

M2PFOA0216

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

Not available

**MOLECULAR FORMULA:**¹³C₂¹²C₆HF₁₅O₂**CONCENTRATION:**

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

416.05

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:

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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:

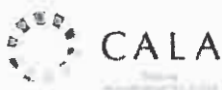
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

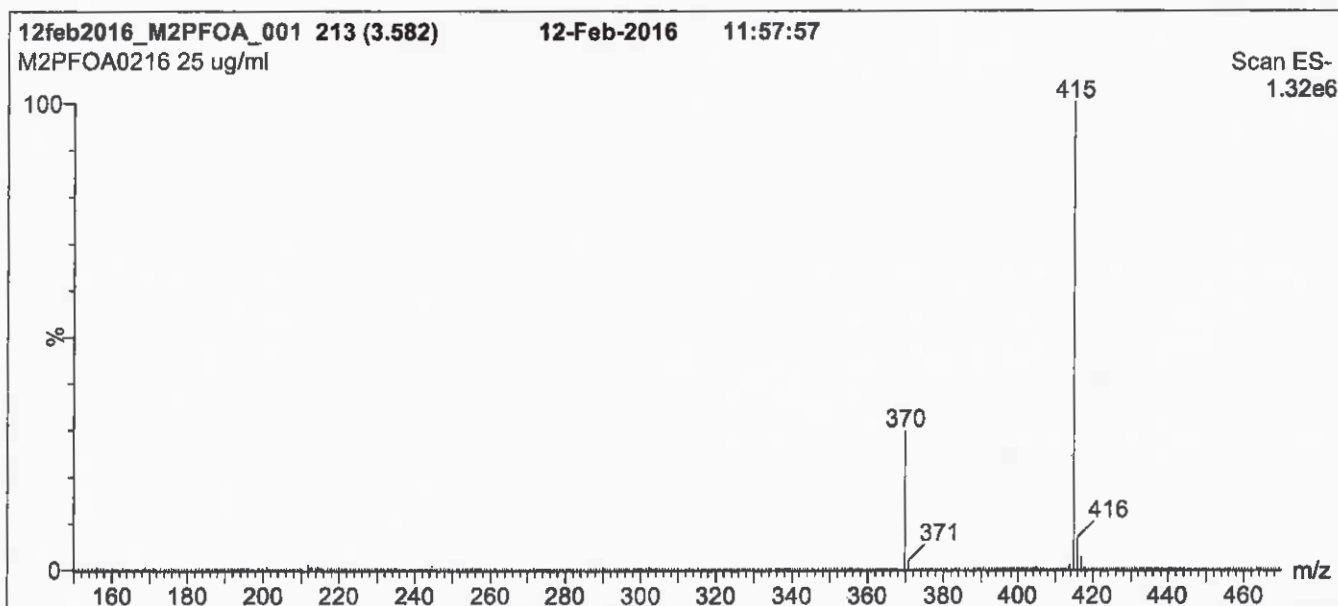
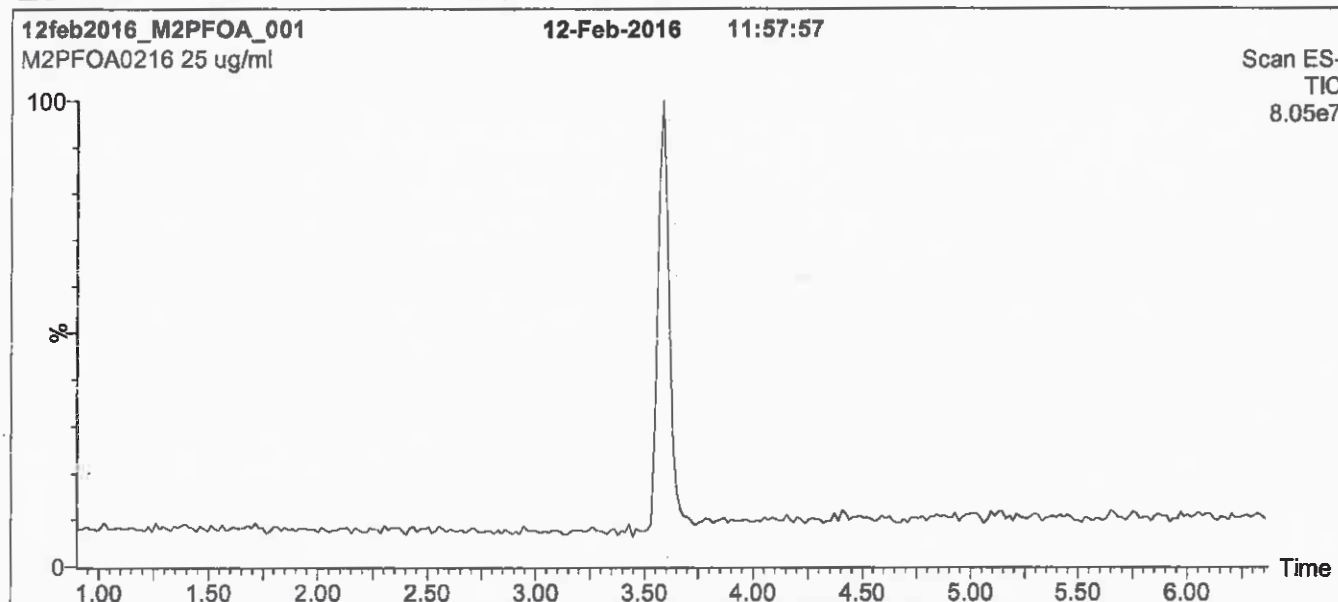
QUALITY MANAGEMENT:

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: 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

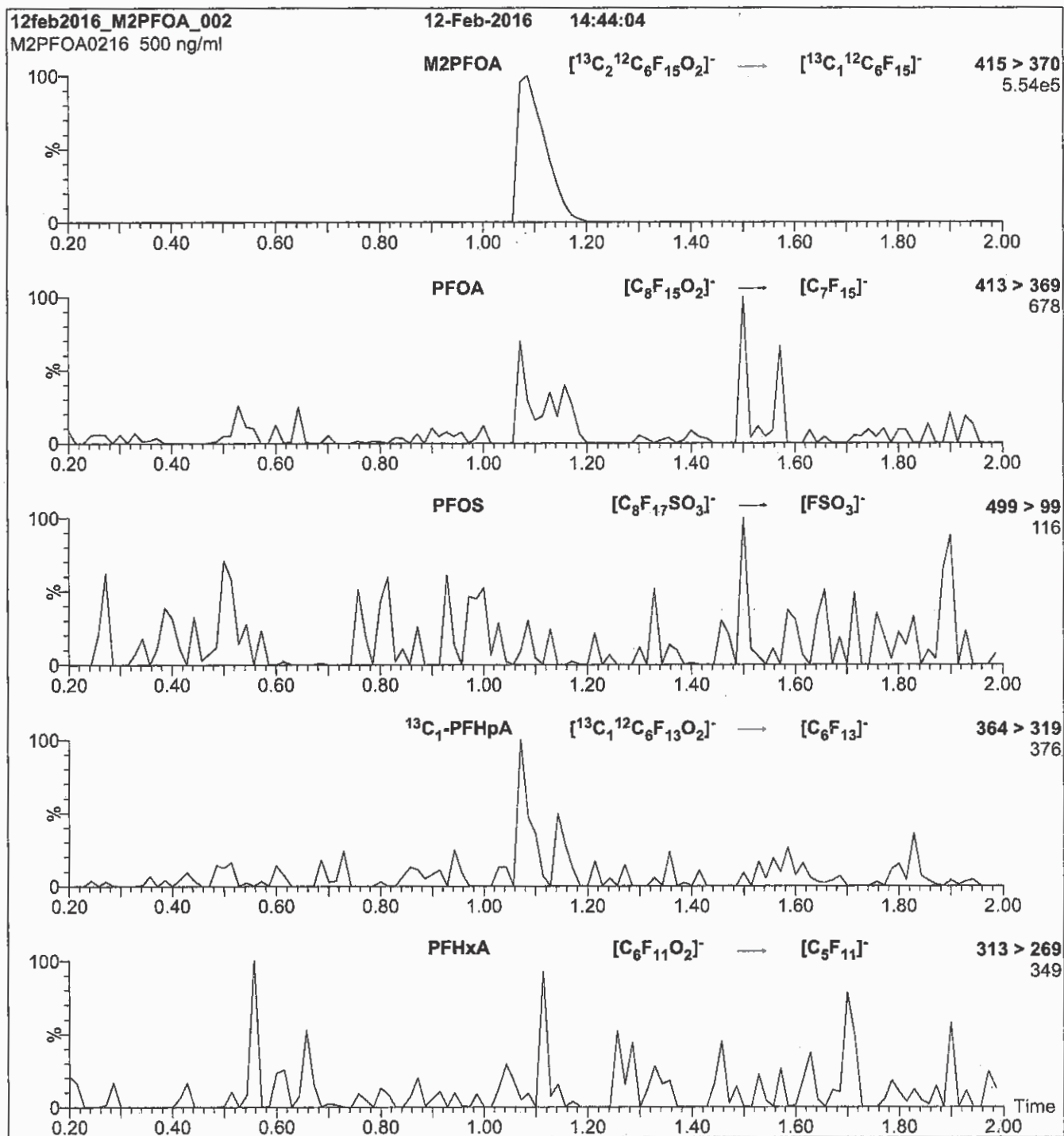
Flow: 300 μ l/min

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: LCMFDA_00012

Exp: 09/30/21 Prod: SBC

13C2-Perfluorodecanoic acid



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDA

COMPOUND:

Perfluoro-n-[1,2-¹³C₂]decanoic acid

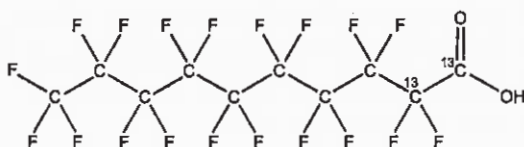
LOT NUMBER:

MPFDA0916

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

LAST TESTED: (mm/dd/yyyy)

09/30/2016

(1,2-¹³C₂)

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. Chittim

Date: 10/07/2016

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

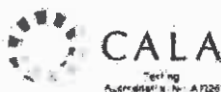
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

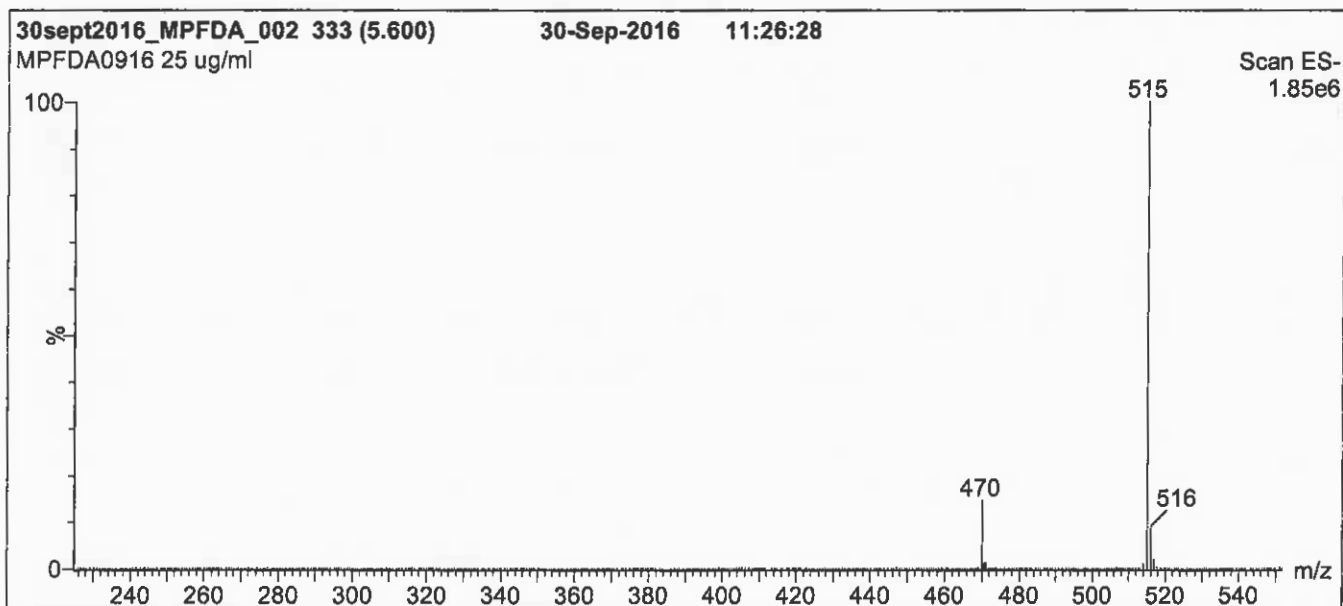
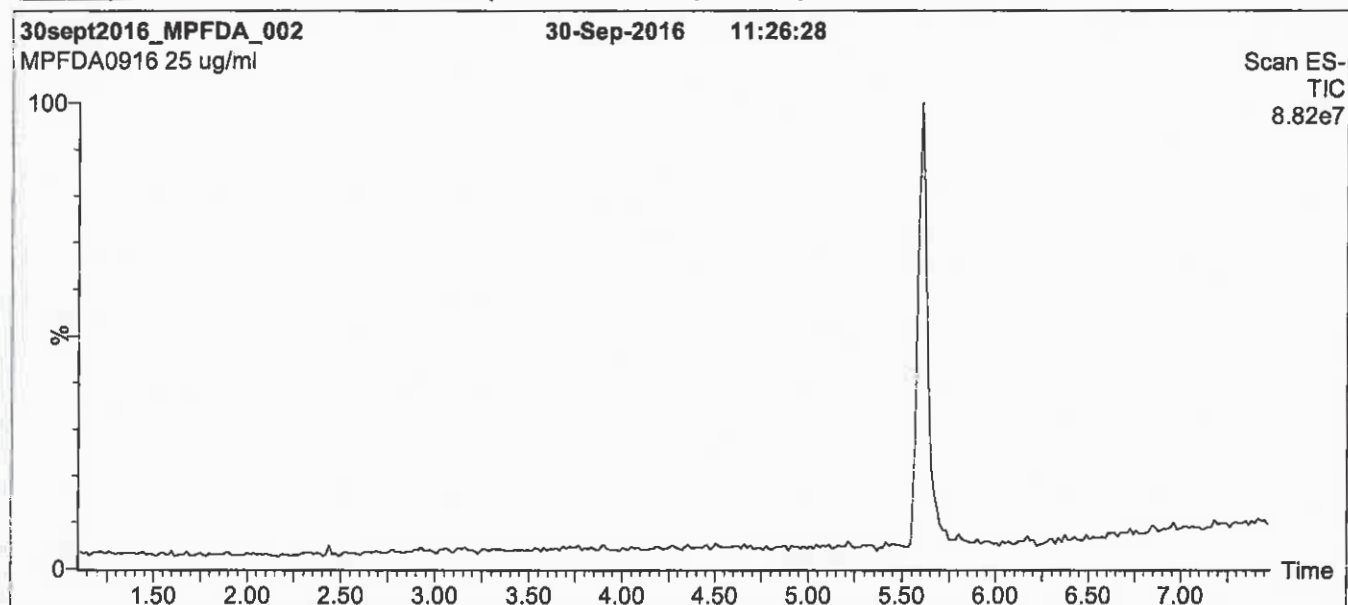
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

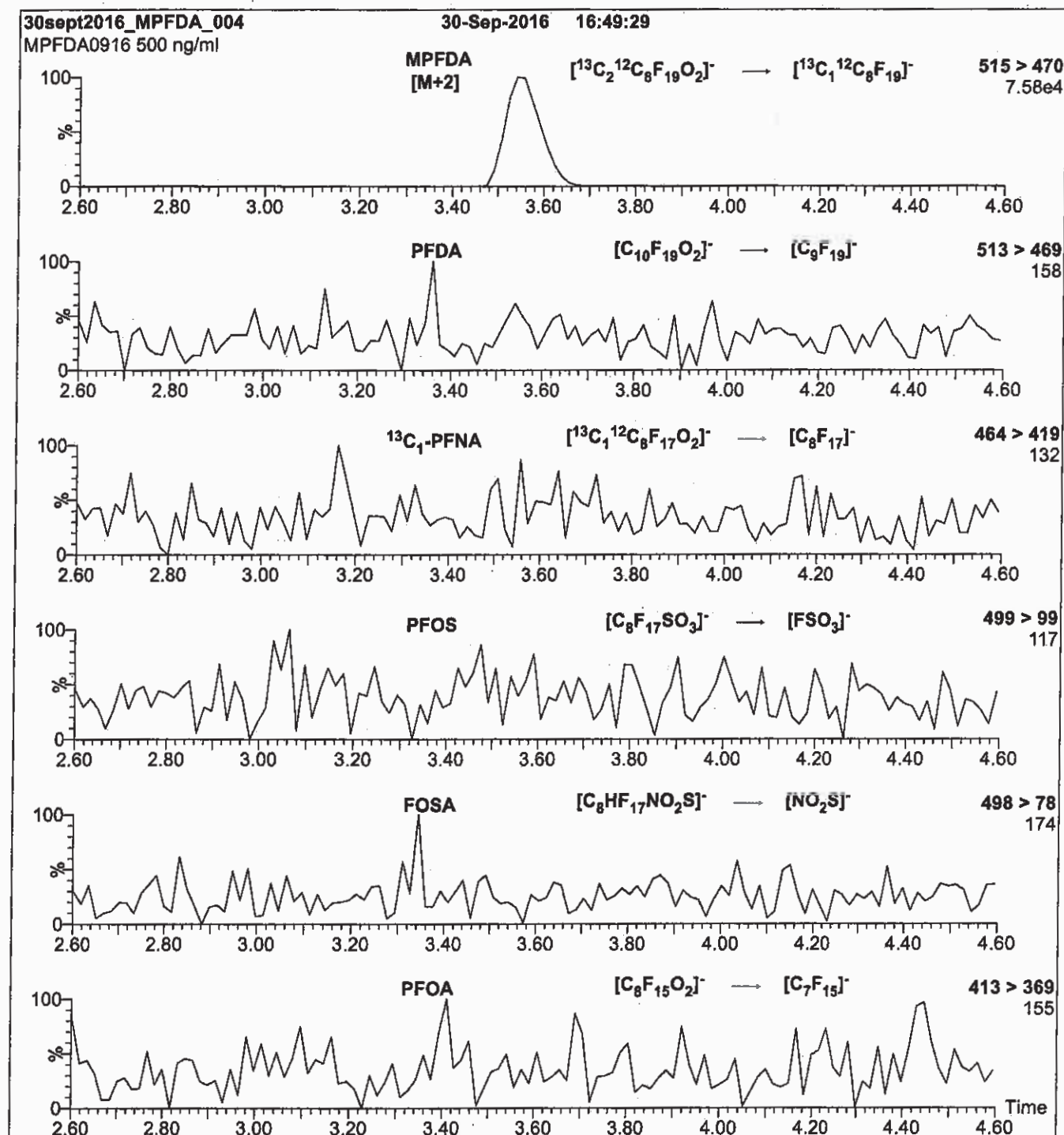
Flow: 300 μ l/min

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% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFHxA_00015

17: 5/6/17 SKJ



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%
LAST TESTED: (mm/dd/yyyy) 11/22/2016
EXPIRY DATE: (mm/dd/yyyy) 11/22/2021

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:
B.G. Chittim

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

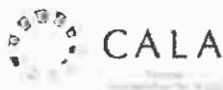
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

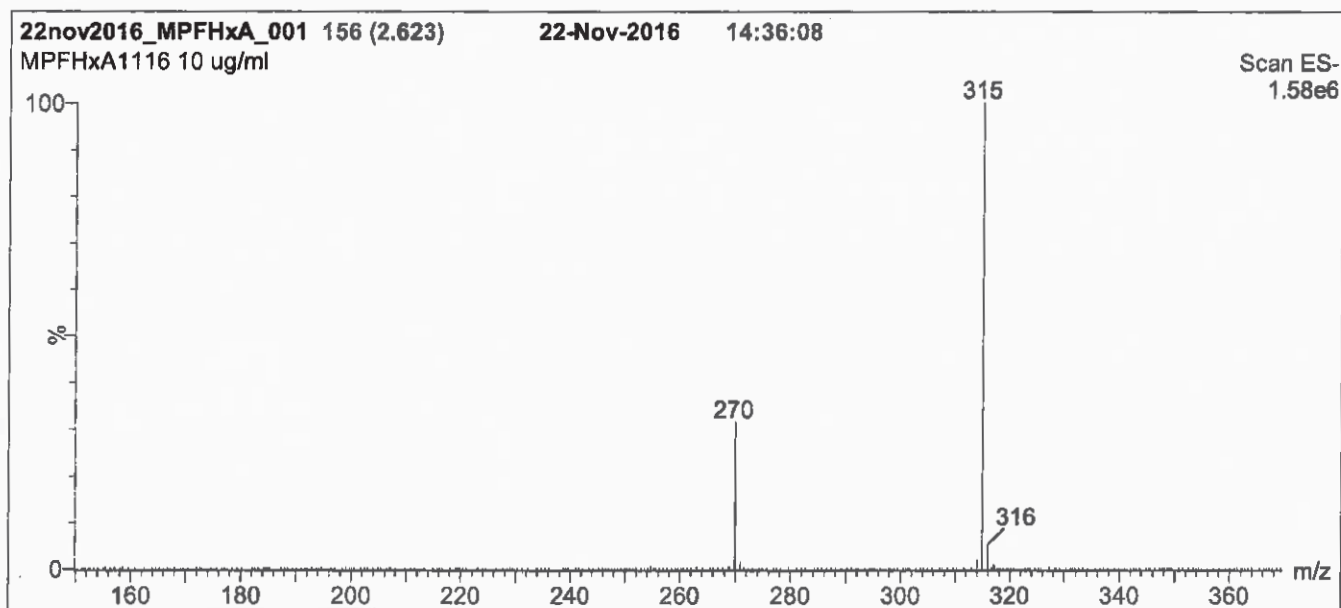
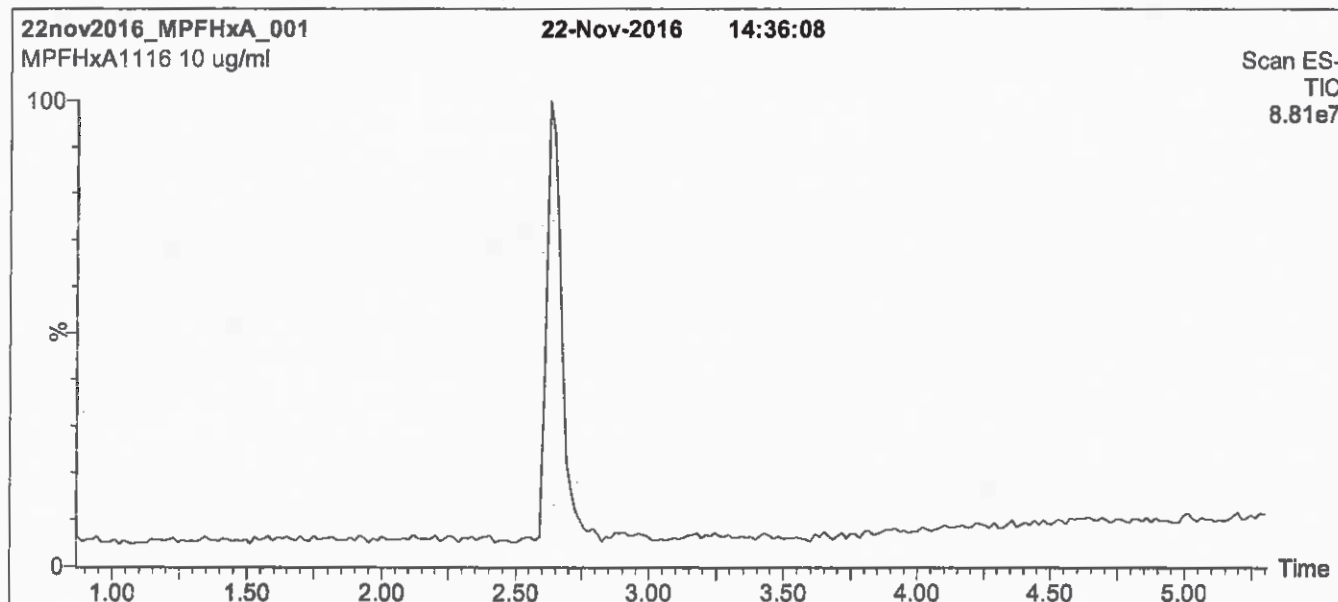
QUALITY MANAGEMENT:

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: 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

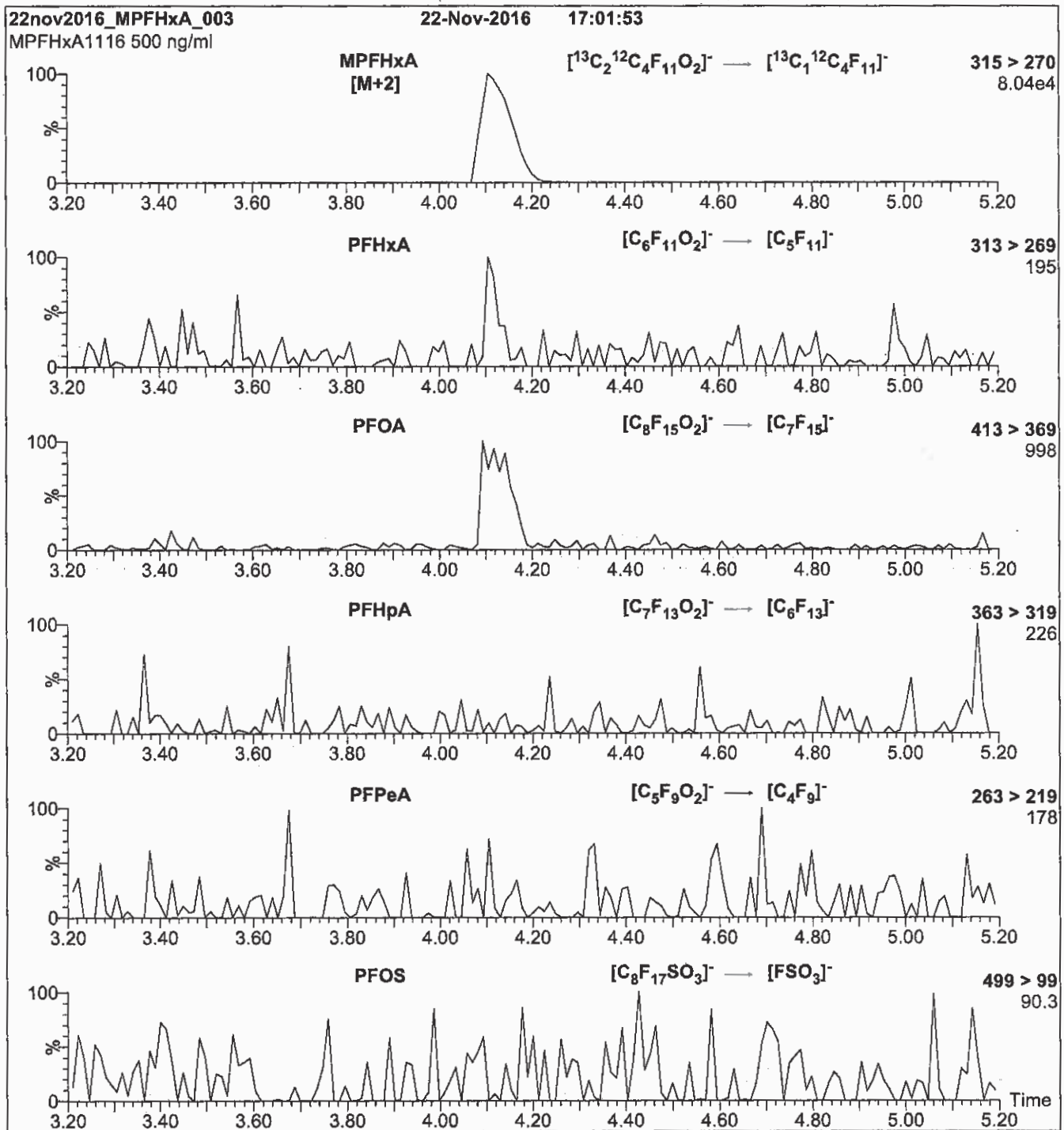
Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm
Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions over 0.5 min.
Time: 10 min

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_00021



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:**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)

12/12/2016

(1,2,3,4-¹³C₄)**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

INTENDED USE:

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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.

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

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

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$x_1, x_2, \dots, x_n$ on which it depends is:

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

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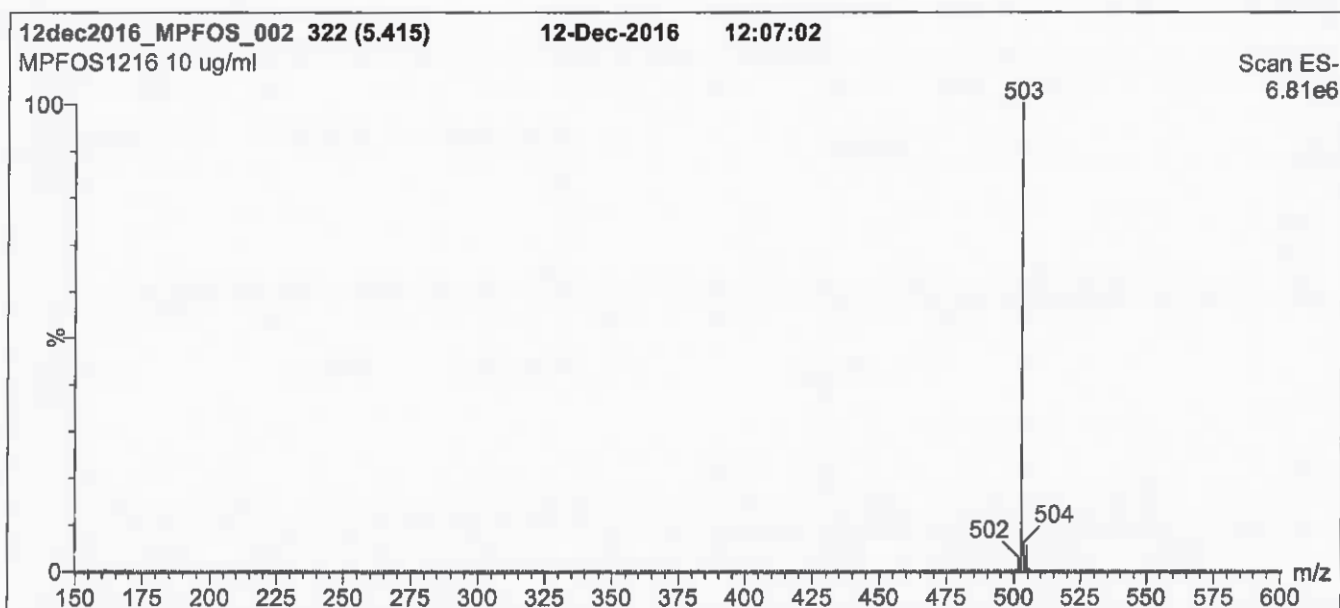
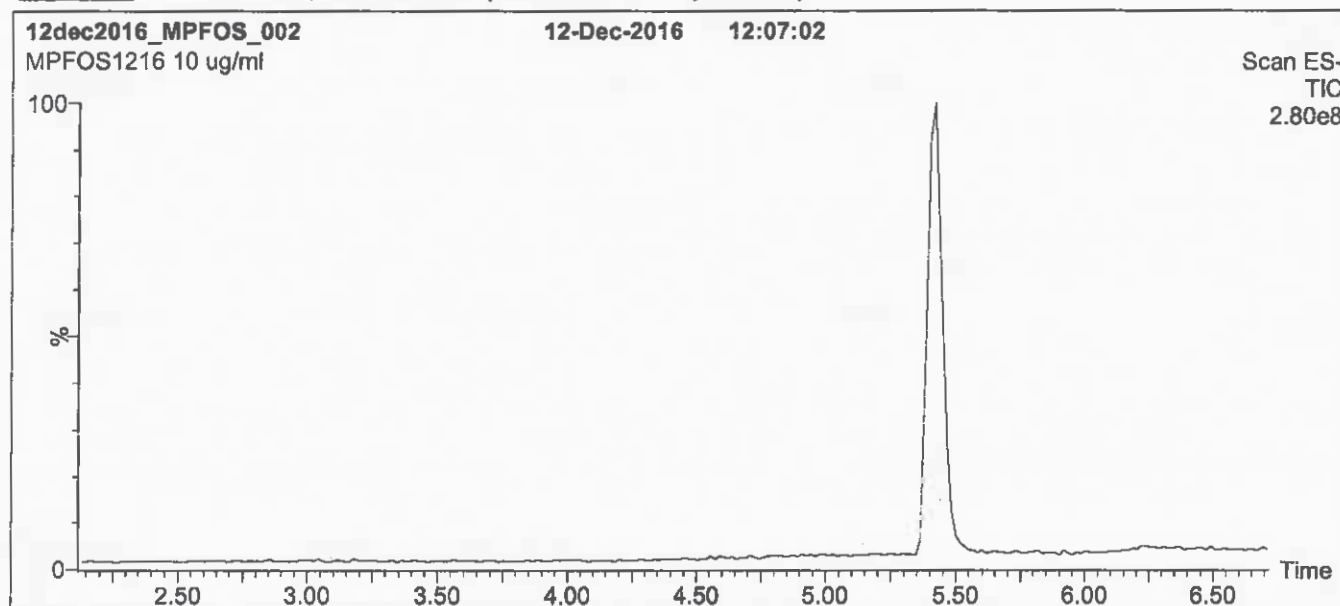
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Figure 1: MPFOS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

Start: 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

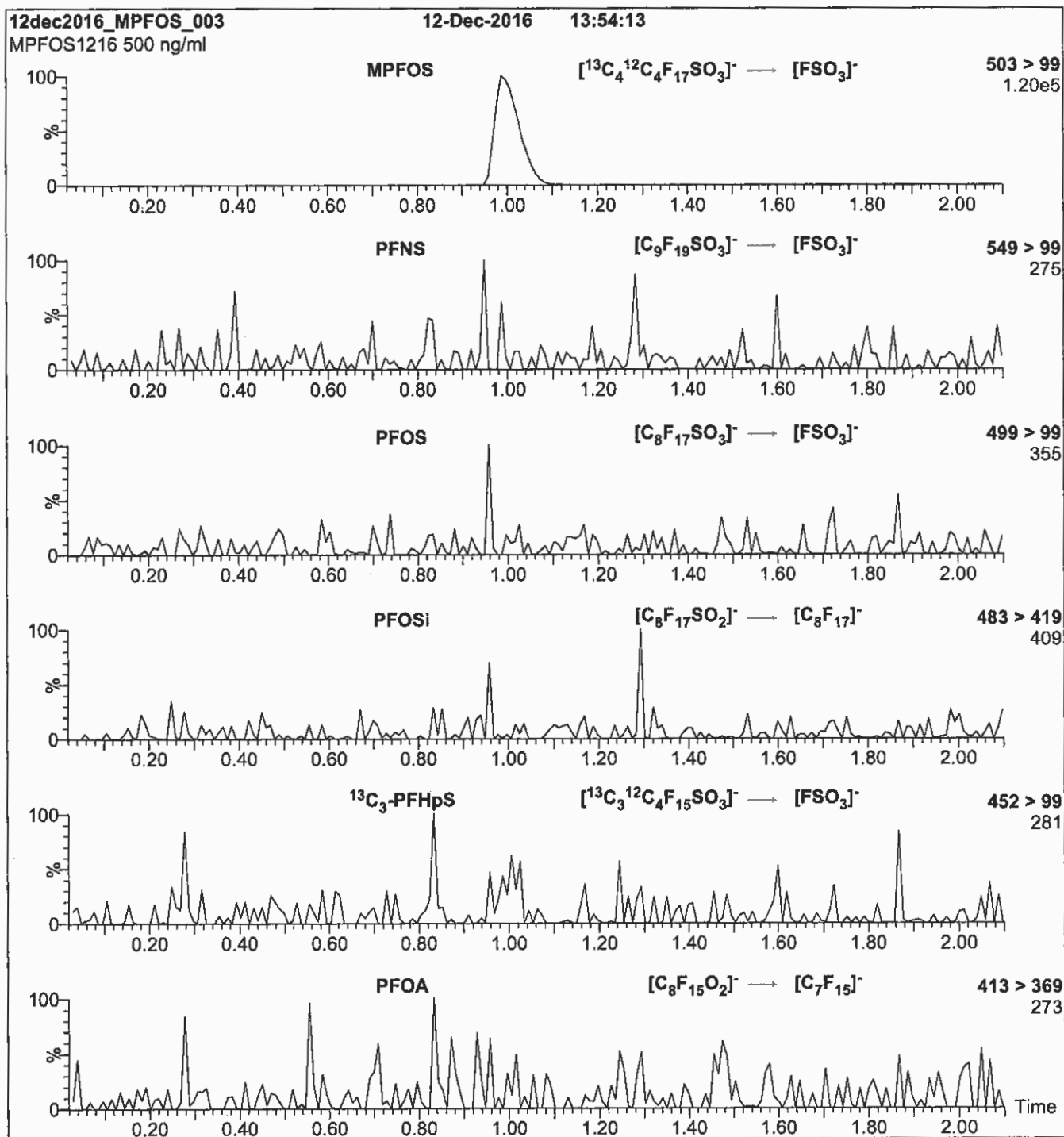
Flow: 300 μ l/min

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.: 320-36794-1

SDG No.: _____

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-030518-RW-055	320-36794-1	95	117
NAWC-030518-FRB-055	320-36794-2	93	101
NAWC-030518-RW-124	320-36794-3	94	110
NAWC-030518-FRB-124	320-36794-4	104	111
NAWC-030518-RW-201	320-36794-5	90	112
NAWC-030518-FRB-201	320-36794-6	103	112
NAWC-030518-RW-190	320-36794-7	97	112
NAWC-030518-FRB-190	320-36794-8	101	116
	MB 320-212343/1-A	102	108
	LCS 320-212343/2-A	91	109
NAWC-030518-RW-190 MS	320-36794-7 MS	87	112
NAWC-030518-RW-190 MSD	320-36794-7 MSD	95	107

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA

QC LIMITS
70-130
70-130

Column to be used to flag recovery values

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.03.15_537AAX_019.d
 Lab ID: LCS 320-212343/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	134	149	111	70-130	M
Perfluorooctanoic acid (PFOA)	67.0	71.9	107	70-130	
Perfluorononanoic acid (PFNA)	66.7	68.7	103	70-130	
Perfluorohexanesulfonic acid (PFHxS)	100	114	114	70-130	
Perfluoroheptanoic acid (PFHpA)	33.3	35.2	105	70-130	
Perfluorobutanesulfonic acid (PFBS)	300	271	90	70-130	

Column to be used to flag recovery and RPD values

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.03.15_537AAX_029.d
 Lab ID: 320-36794-7 MS Client ID: NAWC-030518-RW-190 MS

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	129	11 J	153	110	70-130	M
Perfluorooctanoic acid (PFOA)	64.8	12 J	83.0	110	70-130	
Perfluorononanoic acid (PFNA)	64.5	19 U	72.7	113	70-130	
Perfluorohexanesulfonic acid (PFHxS)	96.7	12 U	104	107	70-130	M
Perfluoroheptanoic acid (PFHpA)	32.2	3.5 J	38.8	110	70-130	
Perfluorobutanesulfonic acid (PFBS)	290	35 U	248	85	70-130	

Column to be used to flag recovery and RPD values

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.03.15_537AAX_030.d
 Lab ID: 320-36794-7 MSD Client ID: NAWC-030518-RW-190 MSD

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	122	147	111	4	30	70-130	M
Perfluorooctanoic acid (PFOA)	61.1	77.3	107	7	30	70-130	
Perfluorononanoic acid (PFNA)	60.8	66.3	109	9	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	91.2	105	115	1	30	70-130	
Perfluoroheptanoic acid (PFHpA)	30.4	35.7	106	8	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	274	283	103	13	30	70-130	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Lab File ID: 2018.03.15_537AAX_018.d Lab Sample ID: MB 320-212343/1-A
 Matrix: Water Date Extracted: 03/12/2018 07:09
 Instrument ID: A8_N Date Analyzed: 03/15/2018 22:34
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-212343/2-A	2018.03.15_537AAX_019.d	03/15/2018 22:38
NAWC-030518-RW-055	320-36794-1	2018.03.15_537AAX_020.d	03/15/2018 22:43
NAWC-030518-FRB-055	320-36794-2	2018.03.15_537AAX_021.d	03/15/2018 22:48
NAWC-030518-RW-124	320-36794-3	2018.03.15_537AAX_022.d	03/15/2018 22:52
NAWC-030518-FRB-124	320-36794-4	2018.03.15_537AAX_023.d	03/15/2018 22:57
NAWC-030518-RW-201	320-36794-5	2018.03.15_537AAX_024.d	03/15/2018 23:02
NAWC-030518-FRB-201	320-36794-6	2018.03.15_537AAX_025.d	03/15/2018 23:06
NAWC-030518-RW-190	320-36794-7	2018.03.15_537AAX_028.d	03/15/2018 23:20
NAWC-030518-RW-190 MS	320-36794-7 MS	2018.03.15_537AAX_029.d	03/15/2018 23:25
NAWC-030518-RW-190 MSD	320-36794-7 MSD	2018.03.15_537AAX_030.d	03/15/2018 23:30
NAWC-030518-FRB-190	320-36794-8	2018.03.15_537AAX_031.d	03/15/2018 23:34

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Instrument ID: A8_N Calibration Start Date: 03/15/2018 11:30
 GC Column: GeminiC18 3x100 ID: 3 (mm) Calibration End Date: 03/15/2018 11:53
 Calibration ID: 38167

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		936240	1.79	2723887	2.02		
UPPER LIMIT		1404360	2.29	4085831	2.52		
LOWER LIMIT		468120	1.29	1361944	1.52		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-213143/11		897894	1.79	2561754	2.02		
ICV 320-213143/13		885172	1.81	2569550	2.05		
CCV 320-213297/12 CCVIS		939380	1.80	2770557	2.03		
MB 320-212343/1-A		914267	1.78	2506093	2.01		
LCS 320-212343/2-A		948188	1.80	2549209	2.03		
320-36794-1	NAWC-030518-RW-055	952885	1.81	2609378	2.04		
320-36794-2	NAWC-030518-FRB-055	978146	1.82	2735043	2.00		
320-36794-3	NAWC-030518-RW-124	934535	1.80	2597022	2.03		
320-36794-4	NAWC-030518-FRB-124	942072	1.78	2599292	2.00		
320-36794-5	NAWC-030518-RW-201	951290	1.78	2713732	2.00		
320-36794-6	NAWC-030518-FRB-201	928357	1.79	2523021	2.02		
CCV 320-213297/22 CCVIS		931704	1.79	2735870	2.03		
CCV 320-213299/22 CCVIS		931704	1.79	2735870	2.03		
320-36794-7	NAWC-030518-RW-190	1104308	1.78	3172593	2.00		
320-36794-7 MS	NAWC-030518-RW-190 MS	946494	1.79	2804232	2.01		
320-36794-7 MSD	NAWC-030518-RW-190 MSD	950505	1.80	2664243	2.03		
320-36794-8	NAWC-030518-FRB-190	941171	1.78	2706073	2.01		
CCV 320-213299/28 CCVIS		958419	1.78	2710914	2.03		

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 50%-150% of internal standard area

RT Limit = $\pm$ 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.: 320-36794-1
 SDG No.: _____
 Sample No.: CCV 320-213297/12 Date Analyzed: 03/15/2018 22:24
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.03.15_537AAX_0 Heated Purge: (Y/N) N
 Calibration ID: 38167

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		939380	1.80	2770557	2.03		
UPPER LIMIT		1315132	2.30	3878780	2.53		
LOWER LIMIT		657566	1.30	1939390	1.53		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-212343/1-A		914267	1.78	2506093	2.01		
LCS 320-212343/2-A		948188	1.80	2549209	2.03		
320-36794-1	NAWC-030518-RW-055	952885	1.81	2609378	2.04		
320-36794-2	NAWC-030518-FRB-055	978146	1.82	2735043	2.00		
320-36794-3	NAWC-030518-RW-124	934535	1.80	2597022	2.03		
320-36794-4	NAWC-030518-FRB-124	942072	1.78	2599292	2.00		
320-36794-5	NAWC-030518-RW-201	951290	1.78	2713732	2.00		
320-36794-6	NAWC-030518-FRB-201	928357	1.79	2523021	2.02		

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area

RT Limit = $\pm$ 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.: 320-36794-1
 SDG No.: _____
 Sample No.: CCV 320-213297/22 Date Analyzed: 03/15/2018 23:11
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.03.15_537AAX_0 Heated Purge: (Y/N) N
 Calibration ID: 38167

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		931704	1.79	2735870	2.03		
UPPER LIMIT		1304386	2.29	3830218	2.53		
LOWER LIMIT		652193	1.29	1915109	1.53		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-212343/1-A		914267	1.78	2506093	2.01		
LCS 320-212343/2-A		948188	1.80	2549209	2.03		
320-36794-1	NAWC-030518-RW-055	952885	1.81	2609378	2.04		
320-36794-2	NAWC-030518-FRB-055	978146	1.82	2735043	2.00		
320-36794-3	NAWC-030518-RW-124	934535	1.80	2597022	2.03		
320-36794-4	NAWC-030518-FRB-124	942072	1.78	2599292	2.00		
320-36794-5	NAWC-030518-RW-201	951290	1.78	2713732	2.00		
320-36794-6	NAWC-030518-FRB-201	928357	1.79	2523021	2.02		

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area

RT Limit = $\pm$ 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.: 320-36794-1
 SDG No.: _____
 Sample No.: CCV 320-213299/22 Date Analyzed: 03/15/2018 23:11
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.03.15_537AAX_0 Heated Purge: (Y/N) N
 Calibration ID: 38167

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	931704	1.79	2735870	2.03		
UPPER LIMIT	1304386	2.29	3830218	2.53		
LOWER LIMIT	652193	1.29	1915109	1.53		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-36794-7	NAWC-030518-RW-190	1104308	1.78	3172593	2.00	
320-36794-7 MS	NAWC-030518-RW-190 MS	946494	1.79	2804232	2.01	
320-36794-7 MSD	NAWC-030518-RW-190 MSD	950505	1.80	2664243	2.03	
320-36794-8	NAWC-030518-FRB-190	941171	1.78	2706073	2.01	

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

Area Limit = 70%-140% of internal standard area
 RT Limit = $\pm$ 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.: 320-36794-1
 SDG No.: _____
 Sample No.: CCV 320-213299/28 Date Analyzed: 03/15/2018 23:39
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.03.15_537AAX_0 Heated Purge: (Y/N) N
 Calibration ID: 38167

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	958419	1.78	2710914	2.03		
UPPER LIMIT	1341787	2.28	3795280	2.53		
LOWER LIMIT	670893	1.28	1897640	1.53		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-36794-7	NAWC-030518-RW-190	1104308	1.78	3172593	2.00	
320-36794-7 MS	NAWC-030518-RW-190 MS	946494	1.79	2804232	2.01	
320-36794-7 MSD	NAWC-030518-RW-190 MSD	950505	1.80	2664243	2.03	
320-36794-8	NAWC-030518-FRB-190	941171	1.78	2706073	2.01	

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

Area Limit = 70%-140% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-RW-055</u>	Lab Sample ID: <u>320-36794-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_020.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 10:10</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>256.9(mL)</u>	Date Analyzed: <u>03/15/2018 22:43</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213297</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U M	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	4.3	J	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U M	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U M	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	117		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_020.d
 Lims ID: 320-36794-A-1-A
 Client ID: NAWC-030518-RW-055
 Sample Type: Client
 Inject. Date: 15-Mar-2018 22:43:26 ALS Bottle#: 12 Worklist Smp#: 16
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-36794-a-1
 Misc. Info.: Plate: 1 Rack: 6
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK015

First Level Reviewer: barnettj

Date: 16-Mar-2018 10:17:52

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.373	0.008	1.000	28255	0.2777		21.8	M
298.90 > 99.00	1.381	1.373	0.008	1.000	25218		1.12(0.00-0.00)	46.8	M
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.495	0.0	1.000	992790	9.54		12400	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.631	1.624	0.007	1.000	27286	0.1891		20.5	M
* 6 13C2-PFOA									
415.00 > 370.00	1.806	1.798	0.008		952885	10.0		7491	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.806	1.798	0.008	1.000	98472	1.10		3.1	
413.00 > 169.00	1.806	1.798	0.008	1.000	48110		2.05(0.00-0.00)	51.4	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.041	2.026	0.015	1.000	51273	0.5948		20.3	Ma
499.00 > 99.00	2.041	2.026	0.015	1.000	9536		5.38(0.00-0.00)	6.5	M
* 7 13C4 PFOS									
503.00 > 80.00	2.041	2.026	0.015		2609378	28.7		2920	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.238	2.231	0.007	1.000	697906	11.7		3064	

QC Flag Legend

Review Flags

M - Manually Integrated

a - User Assigned ID

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_020.d

Injection Date: 15-Mar-2018 22:43:26

Instrument ID: A8_N

Lims ID: 320-36794-A-1-A

Lab Sample ID: 320-36794-1

Client ID: NAWC-030518-RW-055

Operator ID: SACINSTLCMS01

ALS Bottle#: 12

Worklist Smp#: 16

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

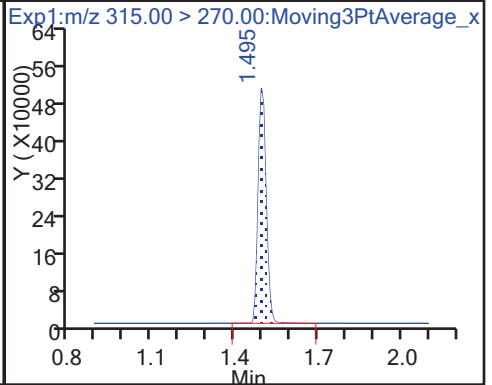
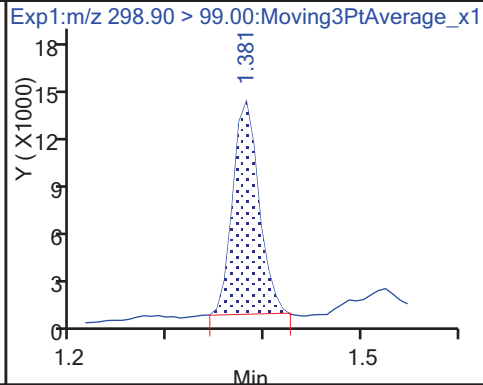
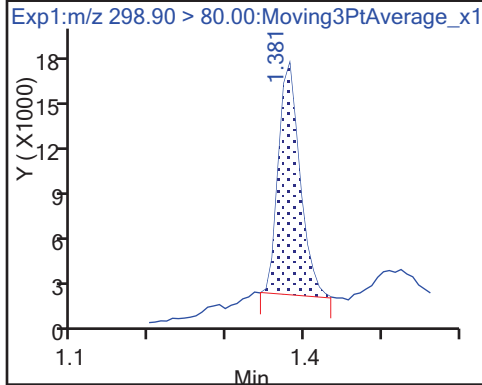
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (M)

1 Perfluorobutanesulfonic acid (M)

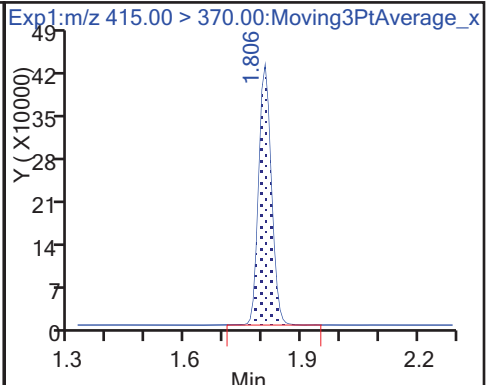
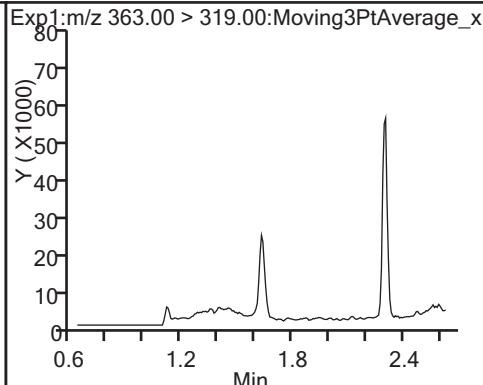
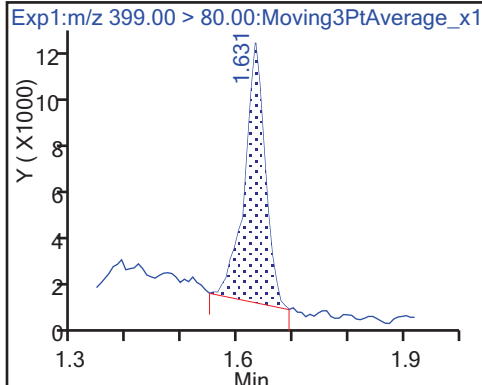
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (M)

4 Perfluoroheptanoic acid (ND)

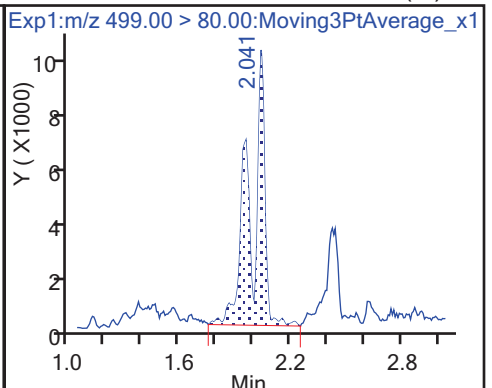
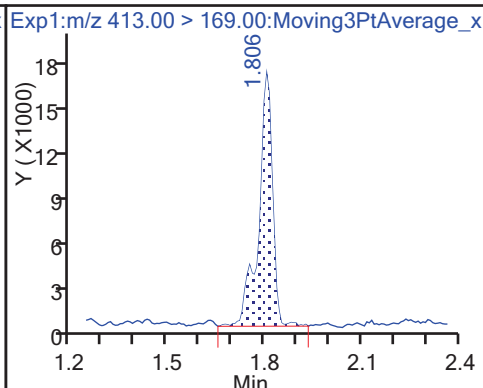
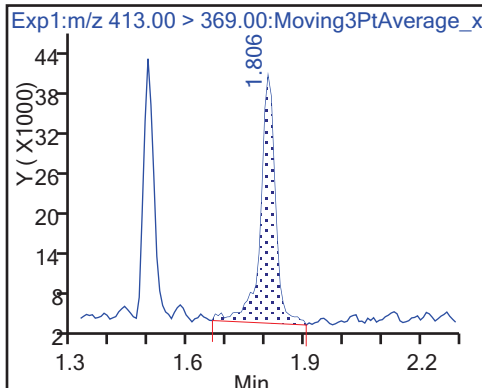
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

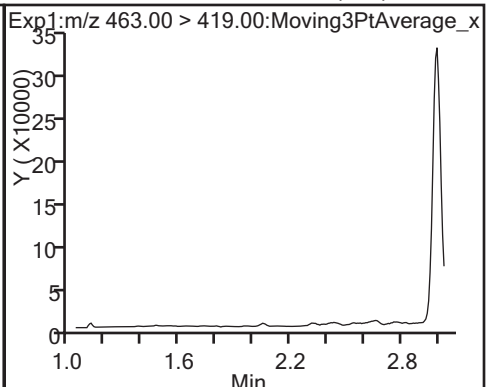
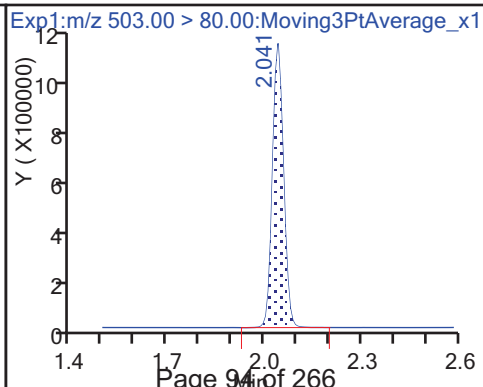
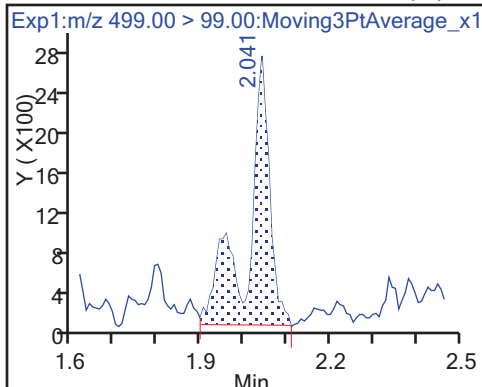
8 Perfluorooctane sulfonic acid (M)



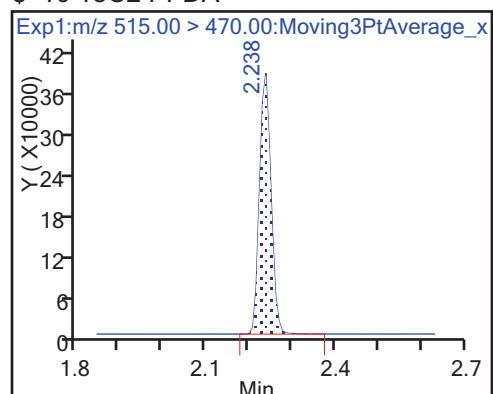
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_020.d
Lims ID: 320-36794-A-1-A
Client ID: NAWC-030518-RW-055
Sample Type: Client
Inject. Date: 15-Mar-2018 22:43:26 ALS Bottle#: 12 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-36794-a-1
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d
Column 1 : Det: EXP1
Process Host: XAWRK015

First Level Reviewer: barnettj

Date: 16-Mar-2018 10:17:52

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.54	95.43
\$ 10 13C2 PFDA	10.0	11.7	116.83

TestAmerica Sacramento

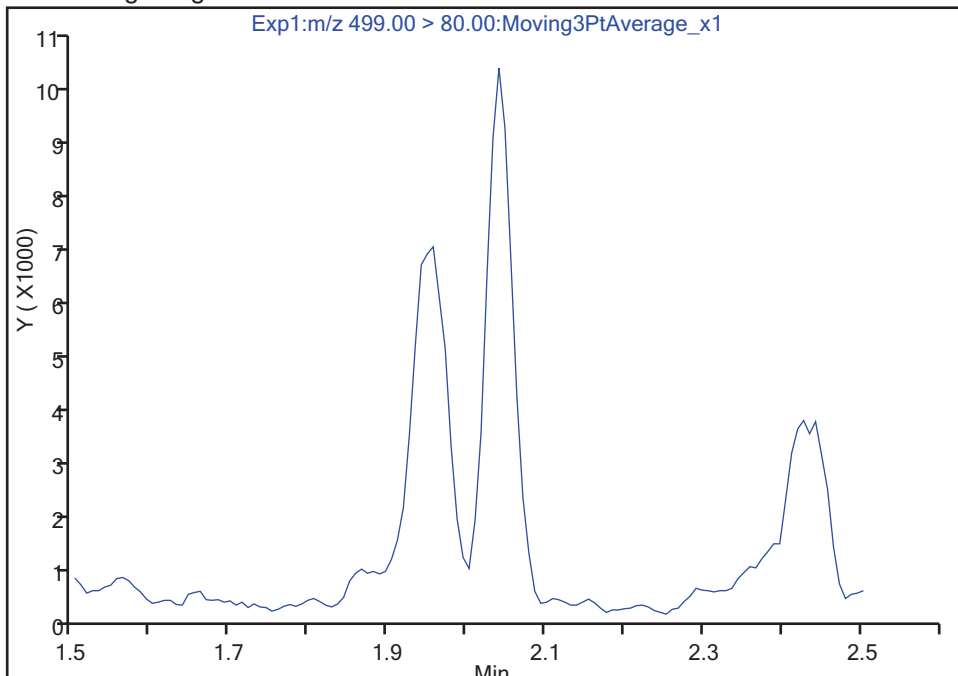
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_020.d
Injection Date: 15-Mar-2018 22:43:26 Instrument ID: A8_N
Lims ID: 320-36794-A-1-A Lab Sample ID: 320-36794-1
Client ID: NAWC-030518-RW-055
Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: 16
Injection Vol: 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

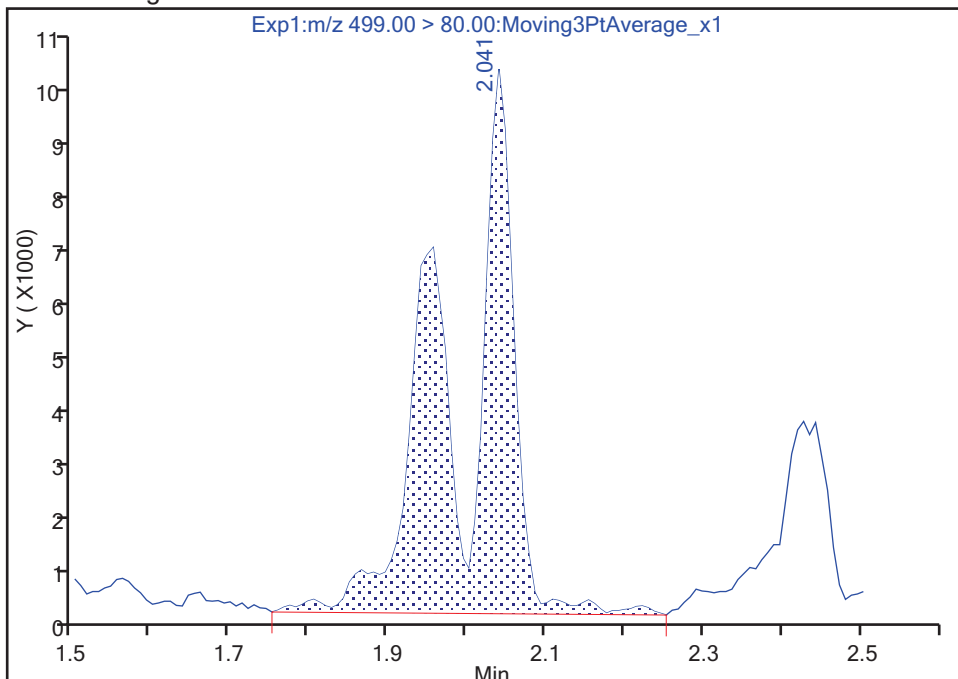
Not Detected
Expected RT: 2.03

Processing Integration Results



RT: 2.04
Area: 51273
Amount: 0.594840
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 16-Mar-2018 10:17:32

Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

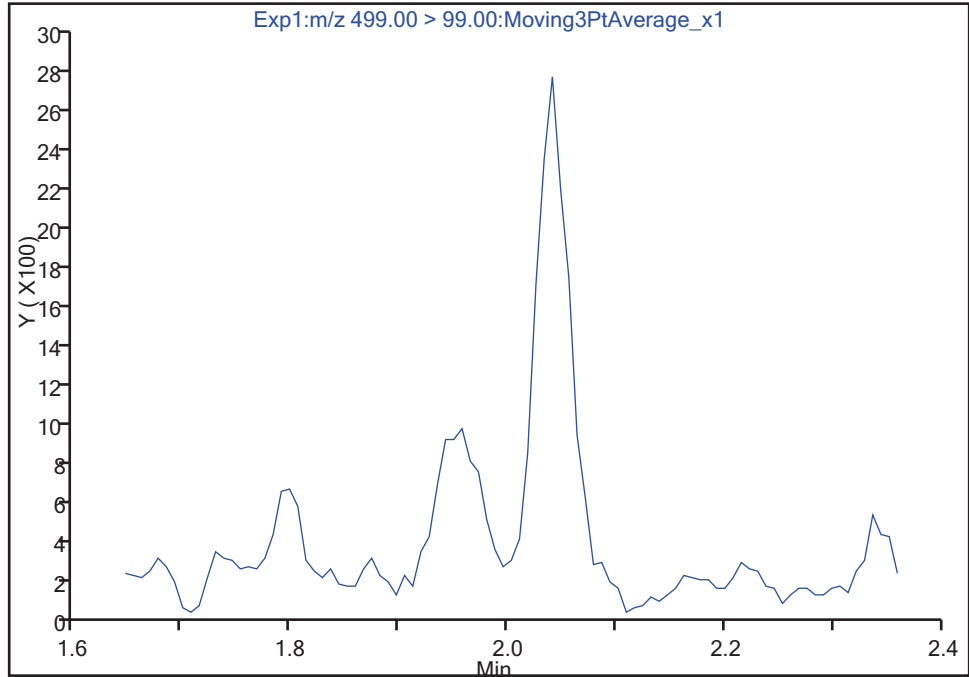
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_020.d
Injection Date: 15-Mar-2018 22:43:26 Instrument ID: A8_N
Lims ID: 320-36794-A-1-A Lab Sample ID: 320-36794-1
Client ID: NAWC-030518-RW-055
Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: 16
Injection Vol: 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

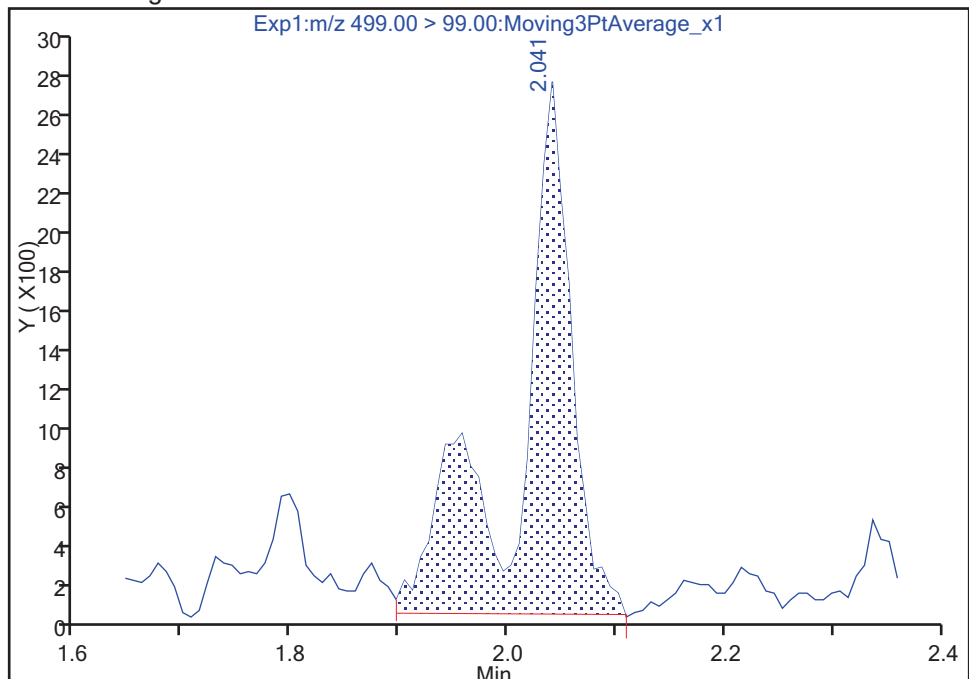
Signal: 2

Not Detected
Expected RT: 2.03

Processing Integration Results



Manual Integration Results



RT: 2.04
Area: 9536
Amount: 0.594840
Amount Units: ng/ml

Reviewer: barnettj, 16-Mar-2018 10:17:41

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

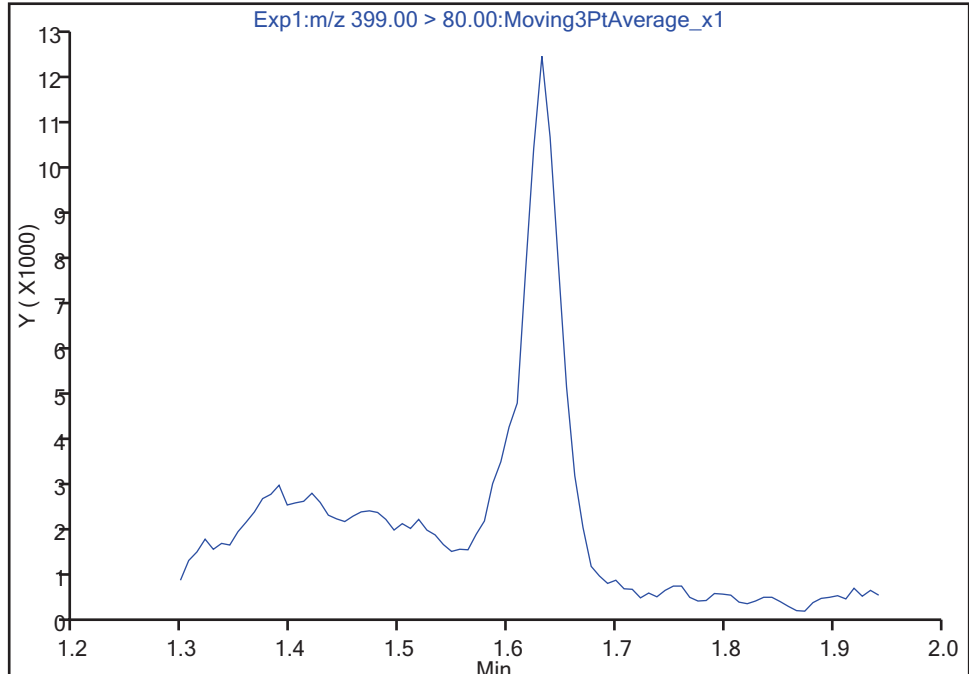
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_020.d
Injection Date: 15-Mar-2018 22:43:26 Instrument ID: A8_N
Lims ID: 320-36794-A-1-A Lab Sample ID: 320-36794-1
Client ID: NAWC-030518-RW-055
Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: 16
Injection Vol: 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

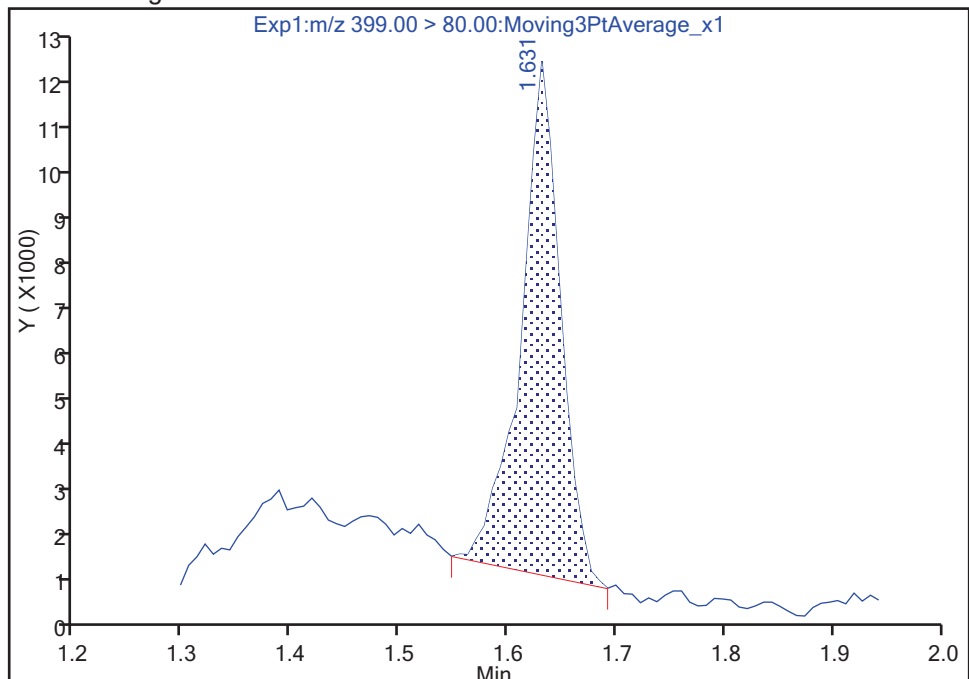
Signal: 1

Not Detected
Expected RT: 1.62

Processing Integration Results



Manual Integration Results



RT: 1.63
Area: 27286
Amount: 0.189117
Amount Units: ng/ml

Reviewer: barnettj, 16-Mar-2018 10:17:22

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

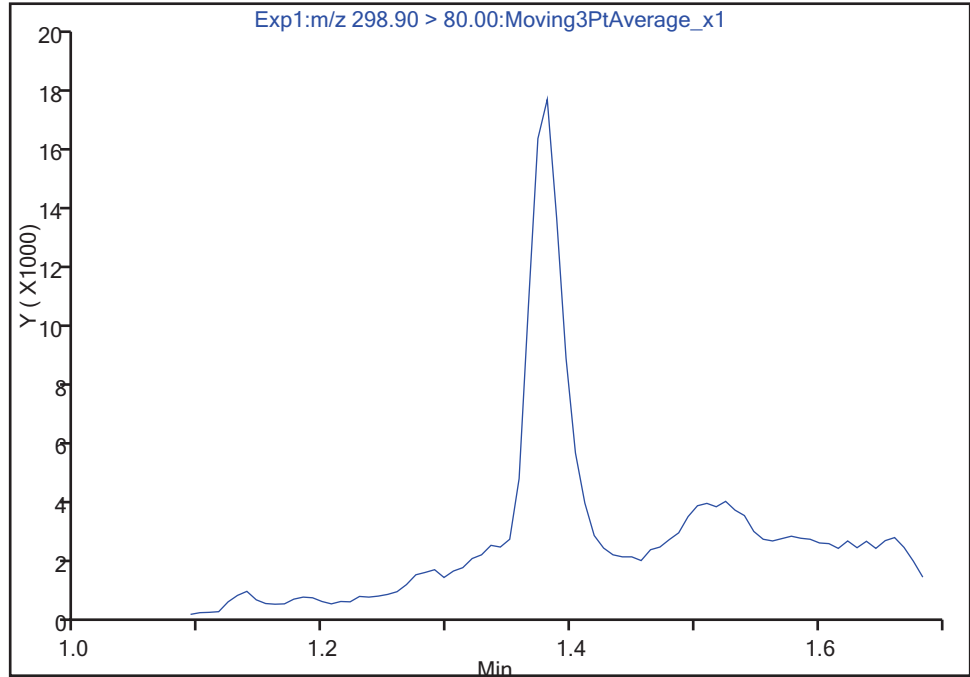
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Injection Date: 15-Mar-2018 22:43:26 Instrument ID: A8_N
Lims ID: 320-36794-A-1-A Lab Sample ID: 320-36794-1
Client ID: NAWC-030518-RW-055
Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

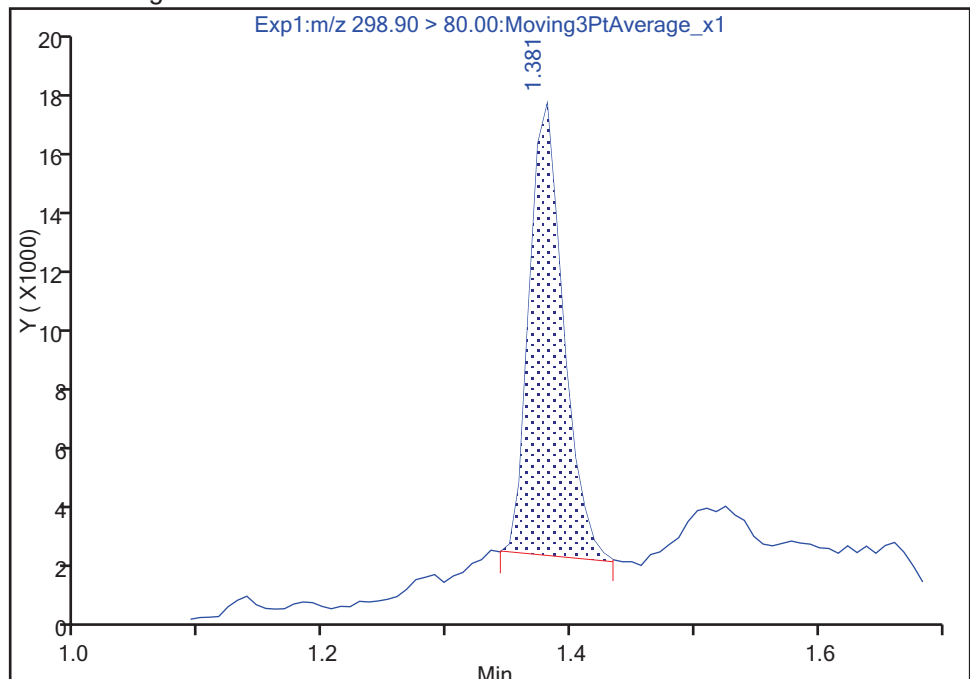
Not Detected
Expected RT: 1.37

Processing Integration Results



RT: 1.38
Area: 28255
Amount: 0.277687
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 16-Mar-2018 10:17:05
Audit Action: Manually Integrated

Audit Reason: Missed Peak
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TestAmerica Sacramento

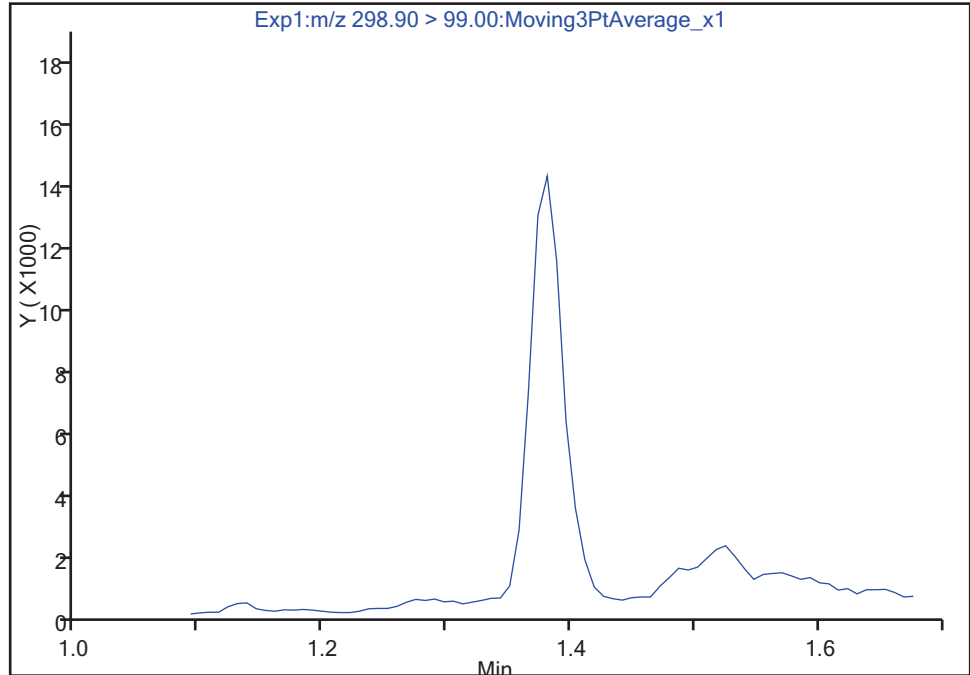
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Injection Date: 15-Mar-2018 22:43:26 Instrument ID: A8_N
Lims ID: 320-36794-A-1-A Lab Sample ID: 320-36794-1
Client ID: NAWC-030518-RW-055
Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

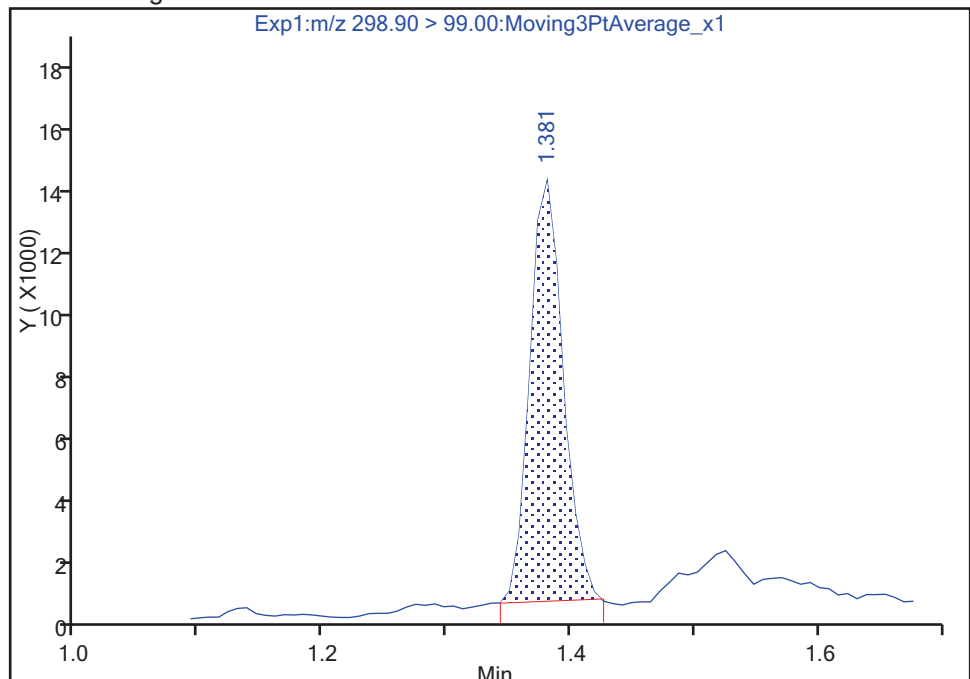
Not Detected
Expected RT: 1.37

Processing Integration Results



Manual Integration Results

RT: 1.38
Area: 25218
Amount: 0.277687
Amount Units: ng/ml



Reviewer: barnettj, 16-Mar-2018 10:17:09

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-FRB-055</u>	Lab Sample ID: <u>320-36794-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_021.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 10:05</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>261.3 (mL)</u>	Date Analyzed: <u>03/15/2018 22:48</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213297</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	29	11	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	86	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	101		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_021.d
 Lims ID: 320-36794-A-2-A
 Client ID: NAWC-030518-FRB-055
 Sample Type: Client
 Inject. Date: 15-Mar-2018 22:48:07 ALS Bottle#: 13 Worklist Smp#: 17
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-36794-a-2-a
 Misc. Info.: Plate: 1 Rack: 6
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_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	1.517	1.495	0.022	1.000	998123	9.35		12446	
* 6 13C2-PFOA									
415.00 > 370.00	1.821	1.798	0.023		978146	10.0		8541	
* 7 13C4 PFOS									
503.00 > 80.00	1.995	2.026	-0.031		2735043	28.7		8159	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.155	2.231	-0.076	1.000	617742	10.1		2164	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_021.d

Injection Date: 15-Mar-2018 22:48:07

Instrument ID: A8_N

Lims ID: 320-36794-A-2-A

Lab Sample ID: 320-36794-2

Client ID: NAWC-030518-FRB-055

Operator ID: SACINSTLCMS01

ALS Bottle#: 13

Worklist Smp#: 17

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

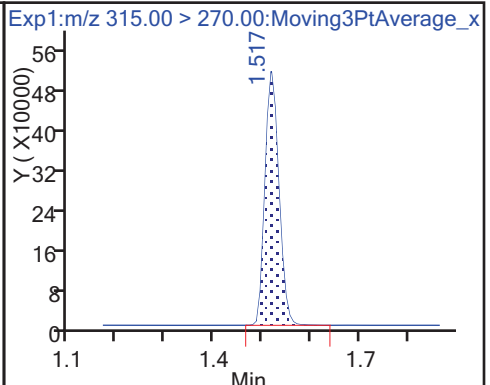
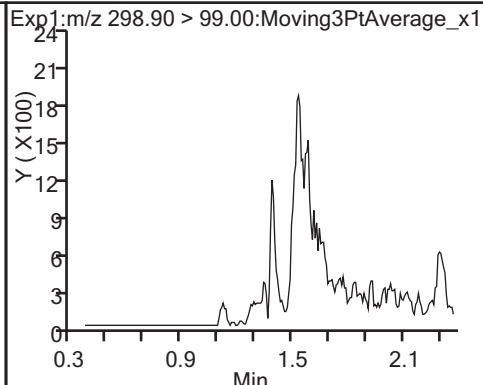
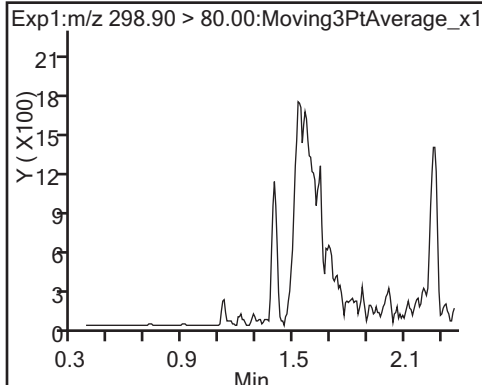
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

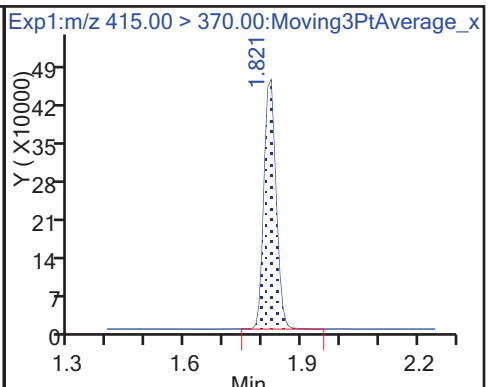
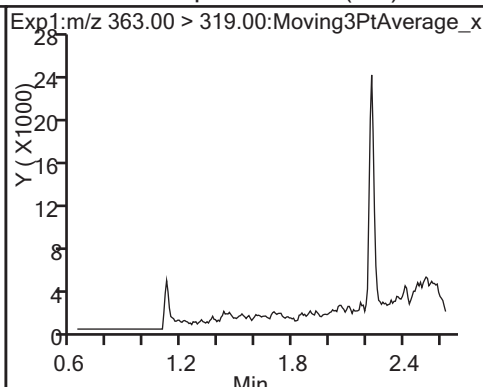
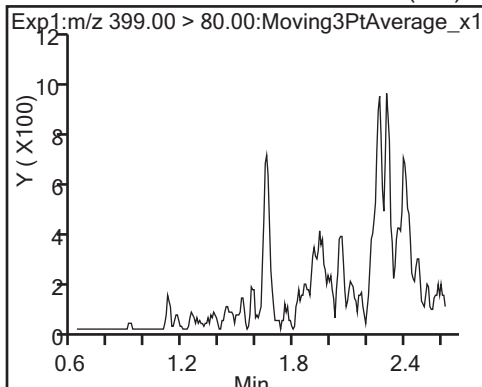
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

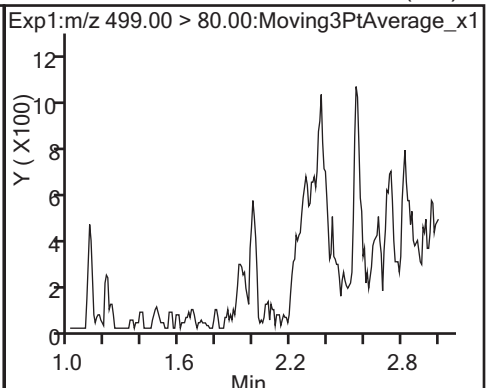
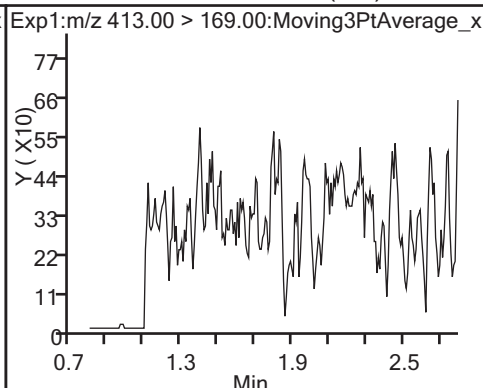
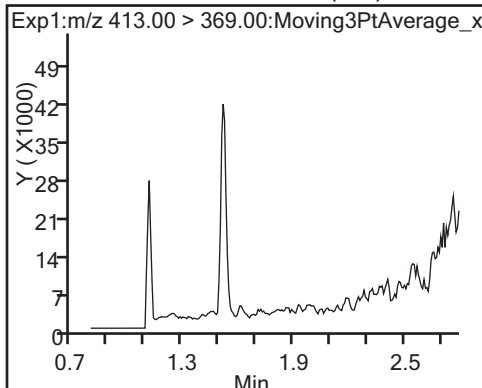
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

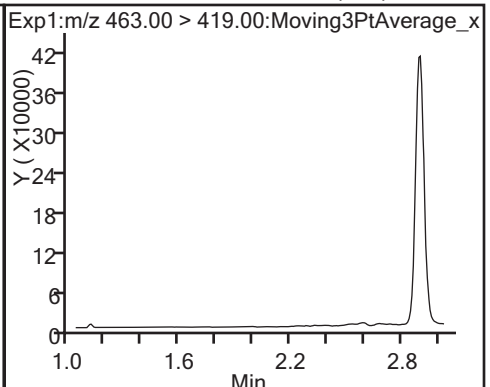
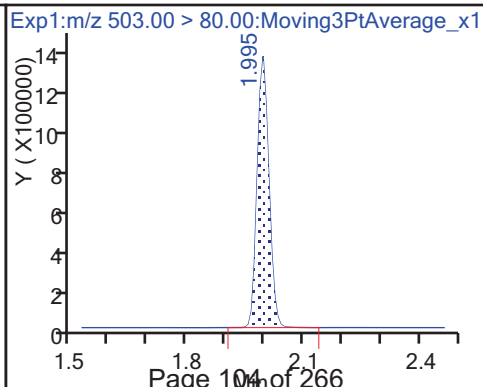
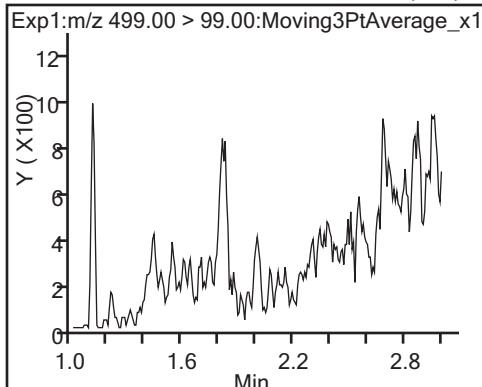
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

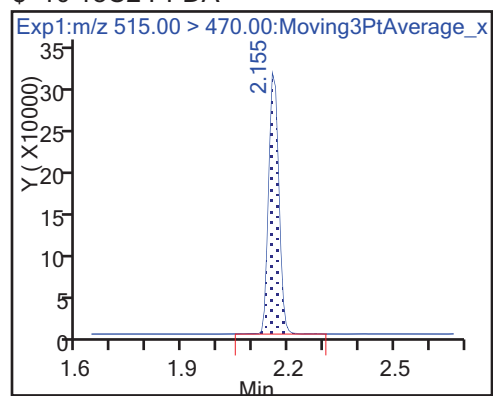


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_021.d
Lims ID: 320-36794-A-2-A
Client ID: NAWC-030518-FRB-055
Sample Type: Client
Inject. Date: 15-Mar-2018 22:48:07 ALS Bottle#: 13 Worklist Smp#: 17
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-36794-a-2-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK015

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.35	93.46
\$ 10 13C2 PFDA	10.0	10.1	100.74

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-RW-124</u>	Lab Sample ID: <u>320-36794-3</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_022.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 10:40</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>247.4 (mL)</u>	Date Analyzed: <u>03/15/2018 22:52</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213297</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	34	J M	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	30		20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	17	J	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.0	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	94		70-130
STL00996	13C2 PFDA	110		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_022.d
 Lims ID: 320-36794-A-3-A
 Client ID: NAWC-030518-RW-124
 Sample Type: Client
 Inject. Date: 15-Mar-2018 22:52:48 ALS Bottle#: 14 Worklist Smp#: 18
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-36794-a-3-a
 Misc. Info.: Plate: 1 Rack: 6
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK015

First Level Reviewer: barnettj

Date: 16-Mar-2018 10:18:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.373	0.0	1.000	194891	1.93		11.8	
298.90 > 99.00	1.373	1.373	0.0	1.000	146794		1.33(0.00-0.00)	266	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.487	1.495	-0.008	1.000	954469	9.35		11356	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.624	0.0	1.000	597714	4.16		333	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.631	-0.007	1.000	140432	1.49		18.7	
* 6 13C2-PFOA									
415.00 > 370.00	1.798	1.798	0.0		934535	10.0		6637	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.798	1.798	0.0	1.000	651203	7.41		19.2	
413.00 > 169.00	1.798	1.798	0.0	1.000	380892		1.71(0.00-0.00)	411	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.033	2.026	0.007	1.000	713388	8.32		204	a
499.00 > 99.00	2.033	2.026	0.007	1.000	133767		5.33(0.00-0.00)	82.5	a
* 7 13C4 PFOS									
503.00 > 80.00	2.033	2.026	0.007		2597022	28.7		1599	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.231	2.231	0.0	1.000	645572	11.0		2990	

QC Flag Legend

Review Flags

a - User Assigned ID

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_022.d

Injection Date: 15-Mar-2018 22:52:48

Instrument ID: A8_N

Lims ID: 320-36794-A-3-A

Lab Sample ID: 320-36794-3

Client ID: NAWC-030518-RW-124

Operator ID: SACINSTLCMS01

ALS Bottle#: 14

Worklist Smp#: 18

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

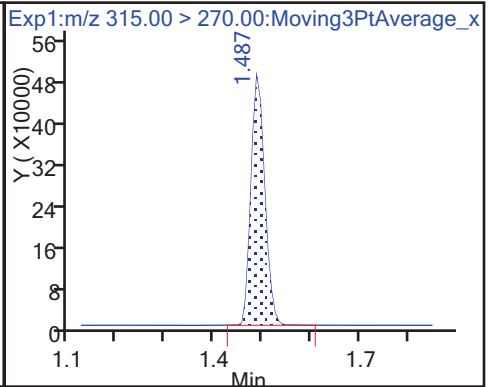
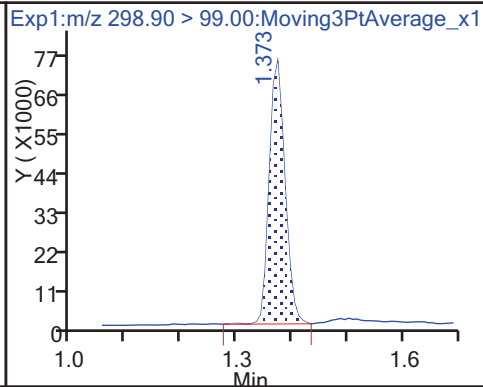
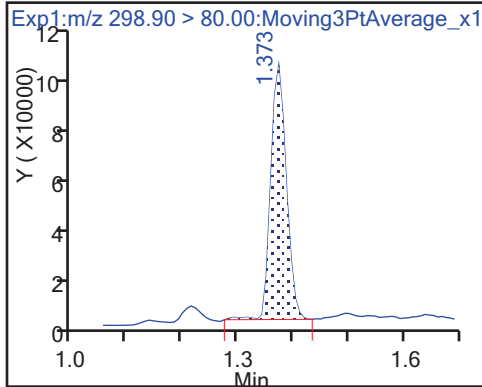
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

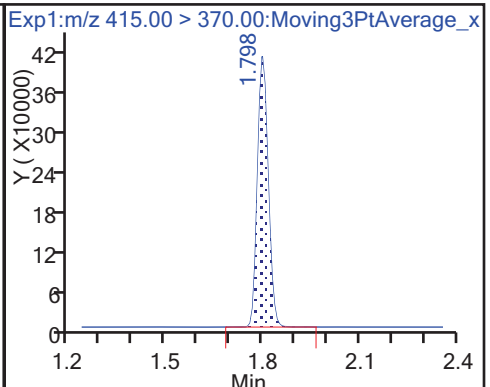
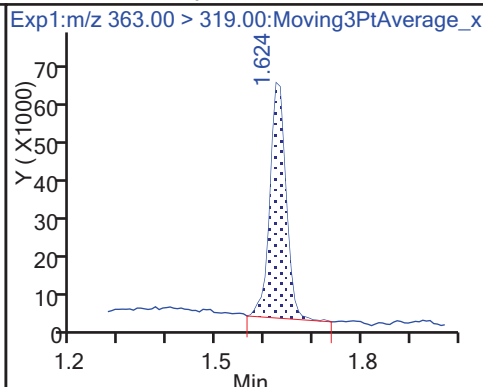
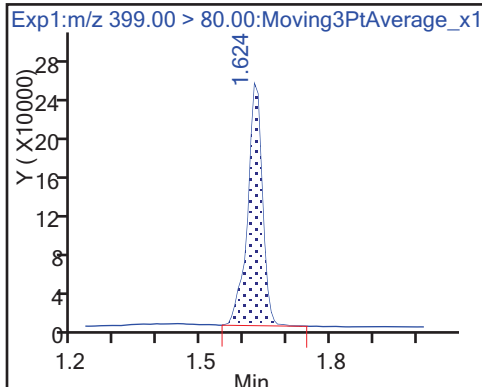
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

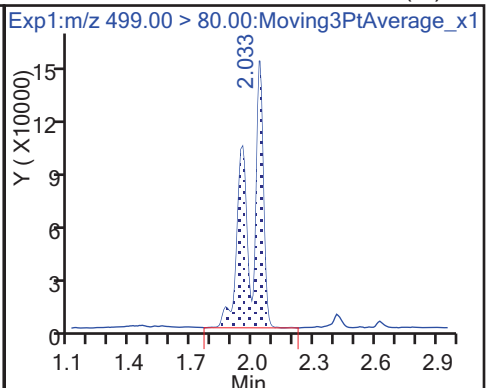
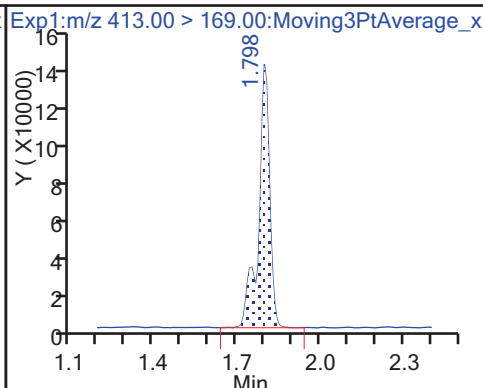
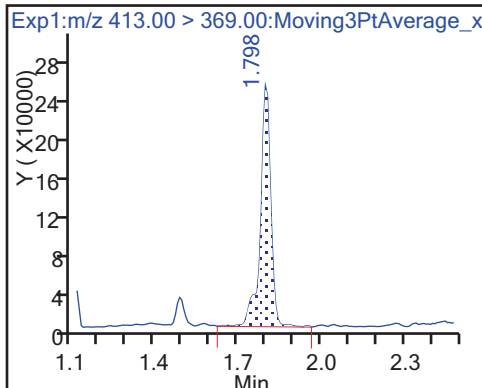
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

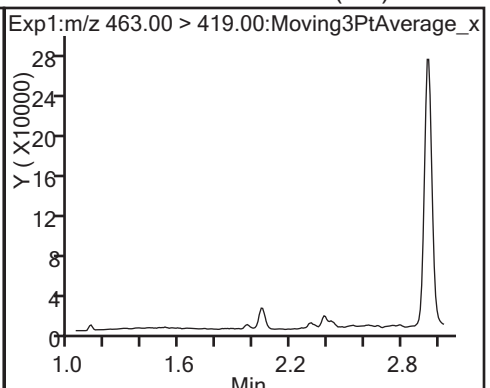
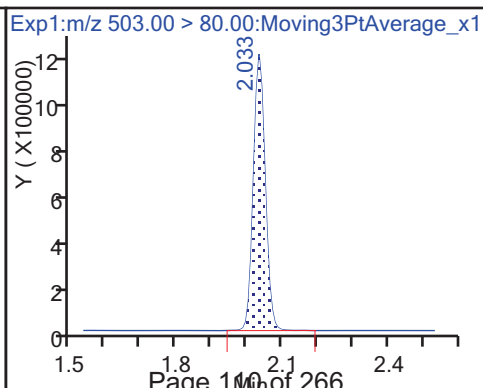
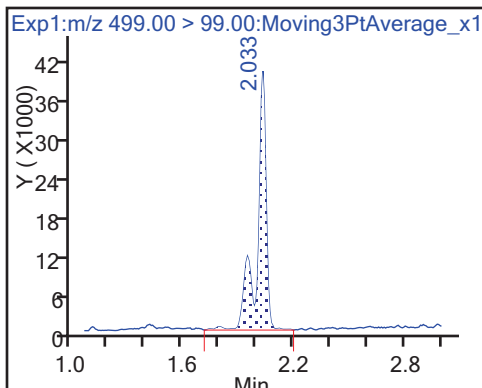
8 Perfluorooctane sulfonic acid (M)



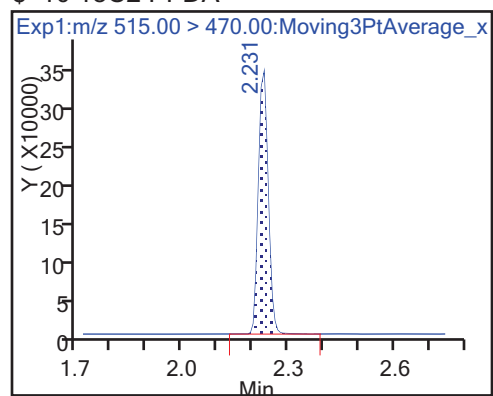
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_022.d
Lims ID: 320-36794-A-3-A
Client ID: NAWC-030518-RW-124
Sample Type: Client
Inject. Date: 15-Mar-2018 22:52:48 ALS Bottle#: 14 Worklist Smp#: 18
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-36794-a-3-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d
Column 1 : Det: EXP1
Process Host: XAWRK015

First Level Reviewer: barnettj

Date: 16-Mar-2018 10:18:24

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.35	93.54
\$ 10 13C2 PFDA	10.0	11.0	110.19

TestAmerica Sacramento

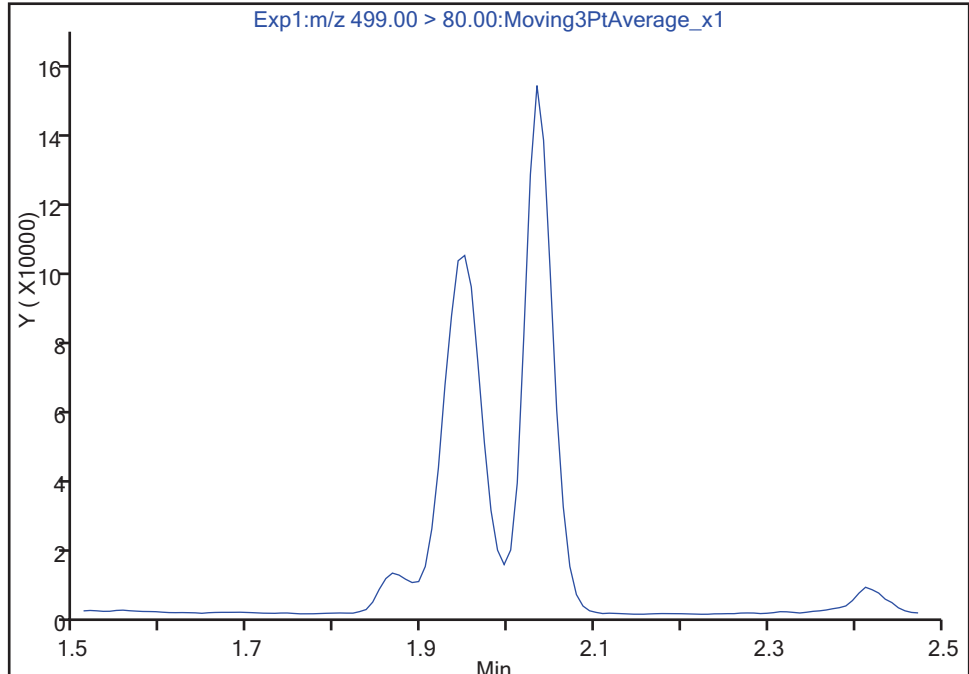
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_022.d				
Injection Date:	15-Mar-2018 22:52:48	Instrument ID:	A8_N		
Lims ID:	320-36794-A-3-A	Lab Sample ID:	320-36794-3		
Client ID:	NAWC-030518-RW-124				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	14	Worklist Smp#:	18
Injection 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

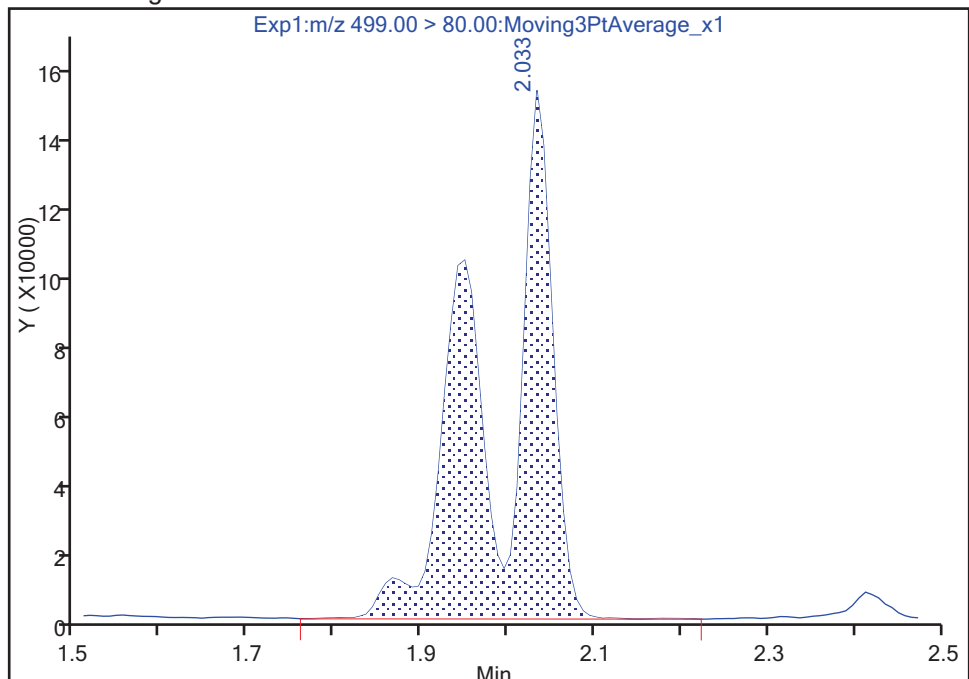
Signal: 1

Not Detected
Expected RT: 2.03

Processing Integration Results



Manual Integration Results

RT: 2.03
Area: 713388
Amount: 8.315698
Amount Units: ng/ml

Reviewer: barnettj, 16-Mar-2018 10:18:15

Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-FRB-124</u>	Lab Sample ID: <u>320-36794-4</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_023.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 10:35</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>253.1 (mL)</u>	Date Analyzed: <u>03/15/2018 22:57</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213297</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	104		70-130
STL00996	13C2 PFDA	111		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_023.d
 Lims ID: 320-36794-A-4-A
 Client ID: NAWC-030518-FRB-124
 Sample Type: Client
 Inject. Date: 15-Mar-2018 22:57:30 ALS Bottle#: 15 Worklist Smp#: 19
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-36794-a-4
 Misc. Info.: Plate: 1 Rack: 6
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_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	1.495	-0.008	1.000	1072216	10.4		14101	
* 6 13C2-PFOA									
415.00 > 370.00	1.783	1.798	-0.015		942072	10.0		8662	
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.026	-0.023		2599292	28.7		6215	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.231	-0.016	1.000	656460	11.1		2908	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_023.d

Injection Date: 15-Mar-2018 22:57:30

Instrument ID: A8_N

Lims ID: 320-36794-A-4-A

Lab Sample ID: 320-36794-4

Client ID: NAWC-030518-FRB-124

Operator ID: SACINSTLCMS01

ALS Bottle#: 15

Worklist Smp#: 19

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

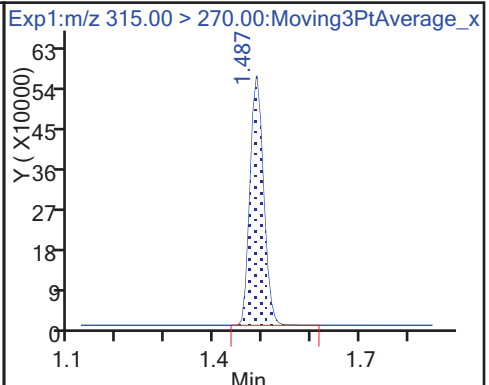
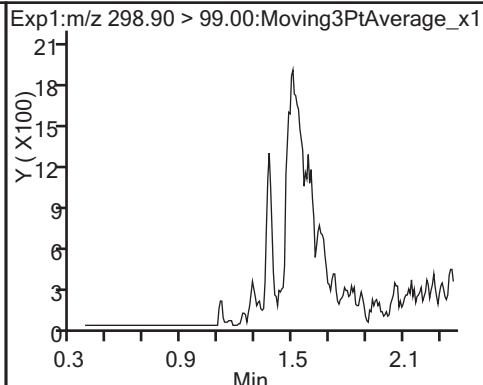
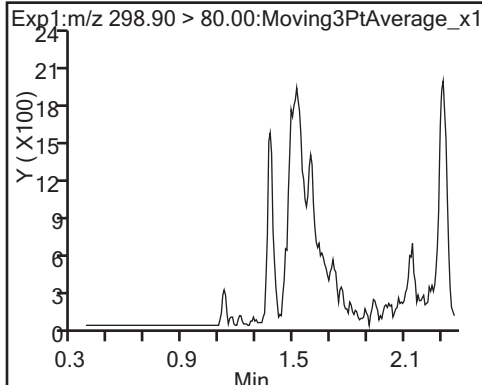
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

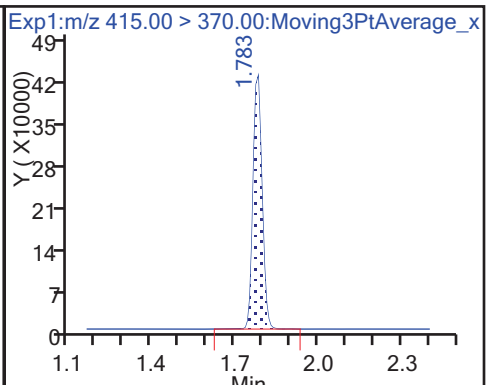
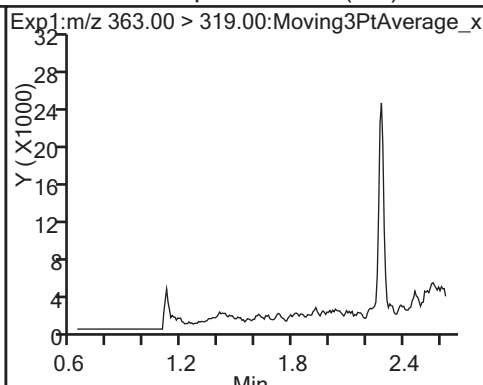
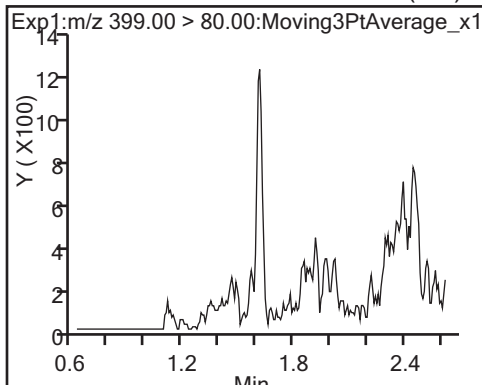
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

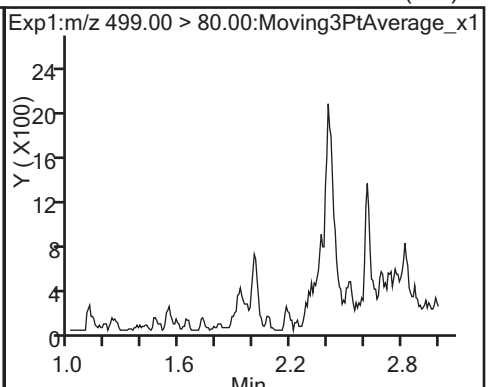
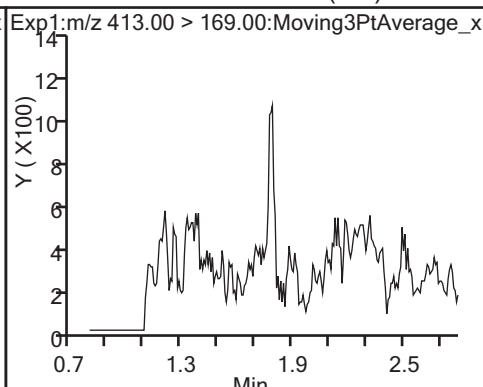
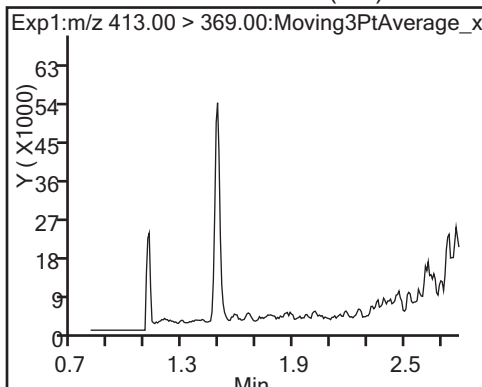
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

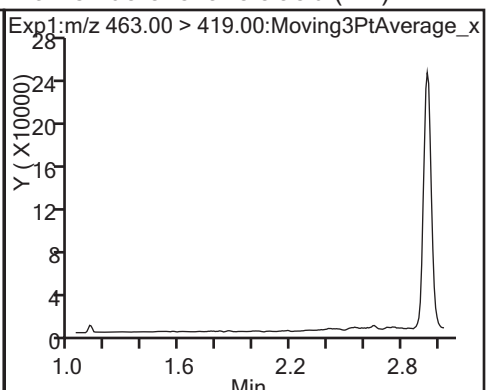
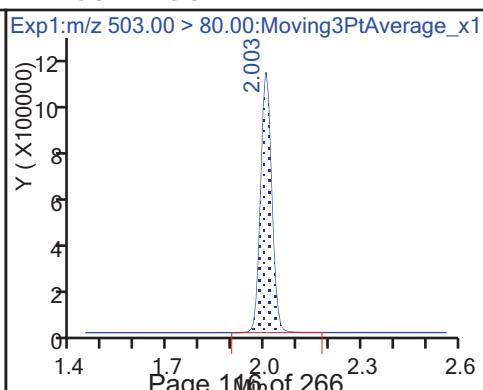
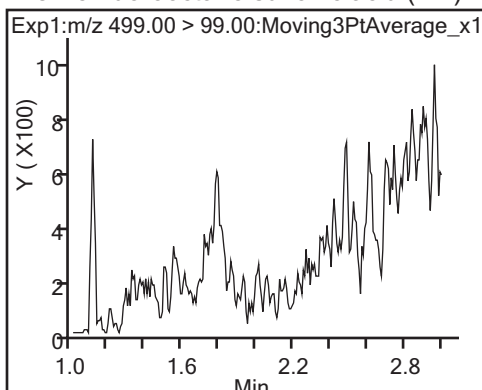
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

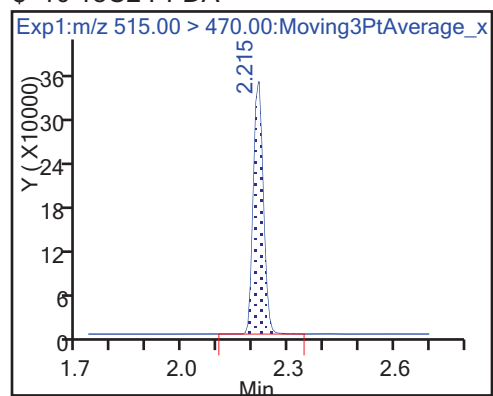


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_023.d
Lims ID: 320-36794-A-4-A
Client ID: NAWC-030518-FRB-124
Sample Type: Client
Inject. Date: 15-Mar-2018 22:57:30 ALS Bottle#: 15 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-36794-a-4
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK015

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.4	104.24
\$ 10 13C2 PFDA	10.0	11.1	111.15

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-RW-201</u>	Lab Sample ID: <u>320-36794-5</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_024.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 11:10</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>260.2 (mL)</u>	Date Analyzed: <u>03/15/2018 23:02</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213297</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.8	J M	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	14	J	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U M	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.3	J	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U M	86	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	112		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_024.d
 Lims ID: 320-36794-A-5-A
 Client ID: NAWC-030518-RW-201
 Sample Type: Client
 Inject. Date: 15-Mar-2018 23:02:11 ALS Bottle#: 16 Worklist Smp#: 20
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-36794-a-5-a
 Misc. Info.: Plate: 1 Rack: 6
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK015

First Level Reviewer: barnettj

Date: 16-Mar-2018 10:19:29

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.373	0.0	1.000	52819	0.4993		64.5	M
298.90 > 99.00	1.373	1.373	0.0	1.000	38764		1.36(0.00-0.00)	85.9	M
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.487	1.495	-0.008	1.000	937323	9.02		12921	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.616	1.624	-0.008	1.000	81374	0.5423		63.8	M
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.616	1.631	-0.015	1.000	107349	1.12		19.7	
* 6 13C2-PFOA									
415.00 > 370.00	1.775	1.798	-0.023		951290	10.0		9163	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.783	1.798	-0.015	1.000	331910	3.71		10.6	
413.00 > 169.00	1.783	1.798	-0.015	1.000	189492		1.75(0.00-0.00)	225	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.003	2.026	-0.023	1.000	229039	2.56		125	a
499.00 > 99.00	2.003	2.026	-0.023	1.000	40806		5.61(0.00-0.00)	24.2	a
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.026	-0.023		2713732	28.7		4336	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.231	-0.016	1.000	669990	11.2		2766	

QC Flag Legend

Review Flags

M - Manually Integrated

a - User Assigned ID

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_024.d

Injection Date: 15-Mar-2018 23:02:11

Instrument ID: A8_N

Lims ID: 320-36794-A-5-A

Lab Sample ID: 320-36794-5

Client ID: NAWC-030518-RW-201

Operator ID: SACINSTLCMS01

ALS Bottle#: 16

Worklist Smp#: 20

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

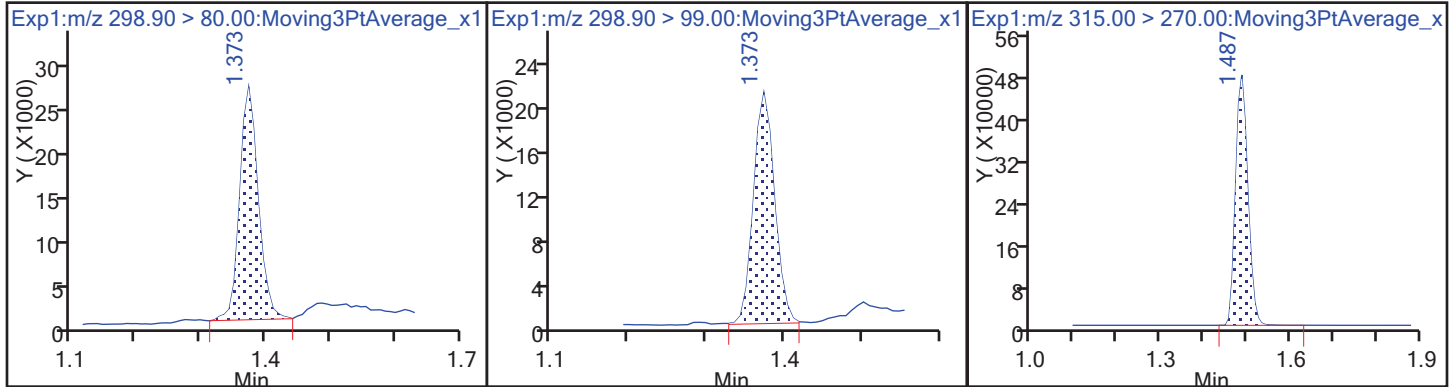
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (M)

1 Perfluorobutanesulfonic acid (M)

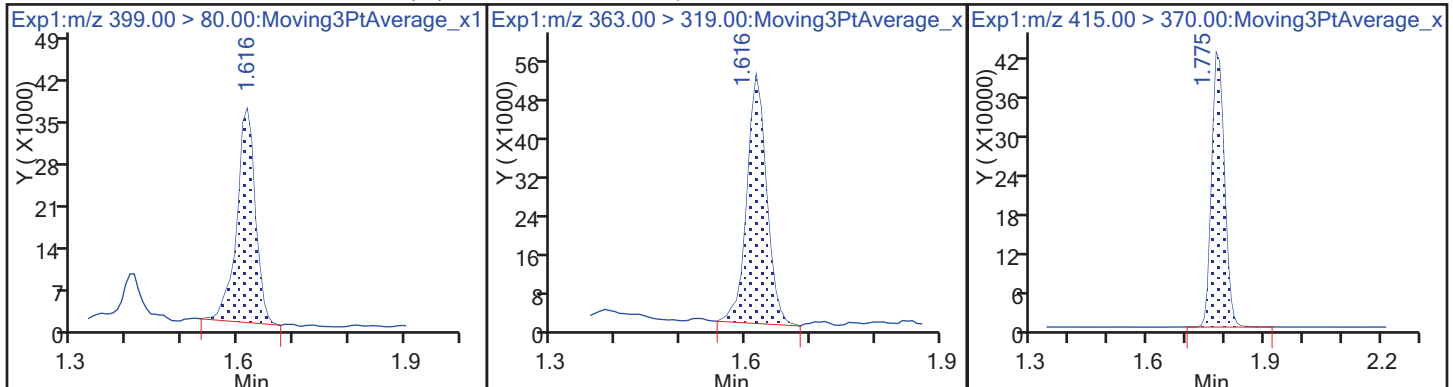
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (M)

4 Perfluoroheptanoic acid

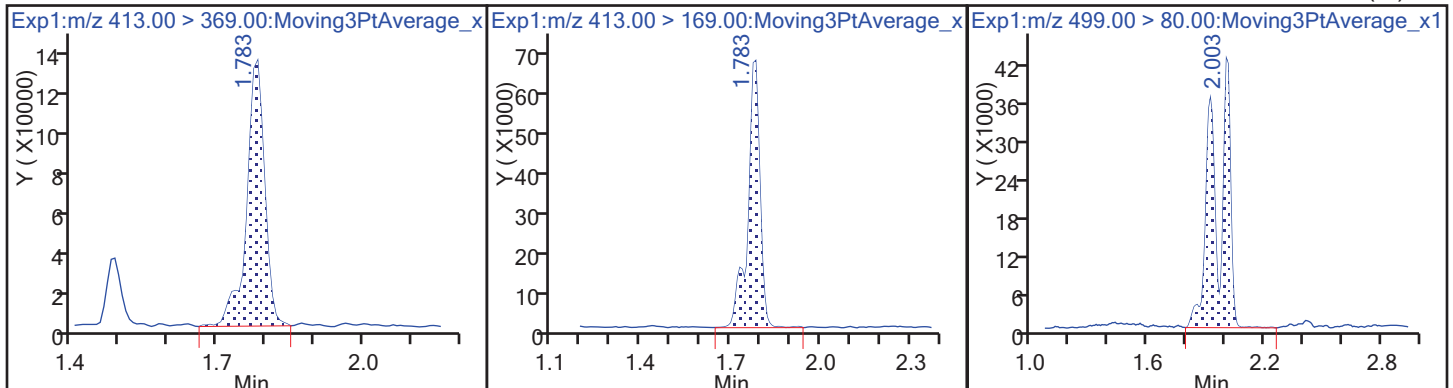
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

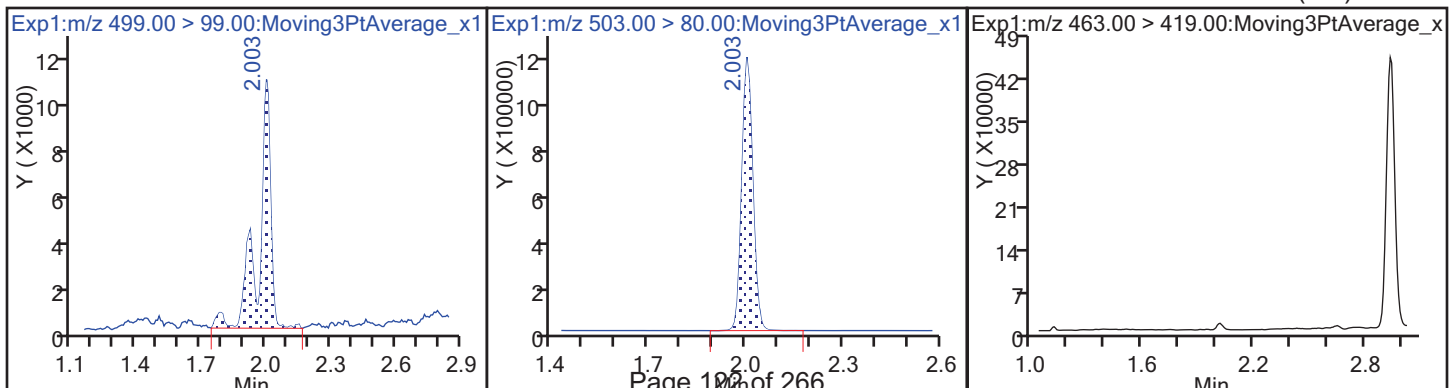
8 Perfluorooctane sulfonic acid (M)



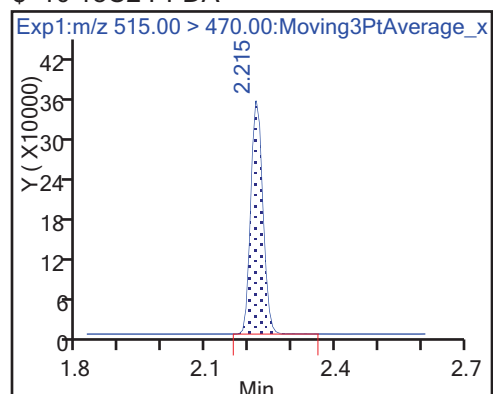
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_024.d
Lims ID: 320-36794-A-5-A
Client ID: NAWC-030518-RW-201
Sample Type: Client
Inject. Date: 15-Mar-2018 23:02:11 ALS Bottle#: 16 Worklist Smp#: 20
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-36794-a-5-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d
Column 1 : Det: EXP1
Process Host: XAWRK015

First Level Reviewer: barnettj

Date: 16-Mar-2018 10:19:29

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.02	90.24
\$ 10 13C2 PFDA	10.0	11.2	112.34

TestAmerica Sacramento

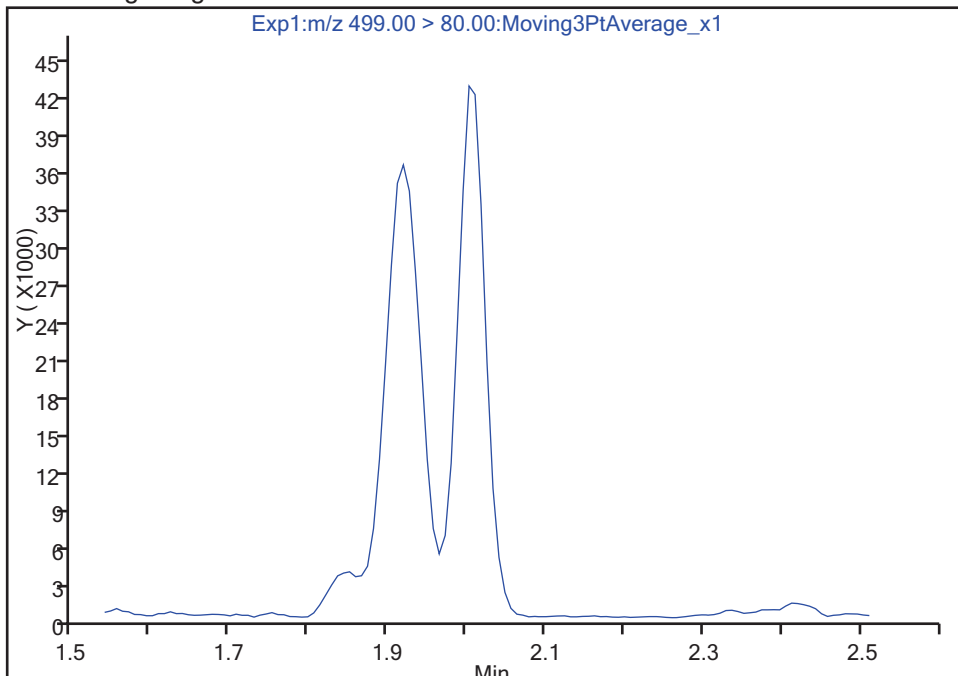
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_024.d
Injection Date: 15-Mar-2018 23:02:11 Instrument ID: A8_N
Lims ID: 320-36794-A-5-A Lab Sample ID: 320-36794-5
Client ID: NAWC-030518-RW-201
Operator ID: SACINSTLCMS01 ALS Bottle#: 16 Worklist Smp#: 20
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

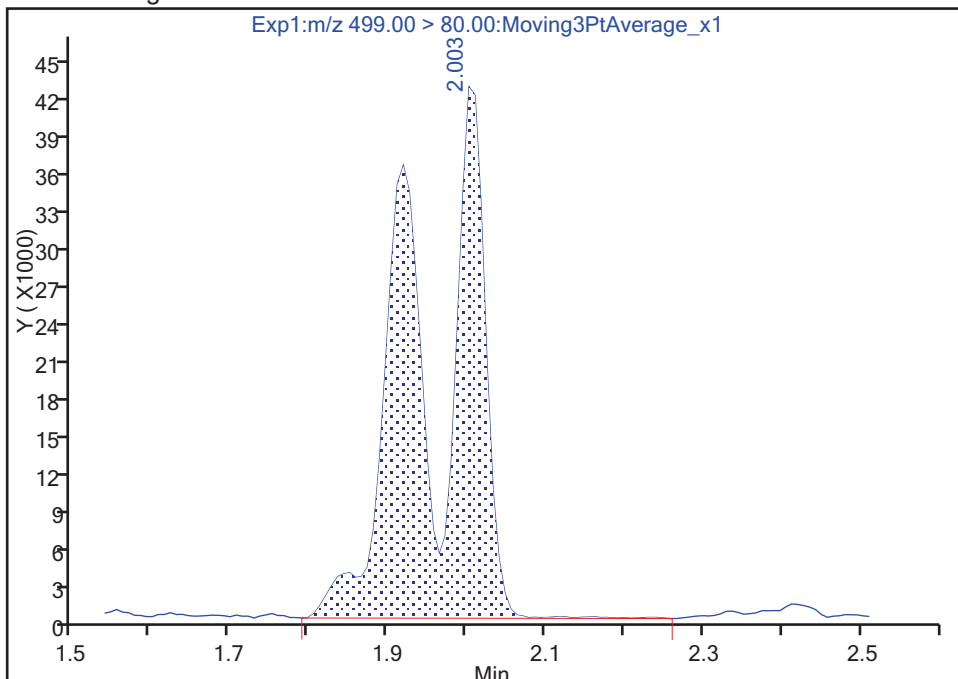
Signal: 1

Not Detected
Expected RT: 2.03

Processing Integration Results



Manual Integration Results



RT: 2.00
Area: 229039
Amount: 2.555001
Amount Units: ng/ml

Reviewer: barnettj, 16-Mar-2018 10:19:22

Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

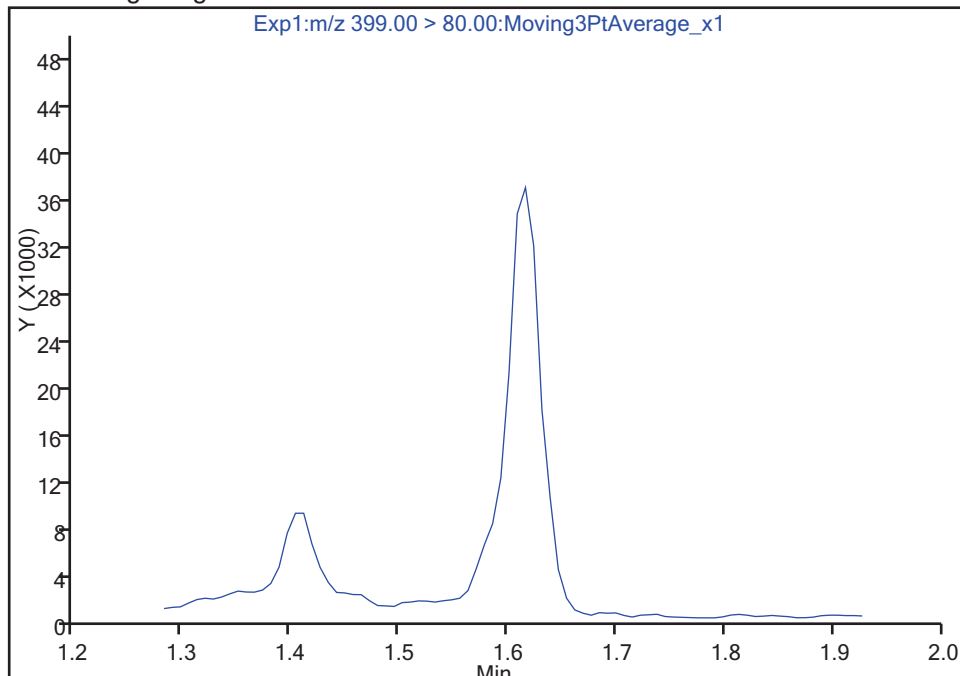
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_024.d
Injection Date: 15-Mar-2018 23:02:11 Instrument ID: A8_N
Lims ID: 320-36794-A-5-A Lab Sample ID: 320-36794-5
Client ID: NAWC-030518-RW-201
Operator ID: SACINSTLCMS01 ALS Bottle#: 16 Worklist Smp#: 20
Injection Vol: 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

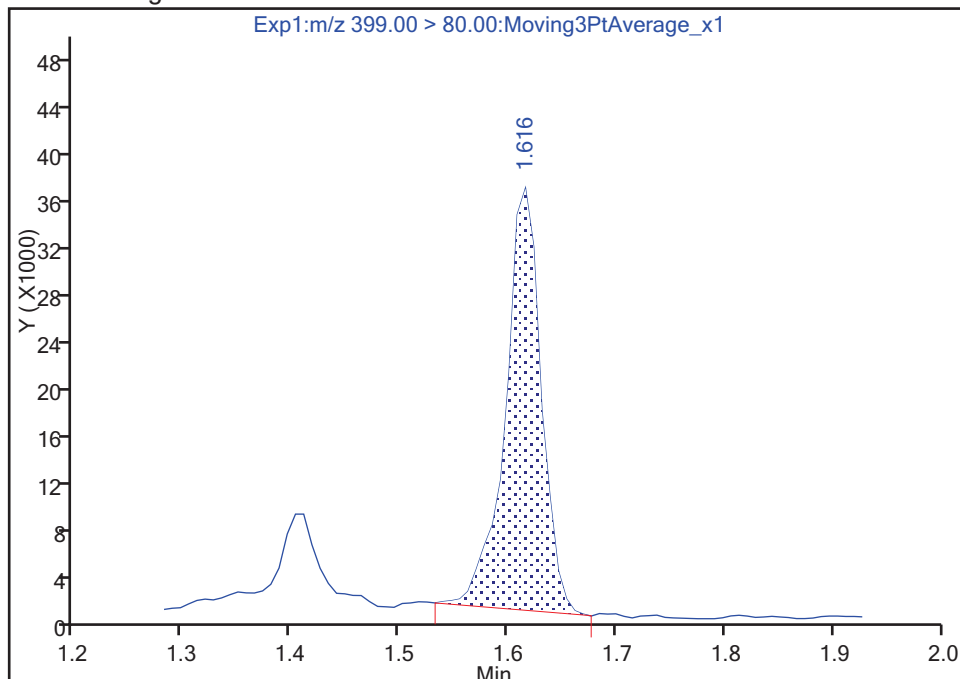
Signal: 1

Not Detected
Expected RT: 1.62

Processing Integration Results



Manual Integration Results



RT: 1.62
Area: 81374
Amount: 0.542310
Amount Units: ng/ml

Reviewer: barnettj, 16-Mar-2018 10:19:10

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

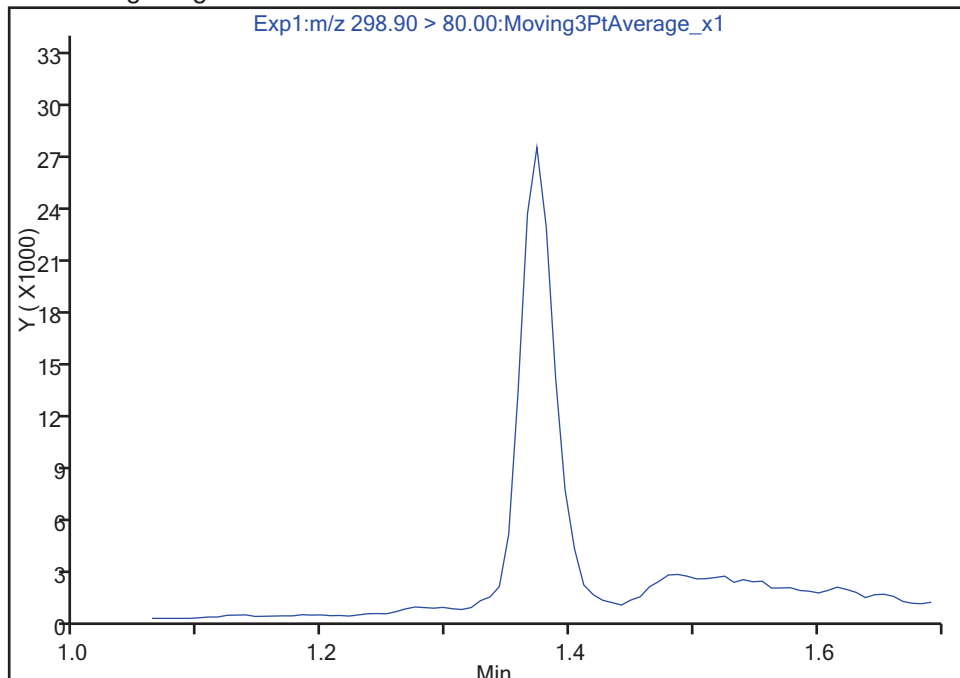
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_024.d
Injection Date: 15-Mar-2018 23:02:11 Instrument ID: A8_N
Lims ID: 320-36794-A-5-A Lab Sample ID: 320-36794-5
Client ID: NAWC-030518-RW-201
Operator ID: SACINSTLCMS01 ALS Bottle#: 16 Worklist Smp#: 20
Injection Vol: 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

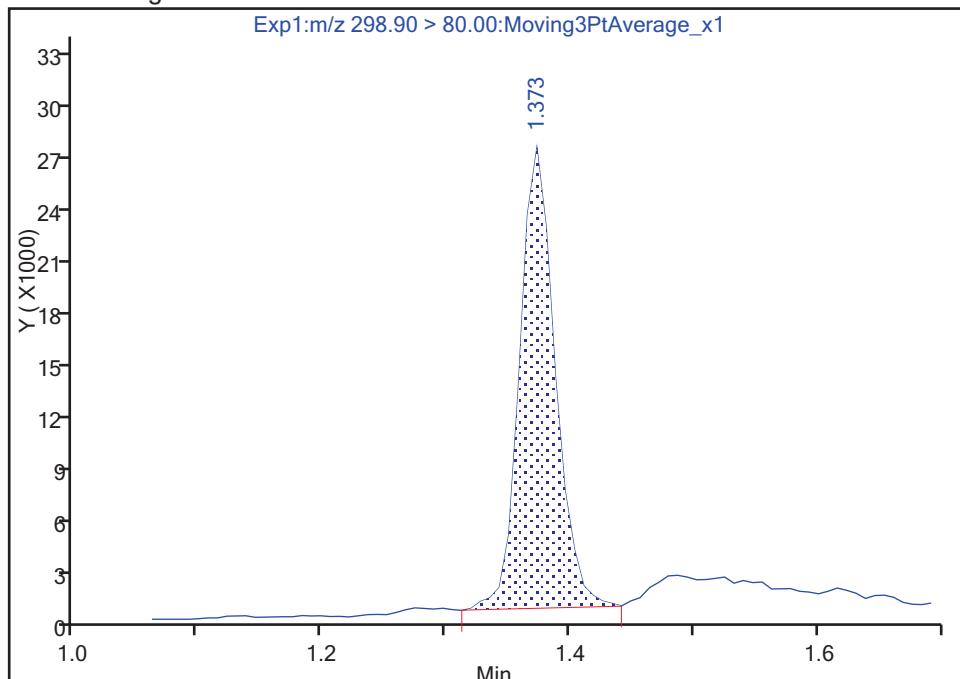
Not Detected
Expected RT: 1.37

Processing Integration Results



RT: 1.37
Area: 52819
Amount: 0.499299
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 16-Mar-2018 10:18:55
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

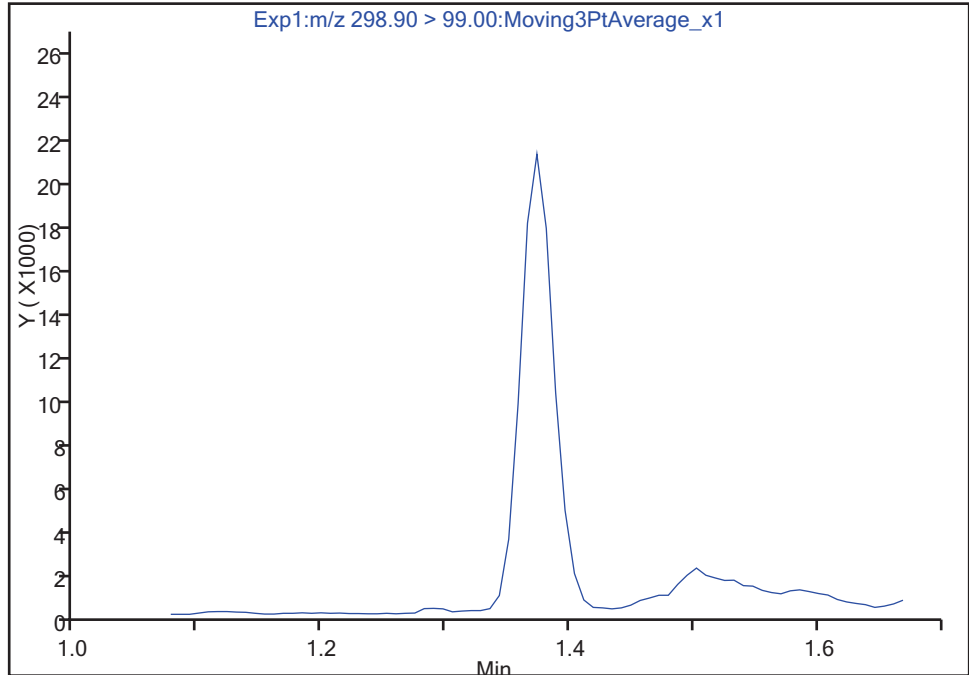
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_024.d
Injection Date: 15-Mar-2018 23:02:11 Instrument ID: A8_N
Lims ID: 320-36794-A-5-A Lab Sample ID: 320-36794-5
Client ID: NAWC-030518-RW-201
Operator ID: SACINSTLCMS01 ALS Bottle#: 16 Worklist Smp#: 20
Injection Vol: 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

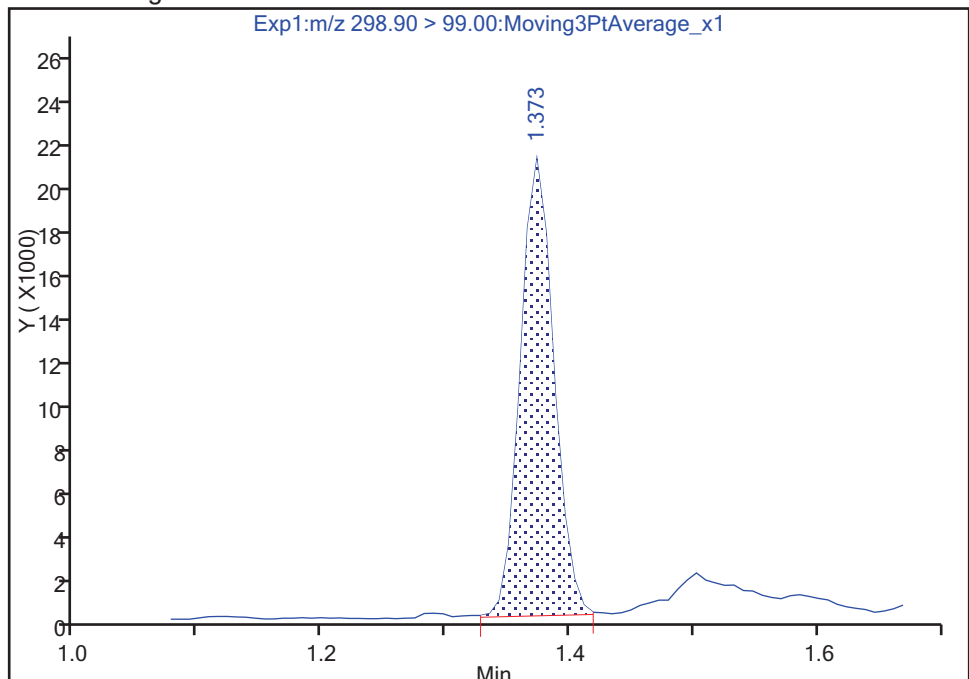
Not Detected
Expected RT: 1.37

Processing Integration Results



Manual Integration Results

RT: 1.37
Area: 38764
Amount: 0.499299
Amount Units: ng/ml



Reviewer: barnettj, 16-Mar-2018 10:19:02

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-FRB-201</u>	Lab Sample ID: <u>320-36794-6</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_025.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 11:05</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>257.2 (mL)</u>	Date Analyzed: <u>03/15/2018 23:06</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213297</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.8	U	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		70-130
STL00996	13C2 PFDA	112		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_025.d
 Lims ID: 320-36794-A-6-A
 Client ID: NAWC-030518-FRB-201
 Sample Type: Client
 Inject. Date: 15-Mar-2018 23:06:52 ALS Bottle#: 17 Worklist Smp#: 21
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-36794-a-6-a
 Misc. Info.: Plate: 1 Rack: 6
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_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	1.495	1.495	0.0	1.000	1046299	10.3		12664	
* 6 13C2-PFOA									
415.00 > 370.00	1.791	1.798	-0.007		928357	10.0		8954	
* 7 13C4 PFOS									
503.00 > 80.00	2.018	2.026	-0.008		2523021	28.7		3796	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.231	2.231	0.0	1.000	652805	11.2		2496	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_025.d

Injection Date: 15-Mar-2018 23:06:52

Instrument ID: A8_N

Lims ID: 320-36794-A-6-A

Lab Sample ID: 320-36794-6

Client ID: NAWC-030518-FRB-201

Operator ID: SACINSTLCMS01

ALS Bottle#: 17

Worklist Smp#: 21

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

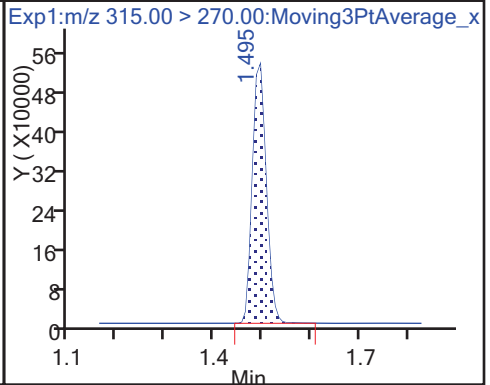
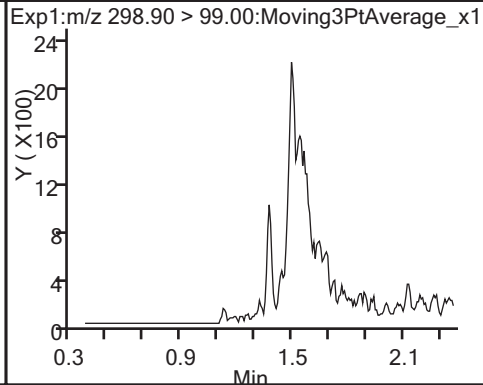
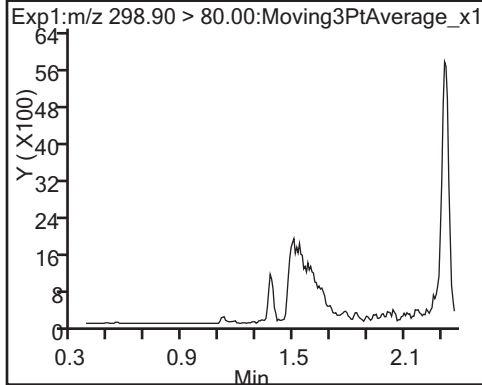
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

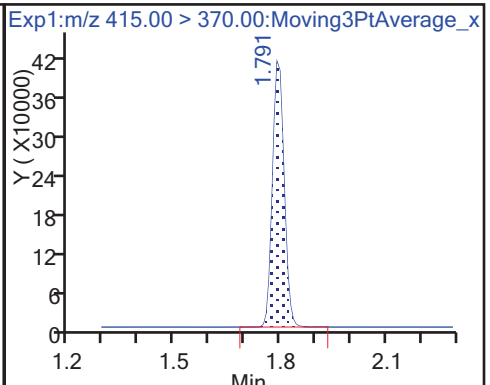
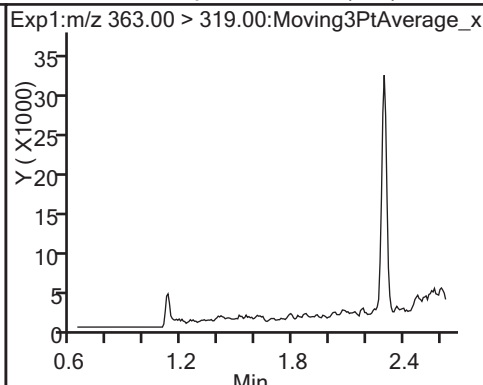
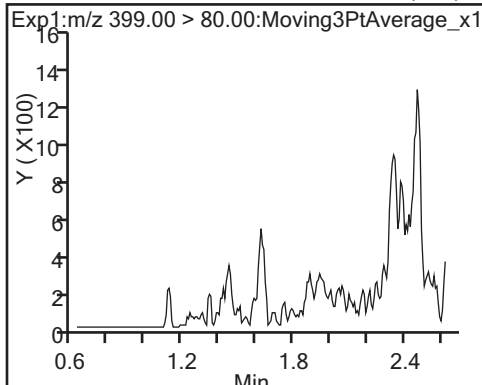
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

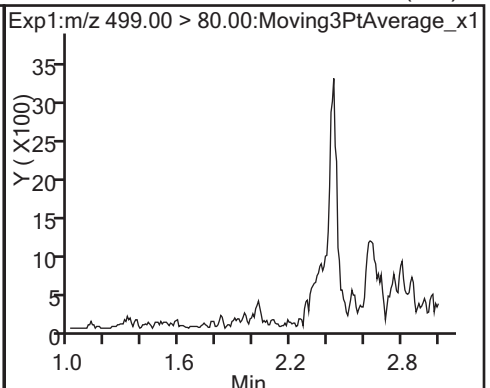
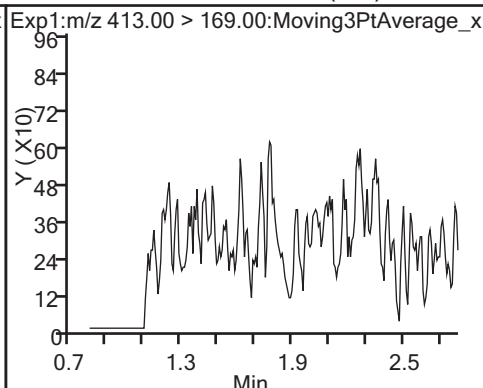
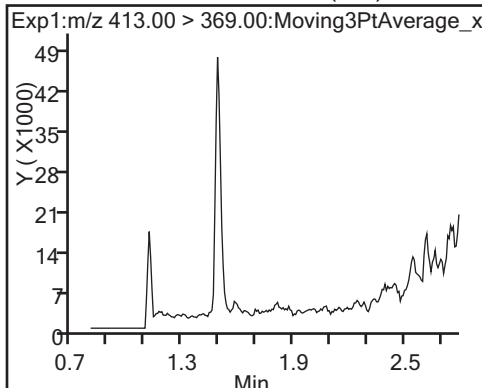
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

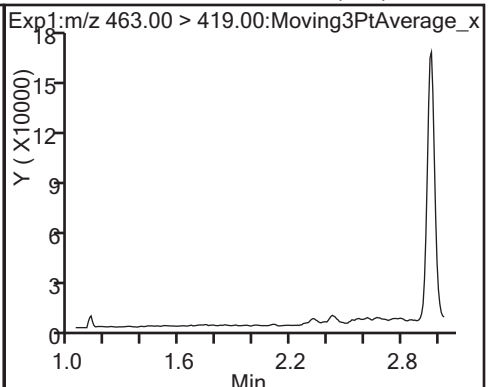
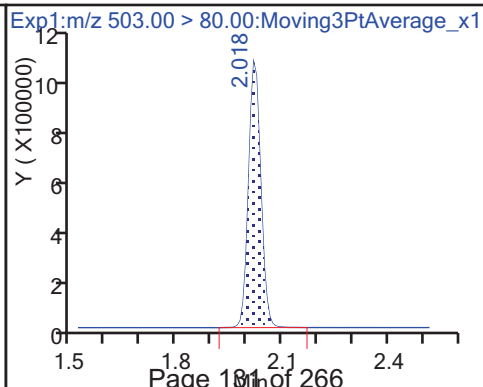
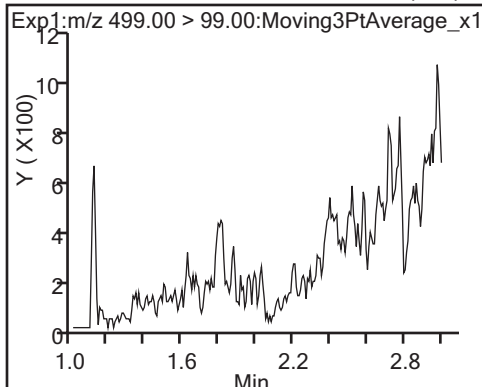
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

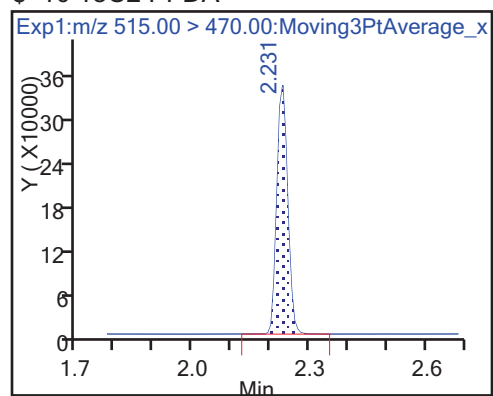


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_025.d
Lims ID: 320-36794-A-6-A
Client ID: NAWC-030518-FRB-201
Sample Type: Client
Inject. Date: 15-Mar-2018 23:06:52 ALS Bottle#: 17 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-36794-a-6-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK015

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.3	103.23
\$ 10 13C2 PFDA	10.0	11.2	112.17

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-RW-190</u>	Lab Sample ID: <u>320-36794-7</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_028.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 11:40</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>260.7(mL)</u>	Date Analyzed: <u>03/15/2018 23:20</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213299</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	11	J M	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	12	J M	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U M	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.5	J	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	86	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	112		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_028.d
 Lims ID: 320-36794-A-7-A
 Client ID: NAWC-030518-RW-190
 Sample Type: Client
 Inject. Date: 15-Mar-2018 23:20:52 ALS Bottle#: 18 Worklist Smp#: 24
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-36794-a-7-a
 Misc. Info.: Plate: 1 Rack: 6
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Mar-2018 10:22:49 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK015

First Level Reviewer: barnettj

Date: 16-Mar-2018 10:20:33

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.373	0.0	1.000	188762	1.53		120	
298.90 > 99.00	1.373	1.373	0.0	1.000	129627		1.46(0.00-0.00)	253	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.487	1.487	0.0	1.000	1164122	9.66		13189	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.616	1.624	-0.008	1.000	100321	0.5719		44.6	M
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.616	1.624	-0.008	1.000	102718	0.9234		13.8	
* 6 13C2-PFOA									
415.00 > 370.00	1.783	1.791	-0.008		1104308	10.0		8487	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.783	1.791	-0.008	1.000	316727	3.05		11.2	M
413.00 > 169.00	1.783	1.791	-0.008	1.000	181150		1.75(0.00-0.00)	221	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.003	2.026	-0.023	1.000	298874	2.85		115	a
499.00 > 99.00	2.003	2.026	-0.023	1.000	53656		5.57(0.00-0.00)	36.7	a
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.026	-0.023		3172593	28.7		2614	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.033	-0.015	1.000	46159	0.5887		1.7	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.231	-0.016	1.000	772425	11.2		3329	

QC Flag Legend

Review Flags

M - Manually Integrated

a - User Assigned ID

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_028.d

Injection Date: 15-Mar-2018 23:20:52

Instrument ID: A8_N

Lims ID: 320-36794-A-7-A

Lab Sample ID: 320-36794-7

Client ID: NAWC-030518-RW-190

Operator ID: SACINSTLCMS01

ALS Bottle#: 18

Worklist Smp#: 24

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

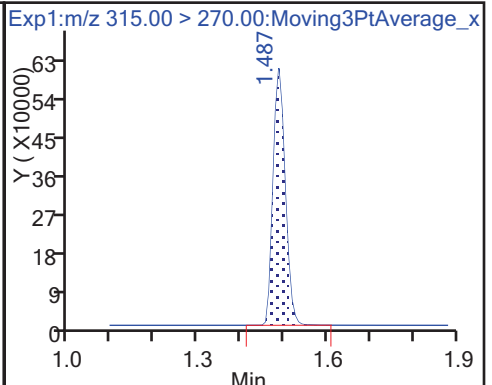
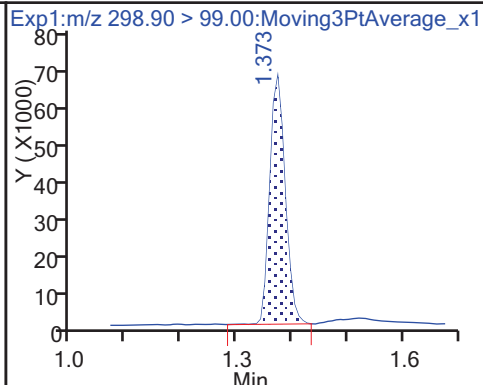
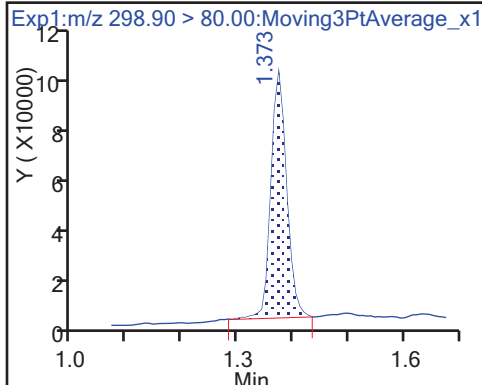
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

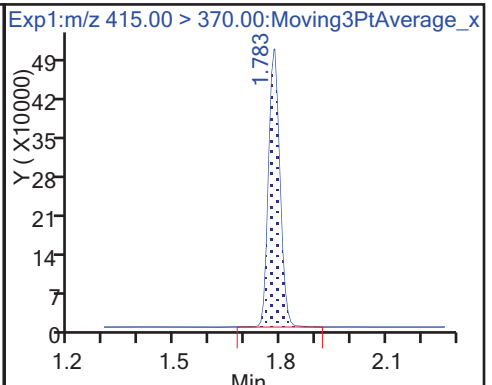
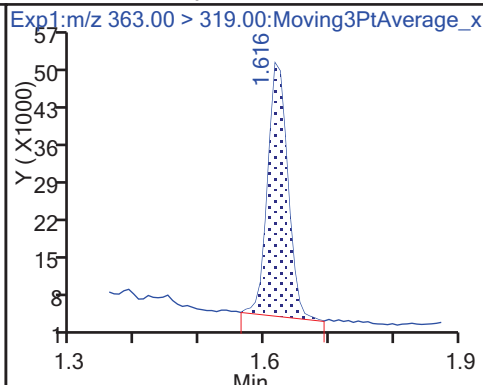
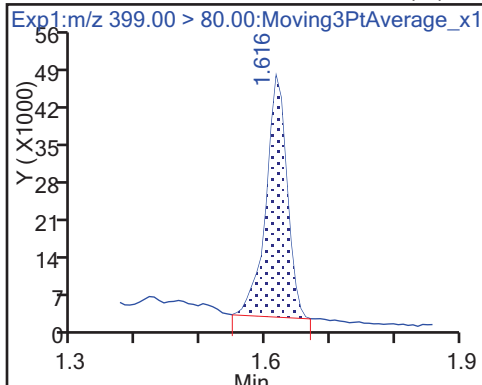
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (M)

4 Perfluoroheptanoic acid

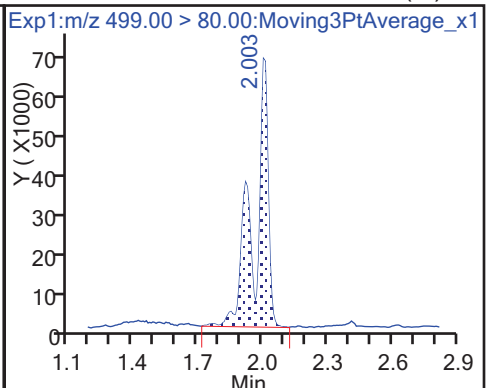
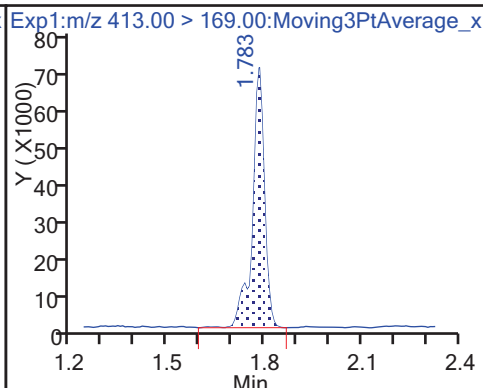
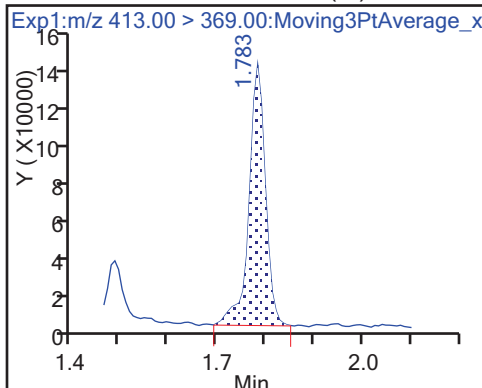
* 6 13C2-PFOA



5 Perfluorooctanoic acid (M)

5 Perfluorooctanoic acid

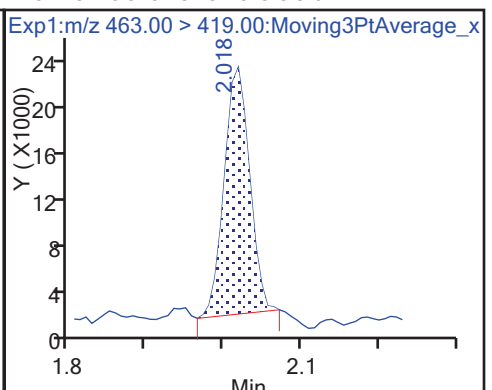
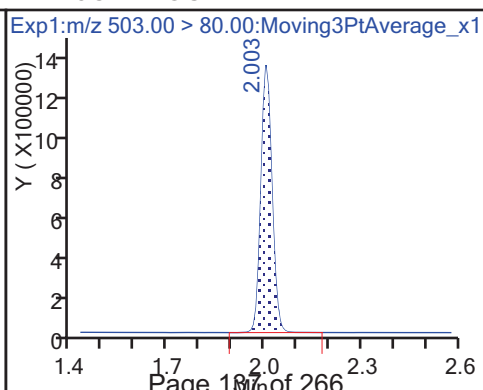
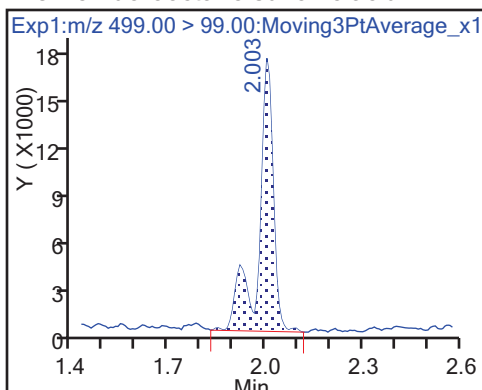
8 Perfluorooctane sulfonic acid (M)



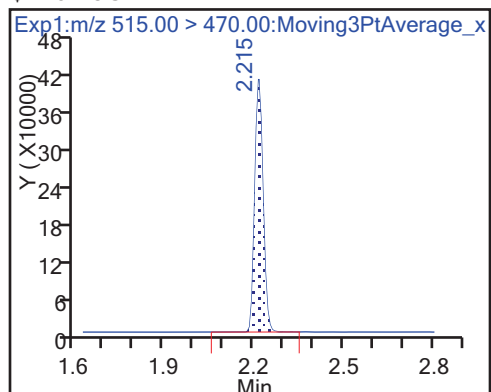
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_028.d
Lims ID: 320-36794-A-7-A
Client ID: NAWC-030518-RW-190
Sample Type: Client
Inject. Date: 15-Mar-2018 23:20:52 ALS Bottle#: 18 Worklist Smp#: 24
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-36794-a-7-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 16-Mar-2018 10:22:49 Calib Date: 15-Mar-2018 11:53:25
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d
Column 1 : Det: EXP1
Process Host: XAWRK015

First Level Reviewer: barnettj

Date: 16-Mar-2018 10:20:33

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.66	96.55
\$ 10 13C2 PFDA	10.0	11.2	111.57

TestAmerica Sacramento

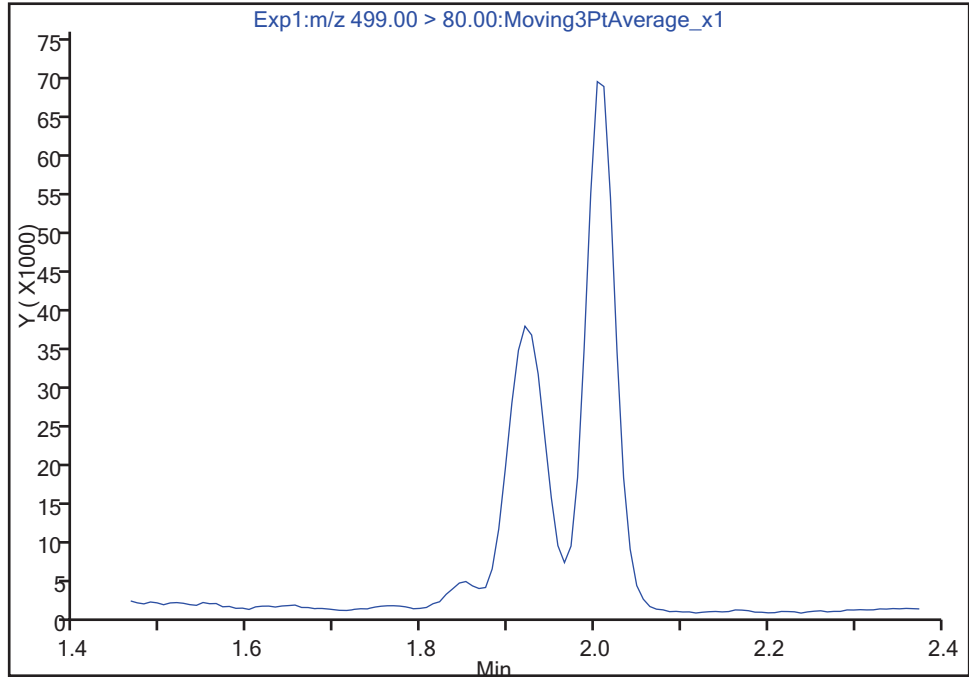
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_028.d
Injection Date: 15-Mar-2018 23:20:52 Instrument ID: A8_N
Lims ID: 320-36794-A-7-A Lab Sample ID: 320-36794-7
Client ID: NAWC-030518-RW-190
Operator ID: SACINSTLCMS01 ALS Bottle#: 18 Worklist Smp#: 24
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

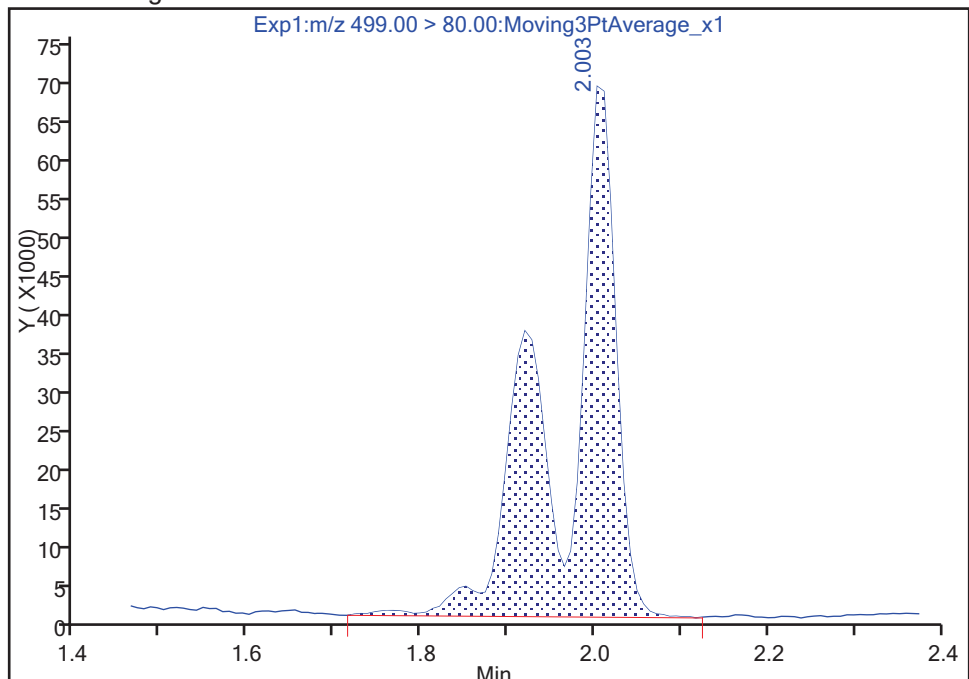
Signal: 1

Not Detected
Expected RT: 2.03

Processing Integration Results



Manual Integration Results



RT: 2.00
Area: 298874
Amount: 2.851821
Amount Units: ng/ml

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_028.d

Injection Date: 15-Mar-2018 23:20:52

Instrument ID: A8_N

Lims ID: 320-36794-A-7-A

Lab Sample ID: 320-36794-7

Client ID: NAWC-030518-RW-190

Operator ID: SACINSTLCMS01

ALS Bottle#: 18 Worklist Smp#: 24

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537_A8_N

Limit Group: LC 537 ICAL

Column:

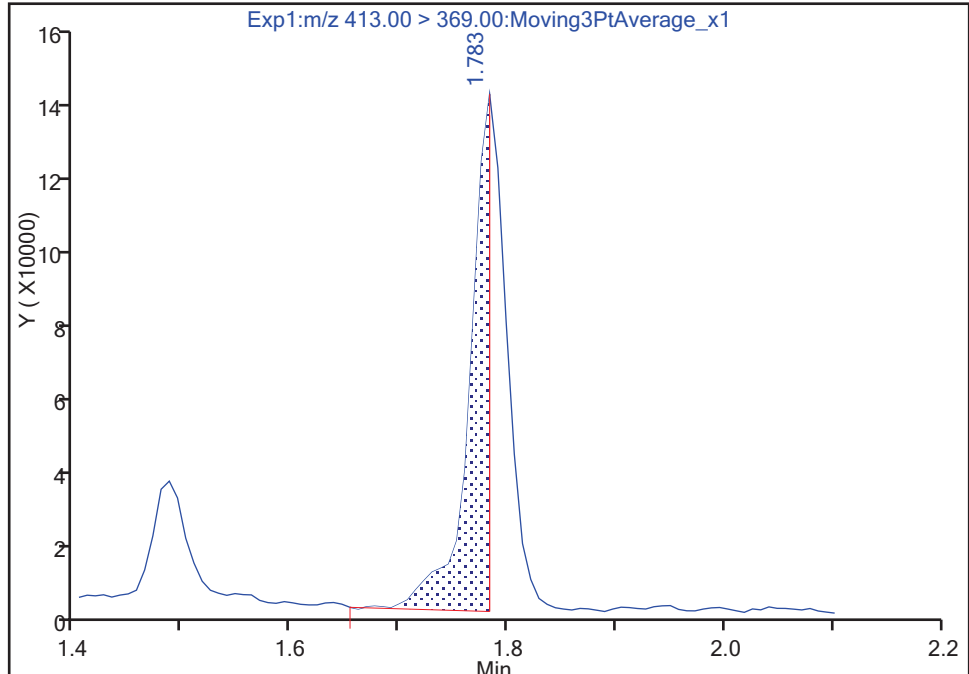
Detector: EXP1

5 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

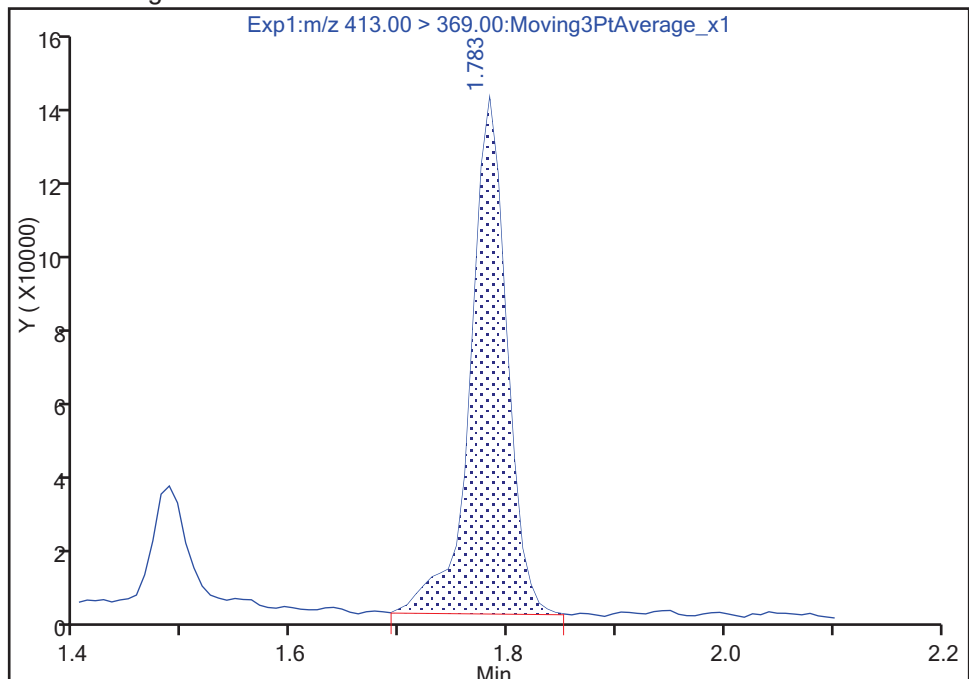
RT: 1.78
Area: 168301
Amount: 1.621051
Amount Units: ng/ml

Processing Integration Results



RT: 1.78
Area: 316727
Amount: 3.050670
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 16-Mar-2018 10:20:11

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_028.d

Injection Date: 15-Mar-2018 23:20:52

Instrument ID: A8_N

Lims ID: 320-36794-A-7-A

Lab Sample ID: 320-36794-7

Client ID: NAWC-030518-RW-190

Operator ID: SACINSTLCMS01

ALS Bottle#: 18 Worklist Smp#: 24

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537_A8_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

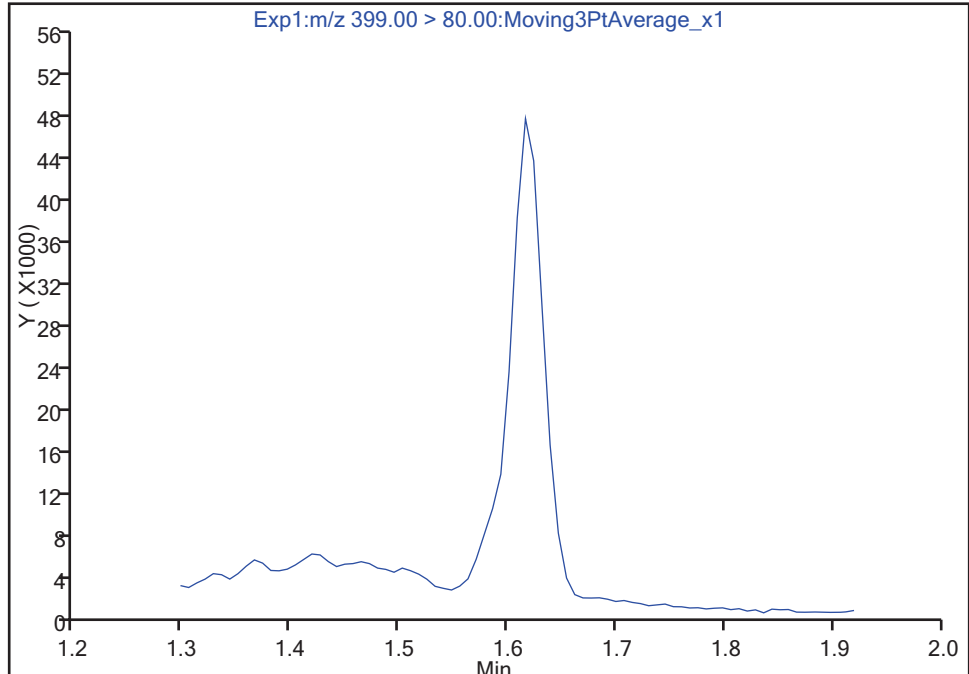
3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

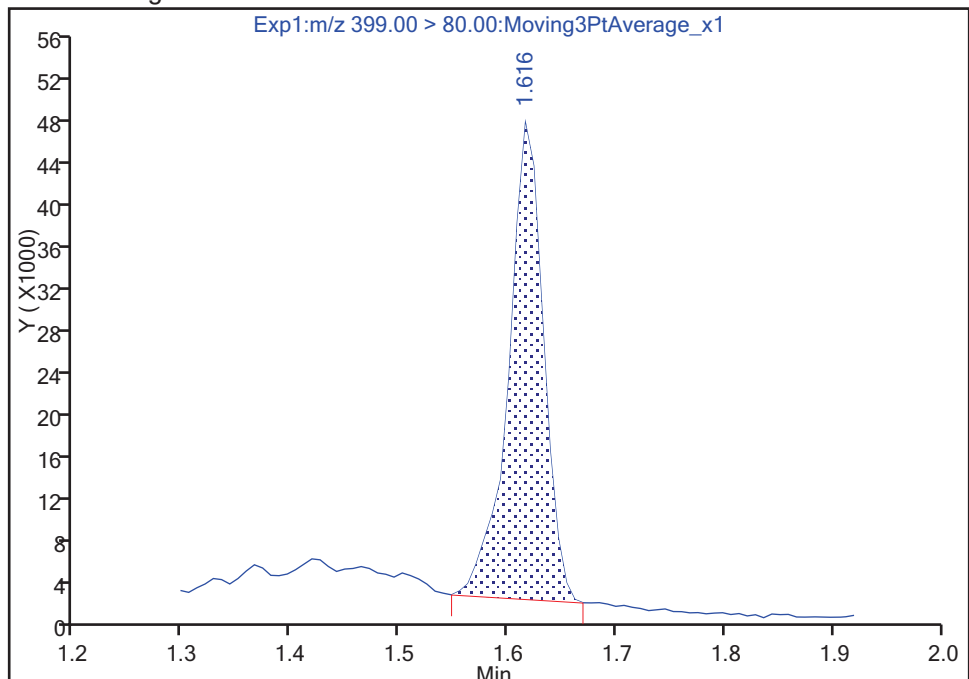
Not Detected

Expected RT: 1.62

Processing Integration Results



Manual Integration Results



RT: 1.62

Area: 100321

Amount: 0.571882

Amount Units: ng/ml

Reviewer: barnettj, 16-Mar-2018 10:19:54

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-FRB-190</u>	Lab Sample ID: <u>320-36794-8</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_031.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 11:35</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>278.4 (mL)</u>	Date Analyzed: <u>03/15/2018 23:34</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213299</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	36	14	6.1
335-67-1	Perfluorooctanoic acid (PFOA)	7.2	U	18	7.2	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	27	11	4.9
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.6	U	9.0	3.6	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	81	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	116		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_031.d
 Lims ID: 320-36794-A-8-A
 Client ID: NAWC-030518-FRB-190
 Sample Type: Client
 Inject. Date: 15-Mar-2018 23:34:56 ALS Bottle#: 21 Worklist Smp#: 27
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-36794-a-8-a
 Misc. Info.: Plate: 1 Rack: 6
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Mar-2018 10:22:49 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_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	1.487	0.0	1.000	1034172	10.1		14528	
* 6 13C2-PFOA									
415.00 > 370.00	1.783	1.791	-0.008		941171	10.0		9246	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.026	-0.015		2706073	28.7		4169	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.231	-0.008	1.000	686356	11.6		2576	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_031.d

Injection Date: 15-Mar-2018 23:34:56

Instrument ID: A8_N

Lims ID: 320-36794-A-8-A

Lab Sample ID: 320-36794-8

Client ID: NAWC-030518-FRB-190

Operator ID: SACINSTLCMS01

ALS Bottle#: 21

Worklist Smp#: 27

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

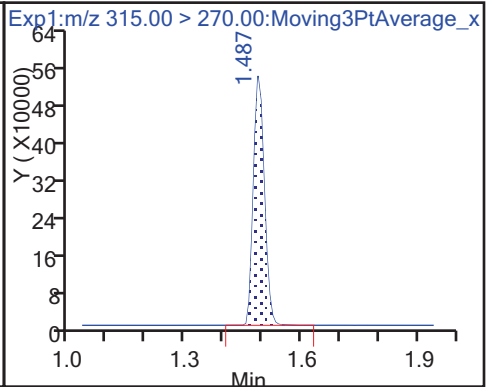
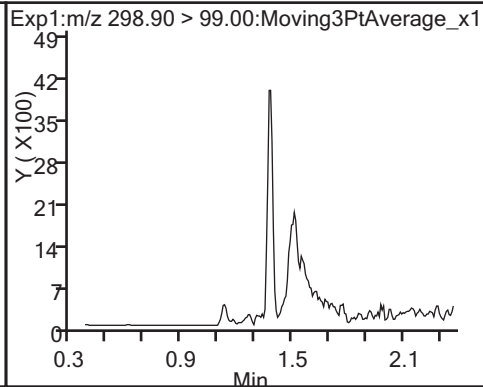
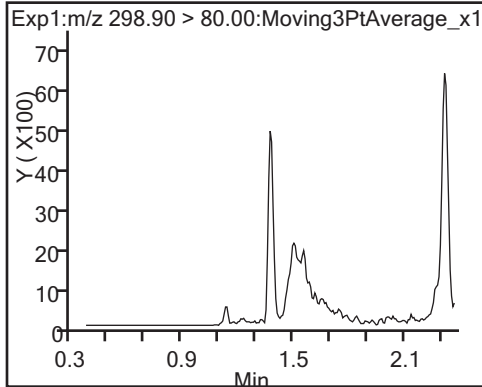
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

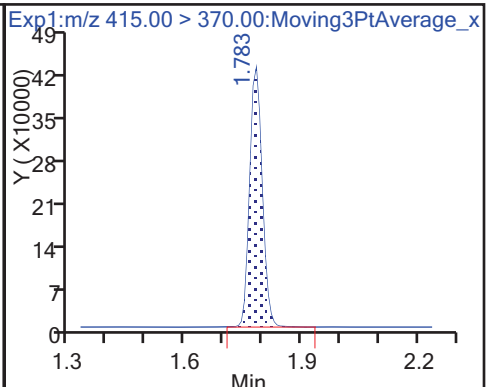
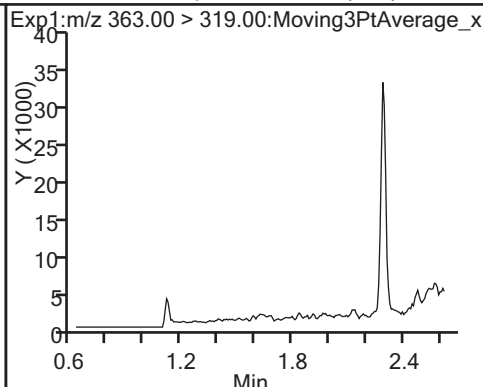
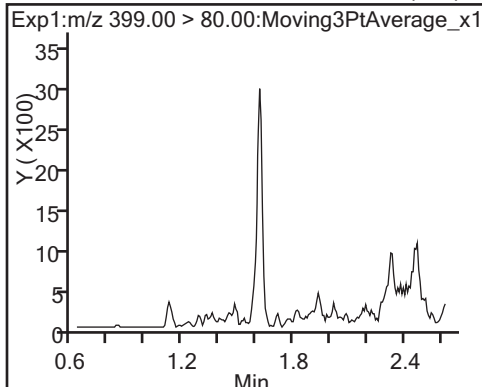
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

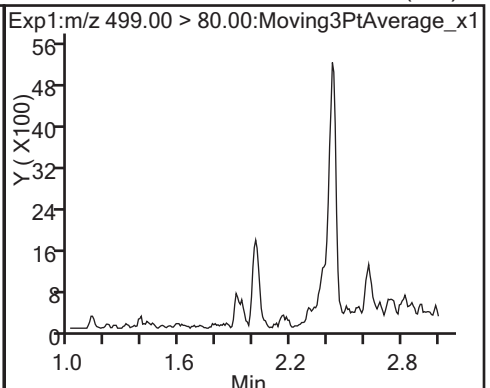
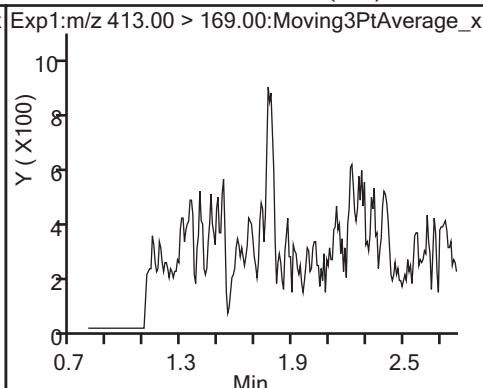
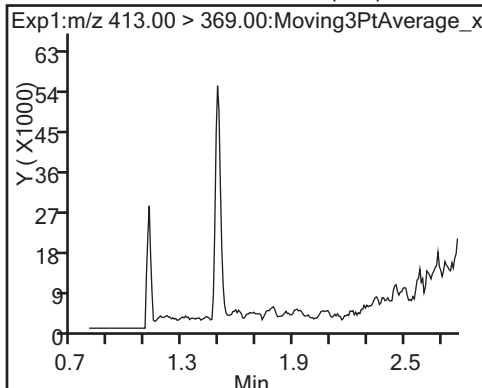
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

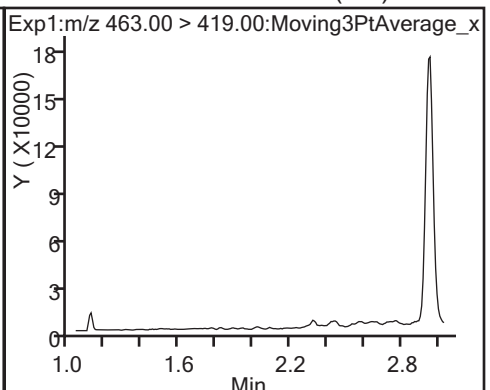
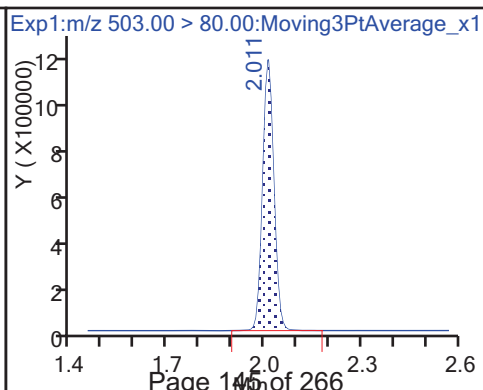
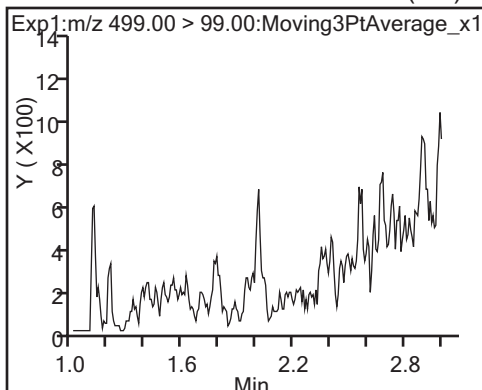
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

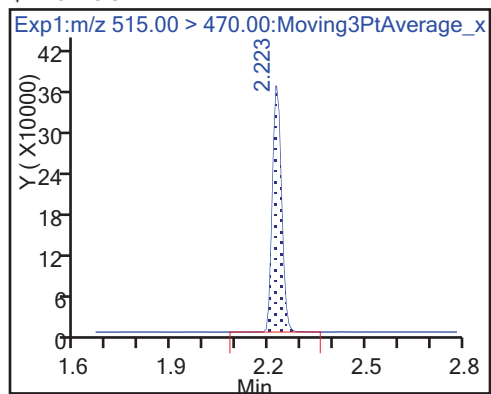


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_031.d
Lims ID: 320-36794-A-8-A
Client ID: NAWC-030518-FRB-190
Sample Type: Client
Inject. Date: 15-Mar-2018 23:34:56 ALS Bottle#: 21 Worklist Smp#: 27
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-36794-a-8-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 16-Mar-2018 10:22:49 Calib Date: 15-Mar-2018 11:53:25
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK015

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.1	100.64
\$ 10 13C2 PFDA	10.0	11.6	116.32

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

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1 Analy Batch No.: 213143

SDG No.: _____

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

Calibration Start Date: 03/15/2018 11:30 Calibration End Date: 03/15/2018 11:53 Calibration ID: 38167

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-213143/4	2018.03.15_537ICAL_004.d
Level 2	IC 320-213143/5	2018.03.15_537ICAL_005.d
Level 3	IC 320-213143/6	2018.03.15_537ICAL_006.d
Level 4	IC 320-213143/7	2018.03.15_537ICAL_007.d
Level 5	IC 320-213143/8	2018.03.15_537ICAL_008.d
Level 6	IC 320-213143/9	2018.03.15_537ICAL_009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	0.9615 0.8277	1.0154	1.0724	0.9800	0.8910	QuaF		1.1188	-0.001629						1.0000		0.9600
Perfluorohexanesulfonic acid (PFHxS)	1.4855 1.5075	1.5867	1.6850	1.6470	1.6032	Ave		1.5858				4.9		30.0			
Perfluoroheptanoic acid (PFHpA)	1.0392 0.9493	0.9927	1.0292	1.0002	1.0335	Ave		1.0073				3.4		30.0			
Perfluorooctanoic acid (PFOA)	0.9137 0.9029	0.9691	0.9597	0.9456	0.9500	Ave		0.9402				2.8		30.0			
Perfluorooctanesulfonic acid (PFOS)	0.8916 0.9324	0.9603	0.9715	0.9610	0.9676	Ave		0.9474				3.2		30.0			
Perfluorononanoic acid (PFNA)	0.7021 0.6834	0.7089	0.7427	0.7300	0.6931	Ave		0.7100				3.2		30.0			
13C2 PFHxA	1.0850 1.0881	1.1012	1.1019	1.1036	1.0712	Ave		1.0918				1.2		30.0			
13C2 PFDA	0.6169 0.6602	0.6128	0.6407	0.6046	0.6263	Ave		0.6269				3.3		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.: 320-36794-1 Analy Batch No.: 213143
SDG No.: _____
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
Calibration Start Date: 03/15/2018 11:30 Calibration End Date: 03/15/2018 11:53 Calibration ID: 38167

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-213143/4	2018.03.15_537ICAL_004.d
Level 2	IC 320-213143/5	2018.03.15_537ICAL_005.d
Level 3	IC 320-213143/6	2018.03.15_537ICAL_006.d
Level 4	IC 320-213143/7	2018.03.15_537ICAL_007.d
Level 5	IC 320-213143/8	2018.03.15_537ICAL_008.d
Level 6	IC 320-213143/9	2018.03.15_537ICAL_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	810375 13981920	1817233	4266637	8623606	12839615	9.00 180	20.0	45.0	90.0	135
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	417417 8490426	946838	2235192	4832262	7702560	3.00 60.0	6.67	15.0	30.0	45.0
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	94352 1724199	197150	453280	970758	1639248	1.00 20.0	2.22	5.00	10.0	15.0
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	166802 3297362	386975	849855	1845252	3029687	2.01 40.2	4.47	10.1	20.1	30.2
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	335376 7029722	767034	1725142	3773967	6222846	4.02 80.3	8.93	20.1	40.2	60.3
Perfluorononanoic acid (PFNA)	13PF OA	Ave	127510 2482937	281632	654246	1417278	2198770	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PF OA	Ave	984815 988034	983949	970362	1070945	1132420	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	559893 599445	547551	564249	586726	662151	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD
QuaF = Quadratic ISTD forced zero

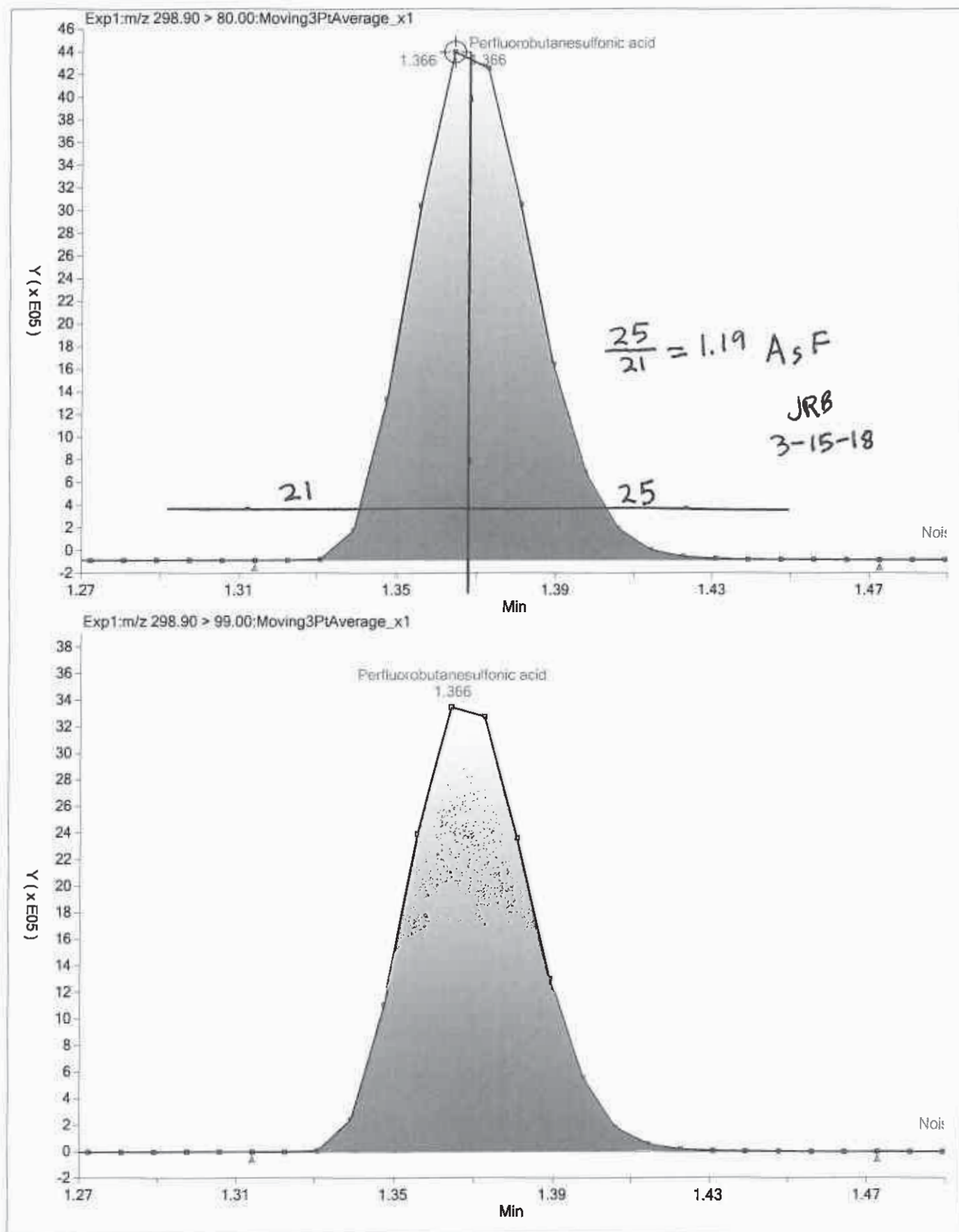
FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

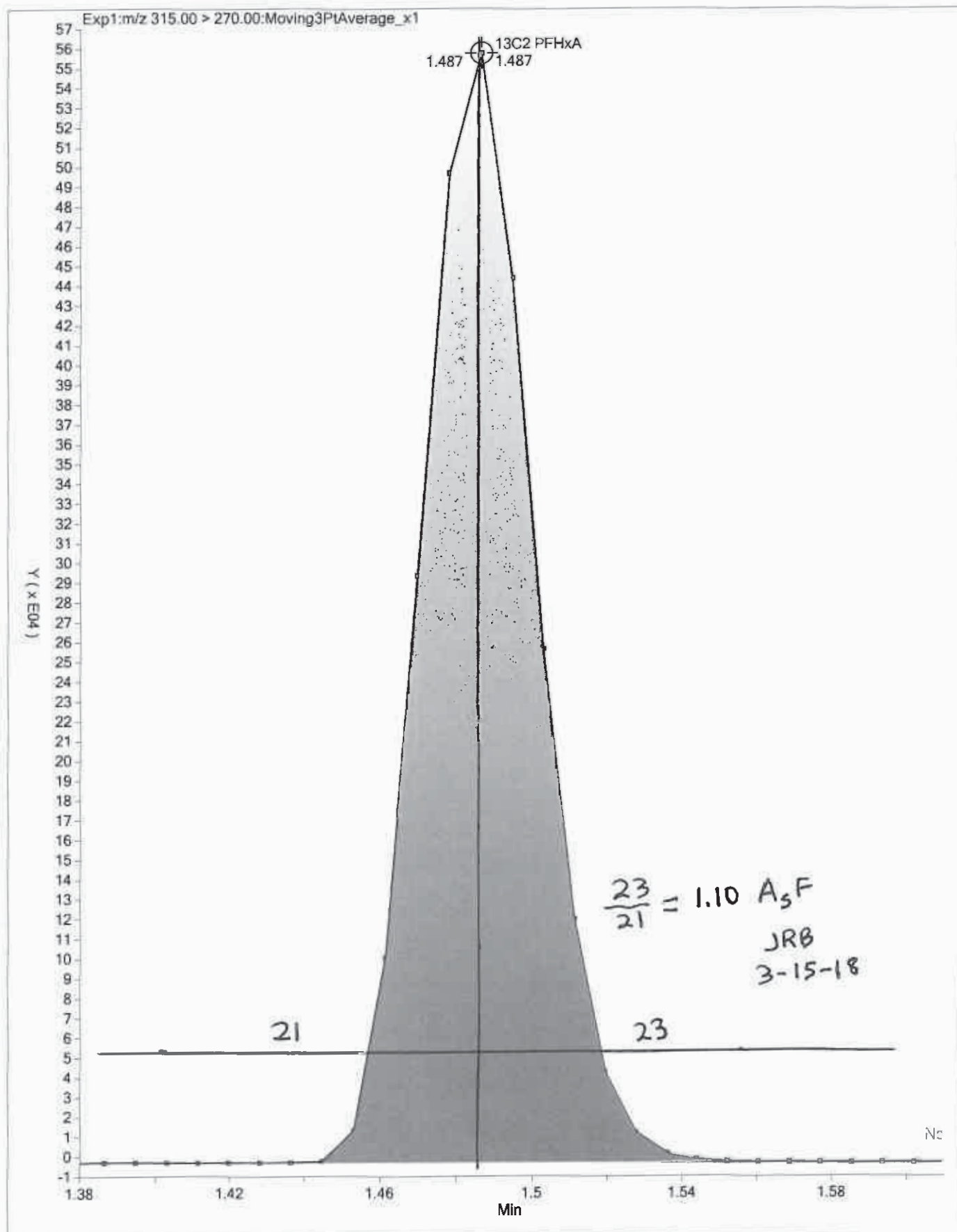
Lab Name: TestAmerica Sacramento Job No.: 320-36794-1 Analy Batch No.: 213143
SDG No.: _____
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
Calibration Start Date: 03/15/2018 11:30 Calibration End Date: 03/15/2018 11:53 Calibration ID: 38167

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-213143/4	2018.03.15_537ICAL_004.d
Level 2	IC 320-213143/5	2018.03.15_537ICAL_005.d
Level 3	IC 320-213143/6	2018.03.15_537ICAL_006.d
Level 4	IC 320-213143/7	2018.03.15_537ICAL_007.d
Level 5	IC 320-213143/8	2018.03.15_537ICAL_008.d
Level 6	IC 320-213143/9	2018.03.15_537ICAL_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)	-13.1	-6.7	2.8	0.9	-1.2	0.4	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	-6.3	0.1	6.3	3.9	1.1	-4.9	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	3.2	-1.5	2.2	-0.7	2.6	-5.8	50	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	-2.8	3.1	2.1	0.6	1.0	-4.0	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-5.9	1.4	2.5	1.4	2.1	-1.6	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-1.1	-0.2	4.6	2.8	-2.4	-3.8	50	30	30	30	30	30
13C2 PFHxA	-0.6	0.9	0.9	1.1	-1.9	-0.3	30	30	30	30	30	30
13C2 PFDA	-1.6	-2.3	2.2	-3.6	-0.1	5.3	30	30	30	30	30	30





TestAmerica Laboratories
Istd/Surrogate Recovery Report

Worklist Name: 14MAR2018A_537_ICAL

Worklist Num: 55366

Instrument: A8_N

Method: 537_A8_N

Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b

Limit Group: LC 537 ICAI

Analysis Type: SemiVOA

Inj Volume: 2.00

Inj Vol Units: ul

Lims Batch: 213143

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				942957 1.80	774128 2.04
# 1 RB	15-Mar-2018 11:15:59			931977 98.8 1.81	2623406> 338.9* 2.04
# 2 RB	15-Mar-2018 11:20:41			889728 94.4 1.81	2464820> 318.4* 2.06
# 3 RB	15-Mar-2018 11:25:25			1035289 109.8 1.80	2987398> 385.9* 2.03
IS Std					
# 4 IC L1	15-Mar-2018 11:30:04	1.49 99.38	2.23 98.40	907654> 100.0* 1.80	2685159> 100.0* 2.03
# 5 IC L2	15-Mar-2018 11:34:44	1.50 100.90	2.22 97.75	893553> 98.4* 1.79	2566276> 95.6* 2.01
# 6 IC L3	15-Mar-2018 11:39:24	1.50 100.90	2.22 102.20	880660> 97.0* 1.79	2535541> 94.4* 2.01
# 7 IC L4	15-Mar-2018 11:44:04	1.49 101.10	2.23 96.45	970381> 106.9* 1.80	2803911> 104.4* 2.03
# 8 IC L5	15-Mar-2018 11:48:46	1.49 98.11	2.22 99.91	1057188> 116.5* 1.79	3061123> 114.0* 2.02
# 9 IC L6	15-Mar-2018 11:53:25	1.50 99.66	2.22 105.30	908006> 100.0* 1.80	2691309> 100.2* 2.01
IS Std				880660 1.79	2535541 2.01
#10 RB	15-Mar-2018 11:58:05			862886 98.0 1.78	2538901 100.1 2.02
IS Std				970381 1.80	2803911 2.03
#11 CCVL	15-Mar-2018 12:02:46	1.49 98.81	2.22 93.73	897894 92.5 1.79	2561754 91.4 2.02
IS Std				897894 1.79	2561754 2.02
#12 RB	15-Mar-2018 12:07:26			882538 98.3 1.77	2649606 103.4 1.93
IS Std				970381 1.80	
#13 ICV	15-Mar-2018 12:12:05	1.50 107.50		763341 78.7 1.64	
#14 RB	15-Mar-2018 12:16:45				

13C2-PFDA

$$RPD = \frac{1057188 - 880660}{\left(\frac{1057188 + 880660}{2} \right)} \times 100 = 18.2$$

13C4-PFOS

$$RPD = \frac{3061123 - 2535541}{\left(\frac{3061123 + 2535541}{2} \right)} \times 100 = 18.8$$

JRB 3-15-18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_004.d
 Lims ID: IC L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 15-Mar-2018 11:30:04 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\20180315-55366.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 15-Mar-2018 14:05:59 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: barnettj

Date: 15-Mar-2018 13:24:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.376	-0.003	1.000	810375	7.83		1641	
298.90 > 99.00	1.373	1.376	-0.003	1.000	616077		1.32(0.00-0.00)	1454	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.487	1.491	-0.004	1.000	984815	9.94		13386	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.624	0.0	1.000	417417	2.81		1398	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.626	-0.002	1.000	94352	1.03		19.7	
* 6 13C2-PFOA									
415.00 > 370.00	1.798	1.794	0.004		907654	10.0		9493	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.798	1.794	0.004	1.000	166802	1.95		7.9	
413.00 > 169.00	1.798	1.794	0.004	1.000	90253		1.85(0.00-0.00)	119	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.026	2.018	0.008	1.000	335376	3.78		464	a
499.00 > 99.00	2.026	2.018	0.008	1.000	71735		4.68(0.00-0.00)	70.5	a
* 7 13C4 PFOS									
503.00 > 80.00	2.026	2.018	0.008		2685159	28.7		6409	
9 Perfluorononanoic acid									
463.00 > 419.00	2.033	2.031	0.002	1.000	127510	1.98		16.3	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.231	2.223	0.008	1.000	559893	9.84		1676	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

LC537-L1_00021

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_004.d

Injection Date: 15-Mar-2018 11:30:04

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

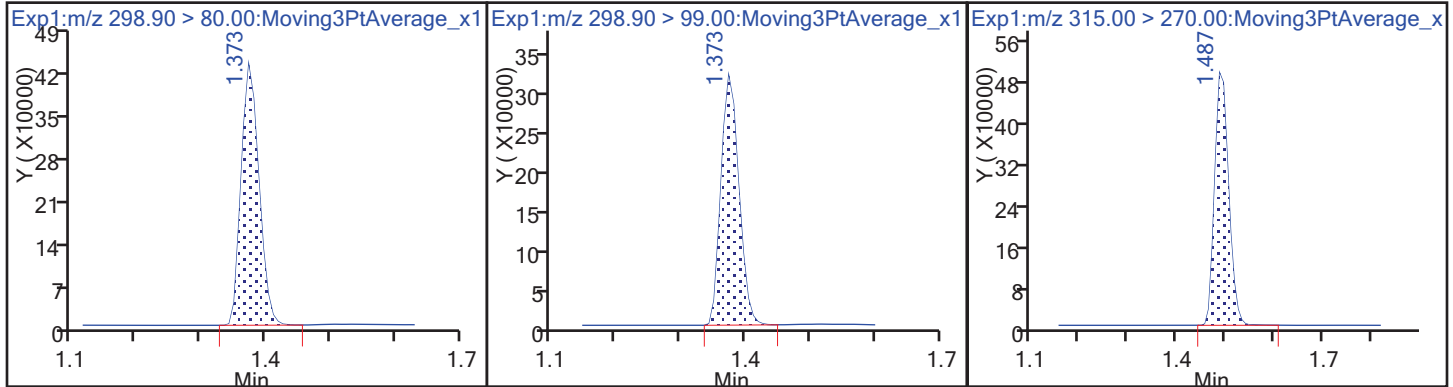
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

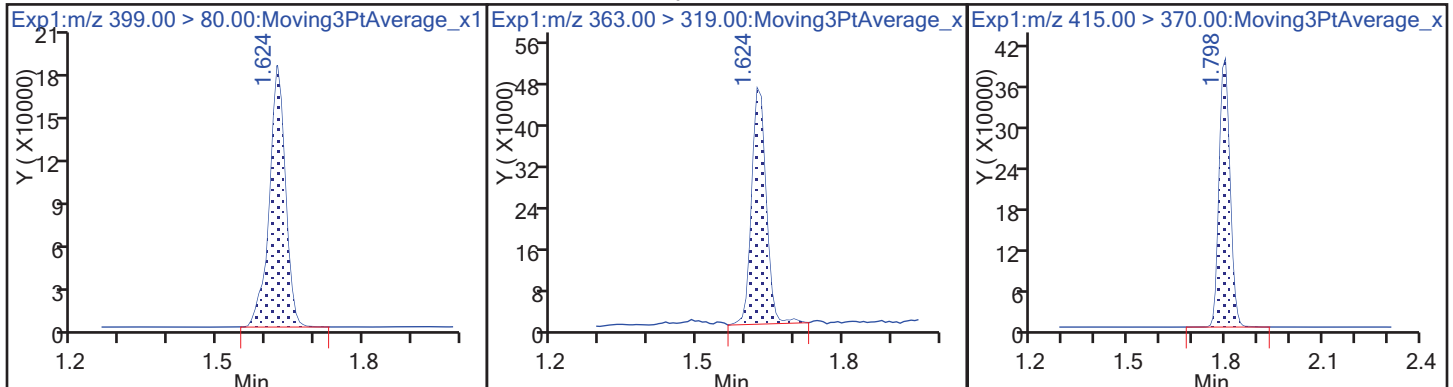
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

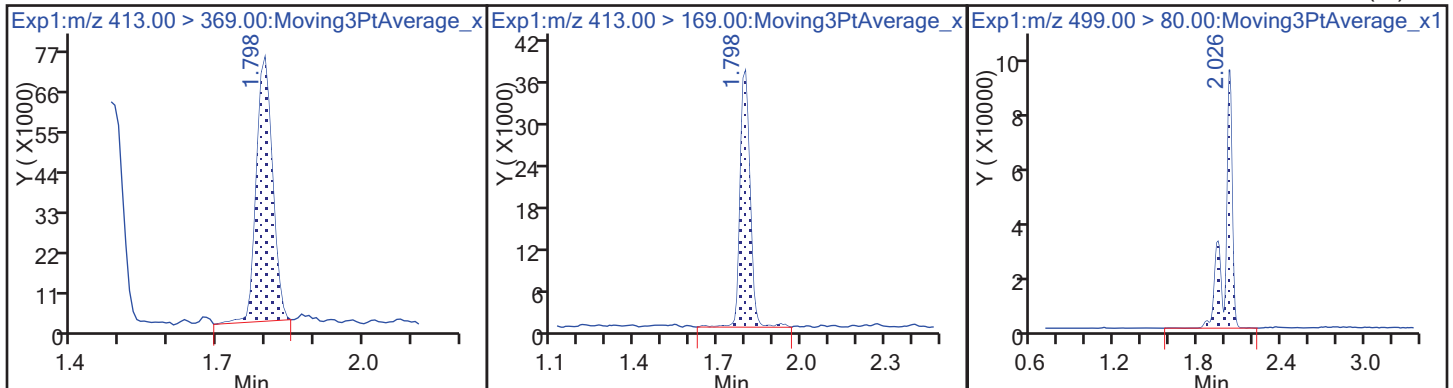
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

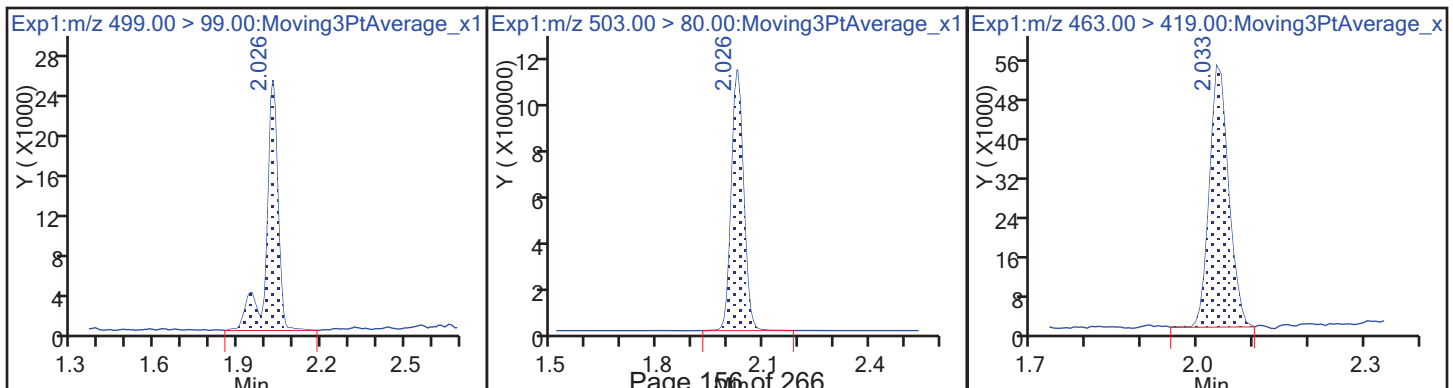
8 Perfluorooctane sulfonic acid (M)



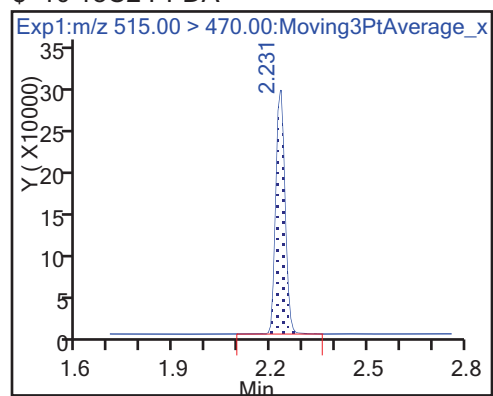
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

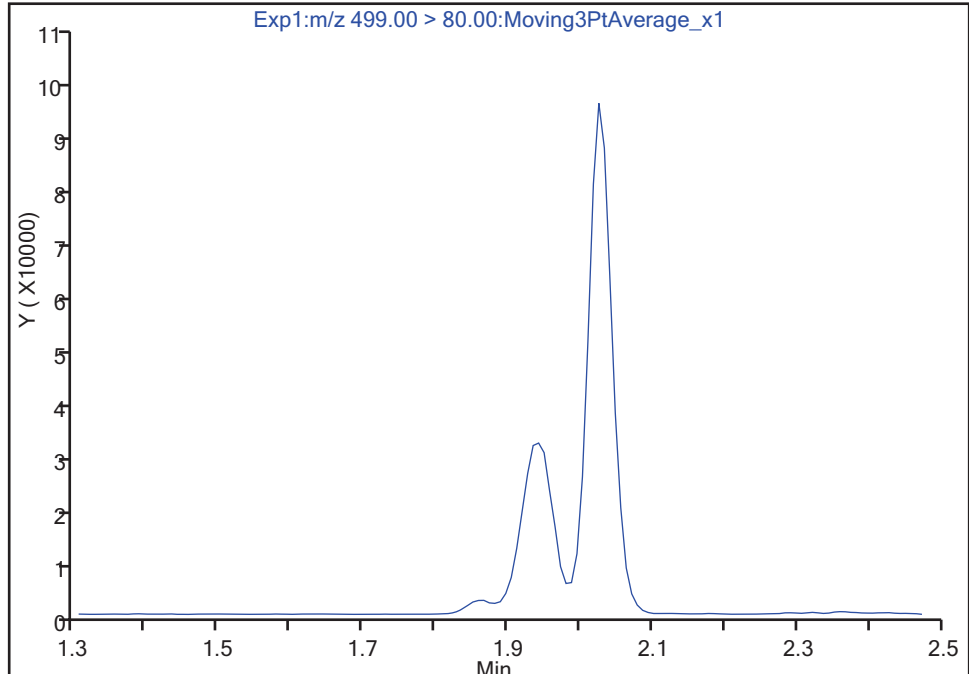
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_004.d
Injection Date: 15-Mar-2018 11:30:04 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

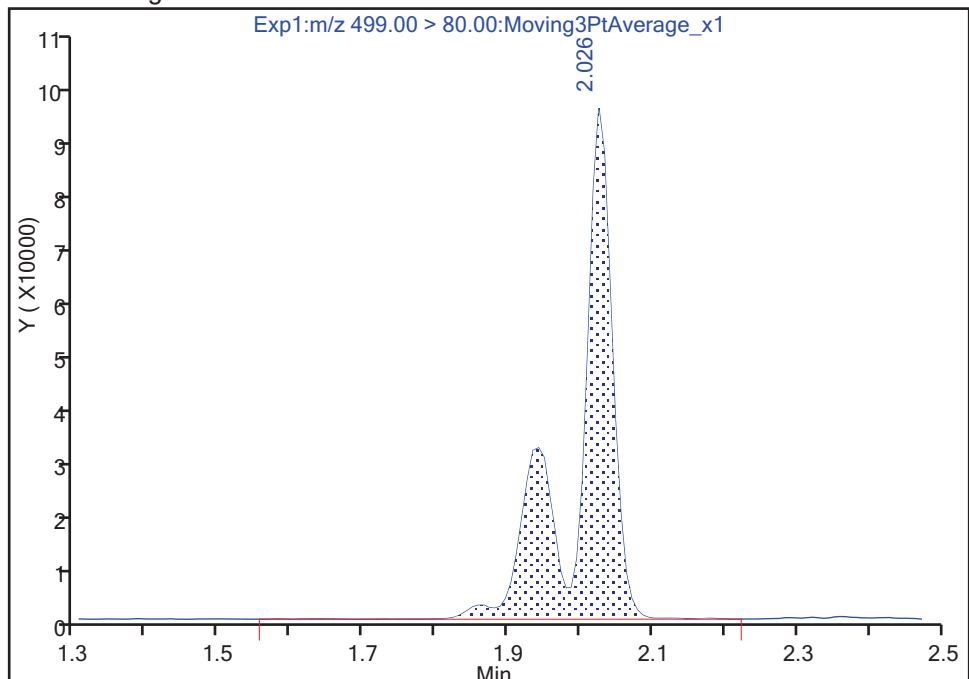
Not Detected
Expected RT: 2.02

Processing Integration Results



Manual Integration Results

RT: 2.03
Area: 335376
Amount: 3.781033
Amount Units: ng/ml



Reviewer: barnettj, 15-Mar-2018 13:24:29

Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_005.d
 Lims ID: IC L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 15-Mar-2018 11:34:44 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\20180315-55366.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 15-Mar-2018 14:06:00 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: barnettj

Date: 15-Mar-2018 13:24:46

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.376	0.005	1.000	1817233	18.7		3462	
298.90 > 99.00	1.381	1.376	0.005	1.000	1429073		1.27(0.00-0.00)	3149	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.491	0.004	1.000	983949	10.1		11934	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.624	0.0	1.000	946838	6.67		3147	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.626	-0.002	1.000	197150	2.19		44.9	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.791	1.794	-0.003	1.000	386975	4.61		17.5	
413.00 > 169.00	1.791	1.794	-0.003	1.000	208852		1.85(0.00-0.00)	301	
* 6 13C2-PFOA									
415.00 > 370.00	1.791	1.794	-0.003		893553	10.0		9125	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.011	2.018	-0.007	1.000	767034	9.05		1005	a
499.00 > 99.00	2.011	2.018	-0.007	1.000	162762		4.71(0.00-0.00)	157	a
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.018	-0.007		2566276	28.7		6799	
9 Perfluorononanoic acid									
463.00 > 419.00	2.026	2.031	-0.005	1.000	281632	4.44		37.6	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.223	0.0	1.000	547551	9.77		1807	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

LC537-L2_00021

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_005.d

Injection Date: 15-Mar-2018 11:34:44

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

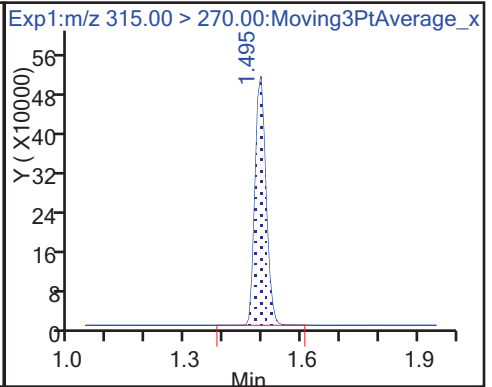
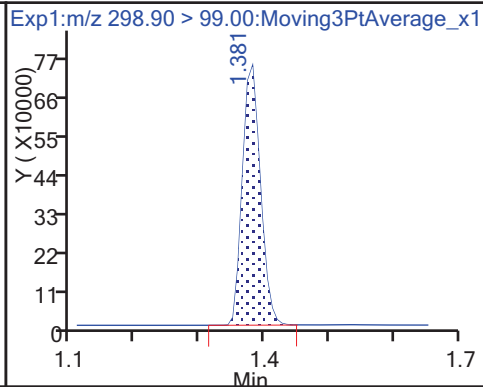
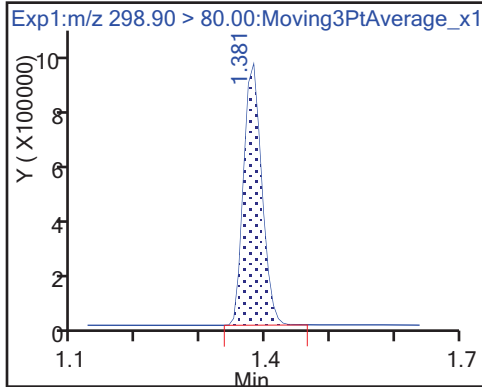
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

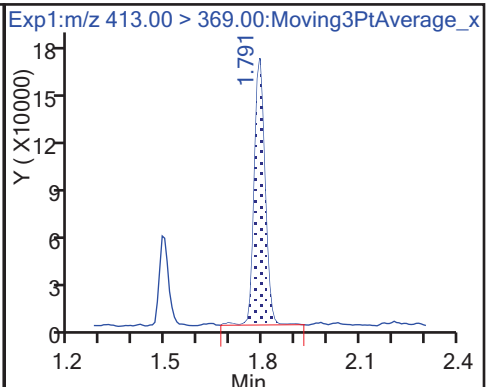
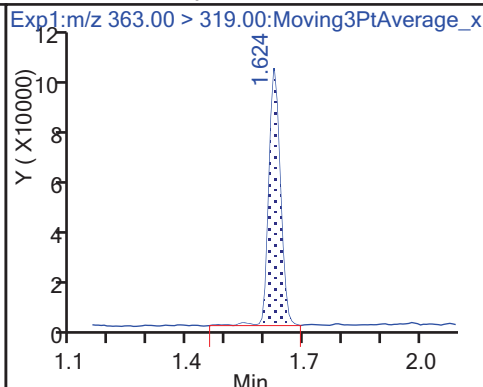
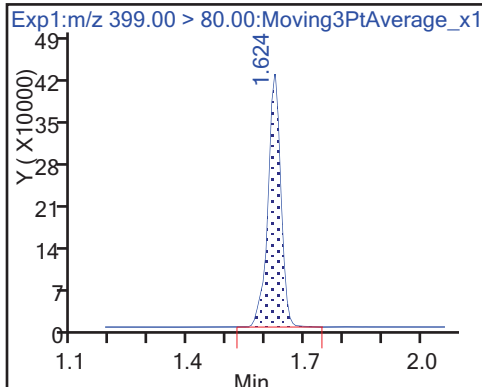
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

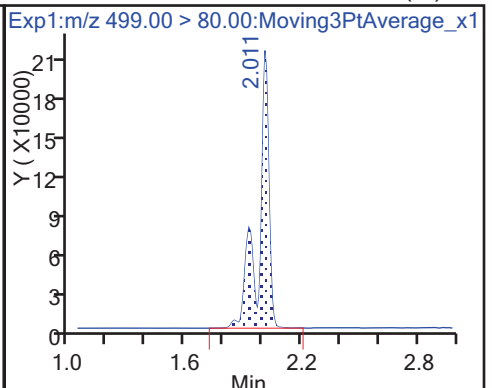
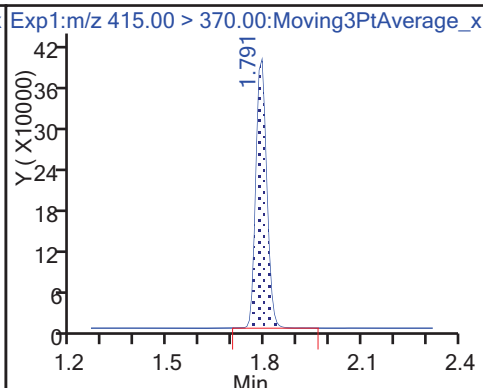
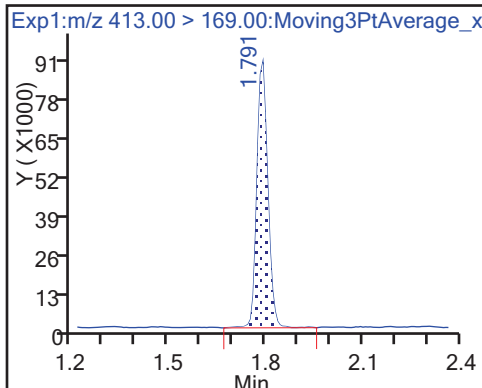
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

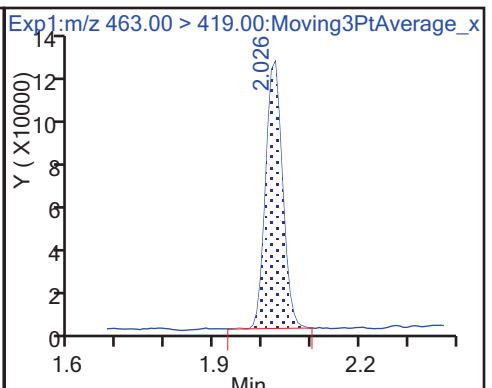
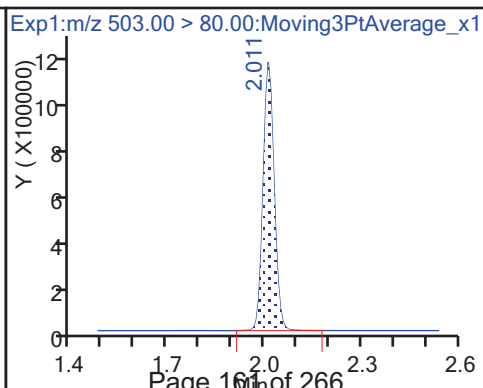
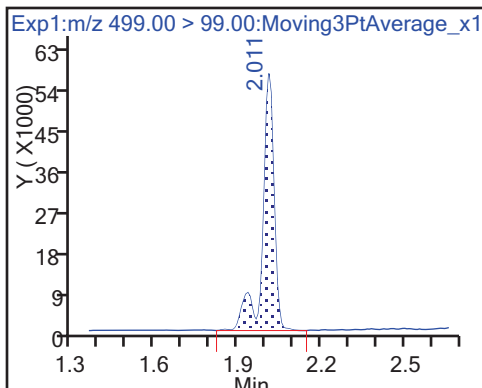
8 Perfluorooctane sulfonic acid (M)



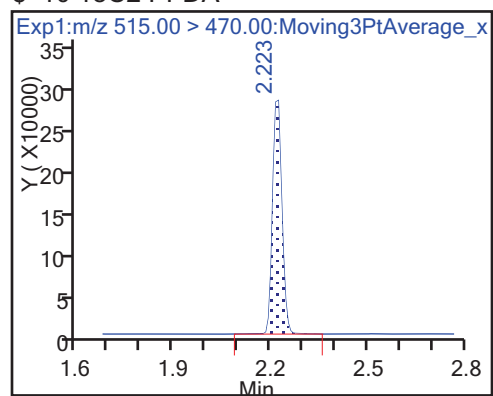
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

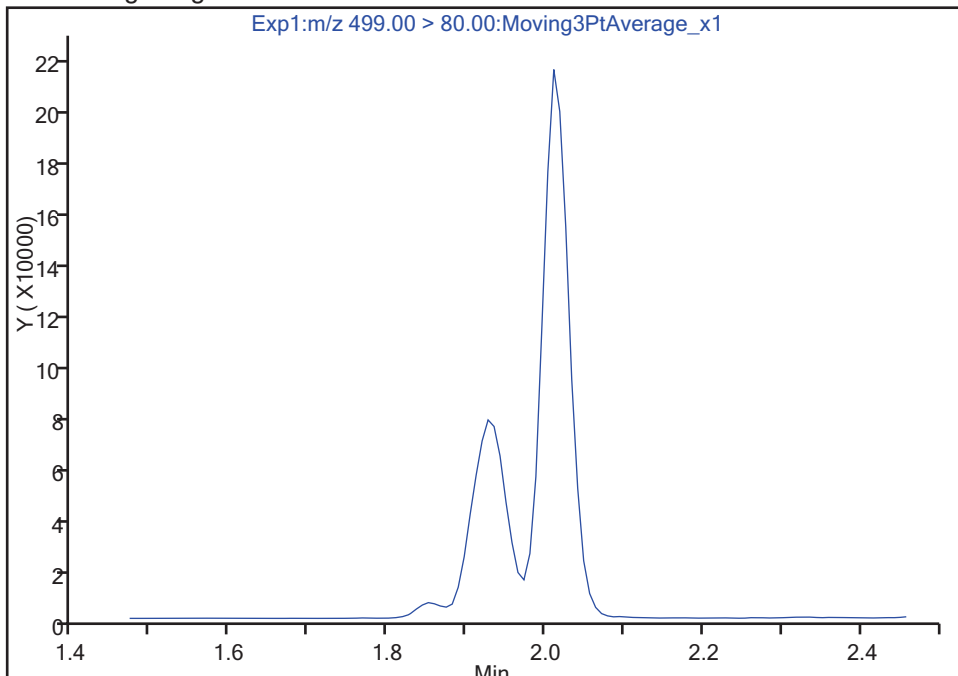
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_005.d
Injection Date: 15-Mar-2018 11:34:44 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

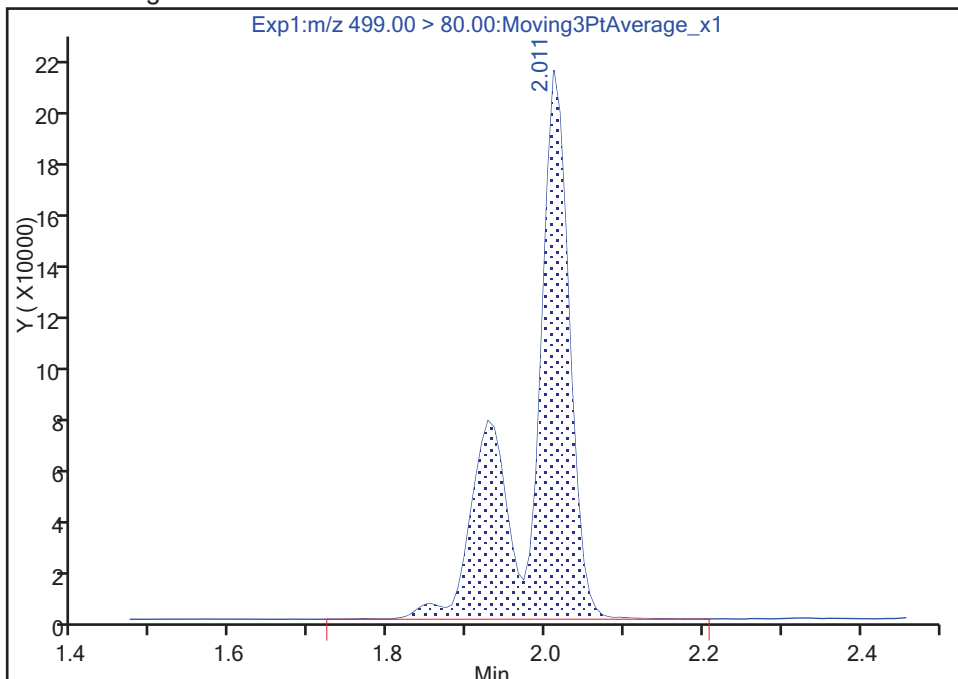
Not Detected
Expected RT: 2.02

Processing Integration Results



RT: 2.01
Area: 767034
Amount: 9.048150
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 15-Mar-2018 13:24:39

Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_006.d
 Lims ID: IC L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 15-Mar-2018 11:39:24 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\20180315-55366.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 15-Mar-2018 14:06:01 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: barnettj

Date: 15-Mar-2018 13:24:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.376	0.005	1.000	4266637	46.2		9432	
298.90 > 99.00	1.381	1.376	0.005	1.000	3127311		1.36(0.00-0.00)	6783	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.491	0.004	1.000	970362	10.1		13159	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.624	0.0	1.000	2235192	15.9		6184	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.631	1.626	0.005	1.000	453280	5.11		105	
* 6 13C2-PFOA									
415.00 > 370.00	1.791	1.794	-0.003		880660	10.0		8737	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.791	1.794	-0.003	1.000	849855	10.3		38.2	
413.00 > 169.00	1.791	1.794	-0.003	1.000	467295		1.82(0.00-0.00)	732	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.018	2.018	0.0	1.000	1725142	20.6		2980	a
499.00 > 99.00	2.011	2.018	-0.007	0.996	362350		4.76(0.00-0.00)	289	a
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.018	-0.007		2535541	28.7		6368	
9 Perfluorononanoic acid									
463.00 > 419.00	2.026	2.031	-0.005	1.000	654246	10.5		92.8	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.223	-0.008	1.000	564249	10.2		1881	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

LC537-L3_00024

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_006.d

Injection Date: 15-Mar-2018 11:39:24

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

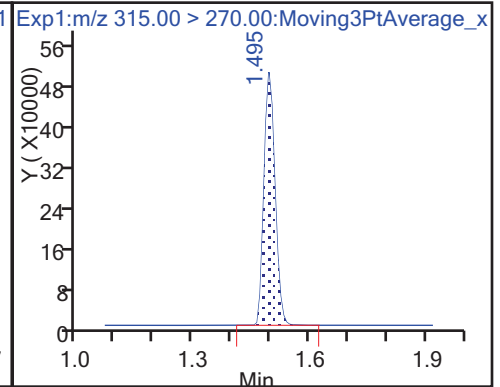
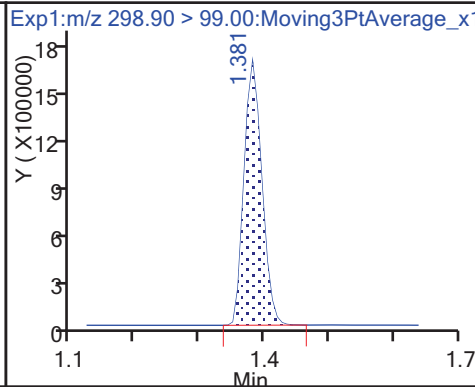
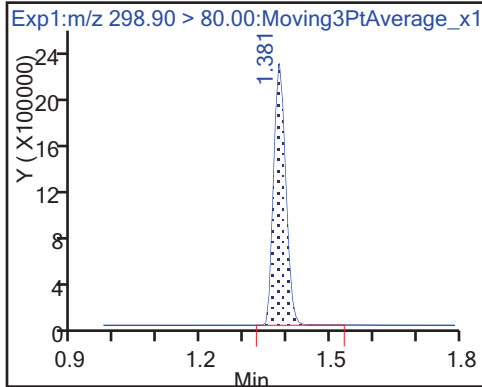
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

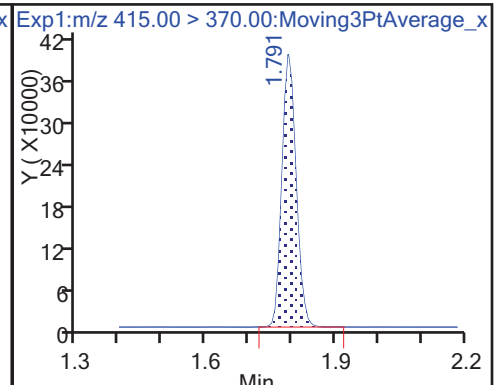
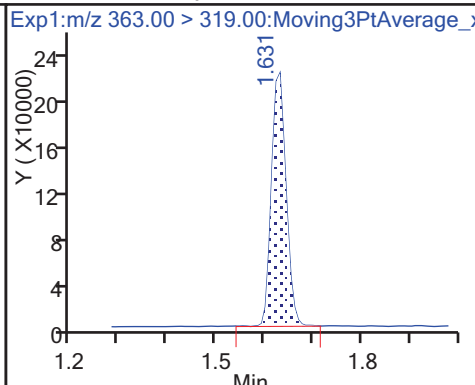
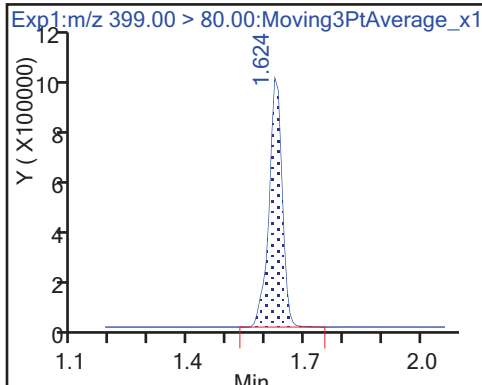
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

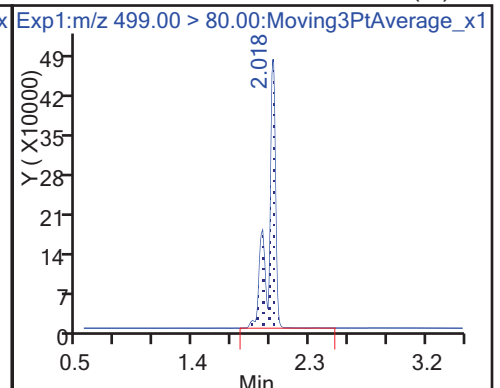
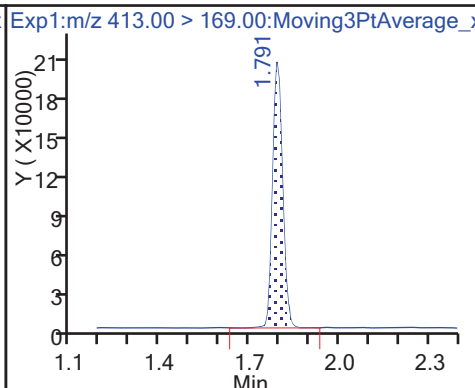
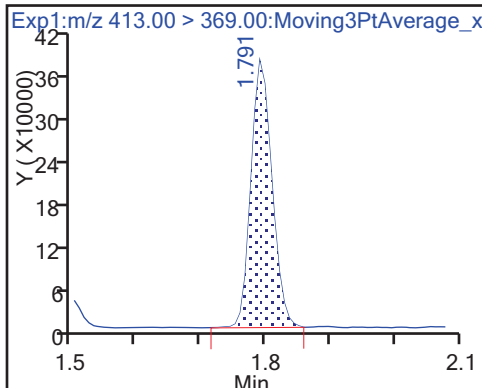
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

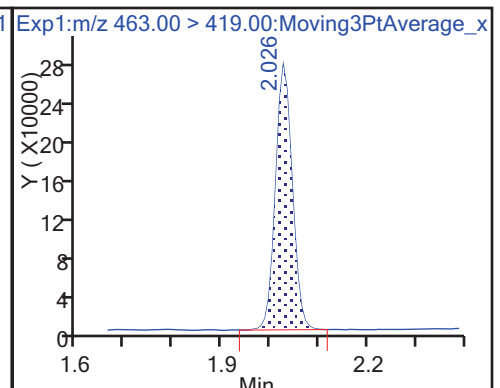
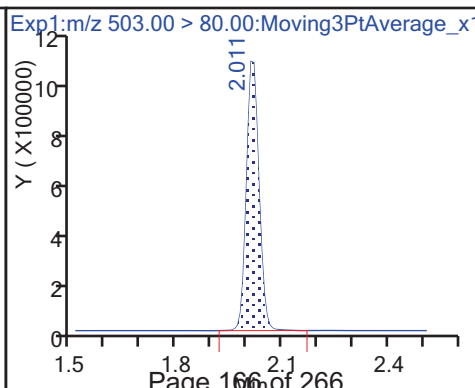
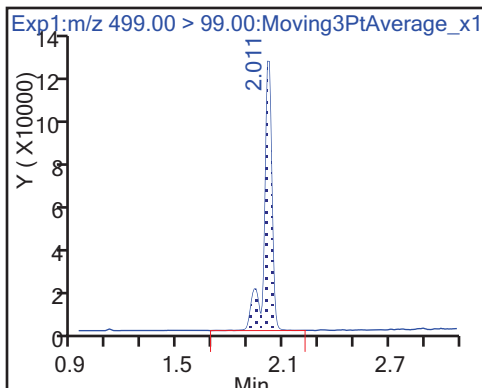
8 Perfluorooctane sulfonic acid (M)



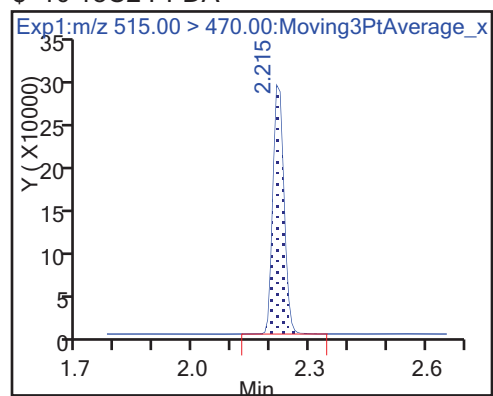
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

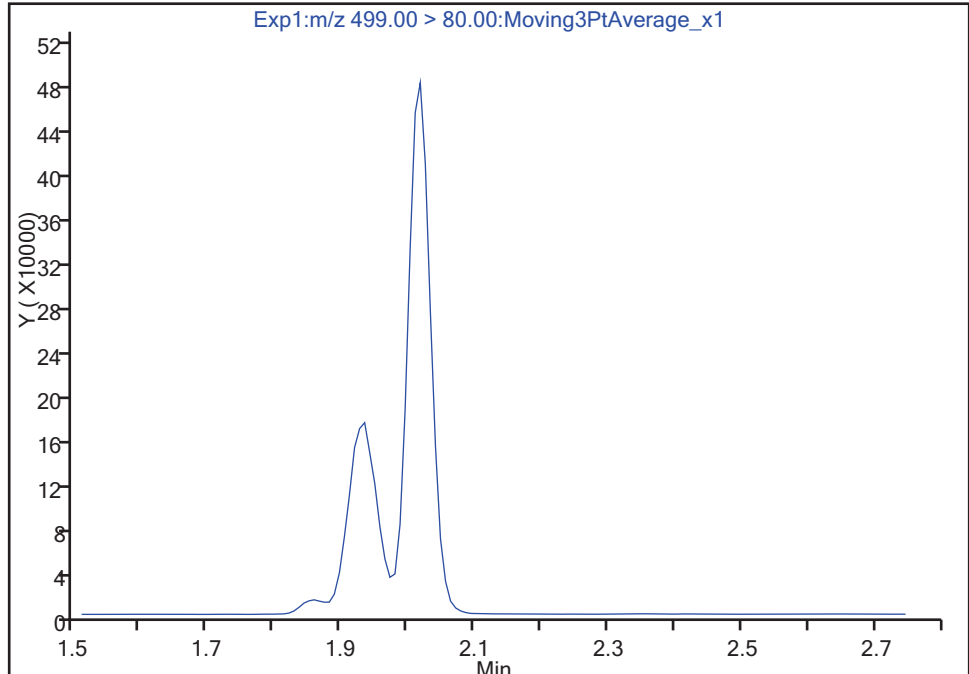
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_006.d
Injection Date: 15-Mar-2018 11:39:24 Instrument ID: A8_N
Lims ID: IC L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

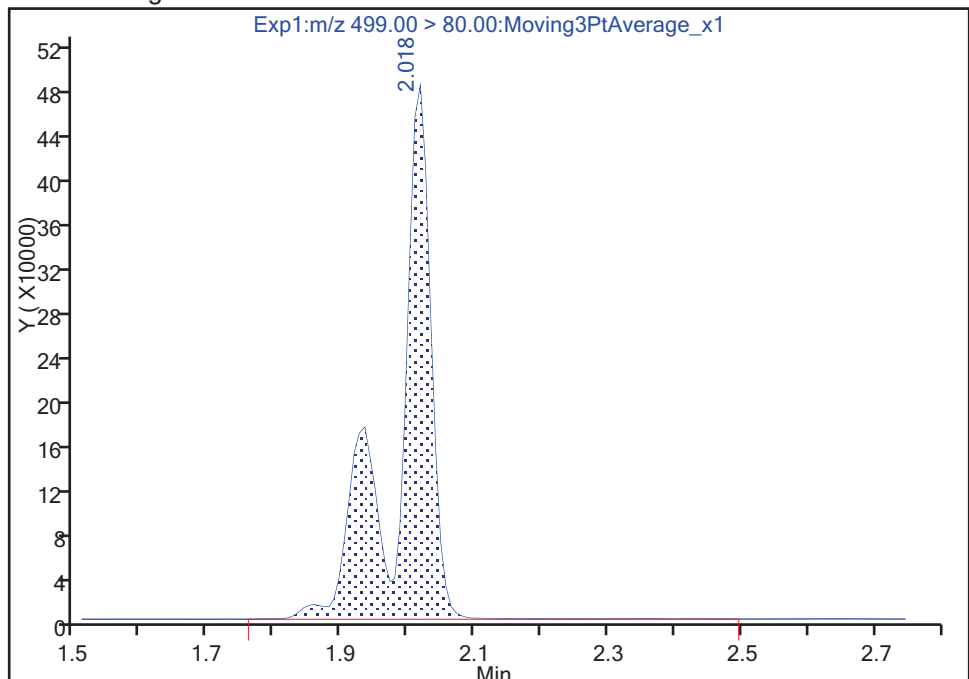
Not Detected
Expected RT: 2.02

Processing Integration Results



RT: 2.02
Area: 1725142
Amount: 20.596942
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 15-Mar-2018 13:24:16
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_007.d
 Lims ID: IC L4
 Client ID:
 Sample Type: ICISAV Calib Level: 4
 Inject. Date: 15-Mar-2018 11:44:04 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\20180315-55366.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 15-Mar-2018 14:06:02 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: barnettj

Date: 15-Mar-2018 13:25:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.366	1.376	-0.010	1.000	8623606	90.9		14271	
298.90 > 99.00	1.366	1.376	-0.010	1.000	6697384		1.29(0.00-0.00)	12090	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.487	1.491	-0.004	1.000	1070945	10.1		12320	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.624	0.0	1.000	4832262	31.2		12845	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.626	-0.002	1.000	970758	9.93		213	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.798	1.794	0.004	1.000	1845252	20.2		80.2	
413.00 > 169.00	1.798	1.794	0.004	1.000	1026169		1.80(0.00-0.00)	1557	
* 6 13C2-PFOA									
415.00 > 370.00	1.798	1.794	0.004		970381	10.0		9570	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.041	2.018	0.023	1.000	3773967	40.7		5251	a
499.00 > 99.00	2.033	2.018	0.015	0.996	790631		4.77(0.00-0.00)	745	a
* 7 13C4 PFOS									
503.00 > 80.00	2.033	2.018	0.015		2803911	28.7		7515	
9 Perfluorononanoic acid									
463.00 > 419.00	2.048	2.031	0.017	1.000	1417278	20.6		189	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.231	2.223	0.008	1.000	586726	9.64		1974	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

LC537-L4_00021

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_007.d

Injection Date: 15-Mar-2018 11:44:04

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

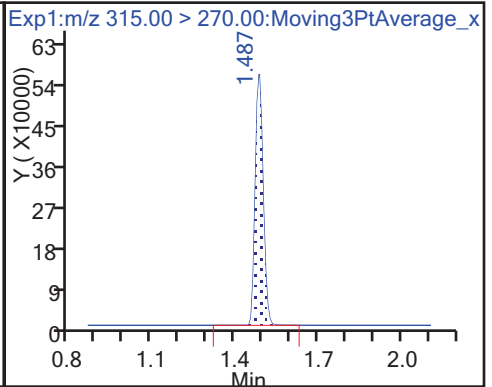
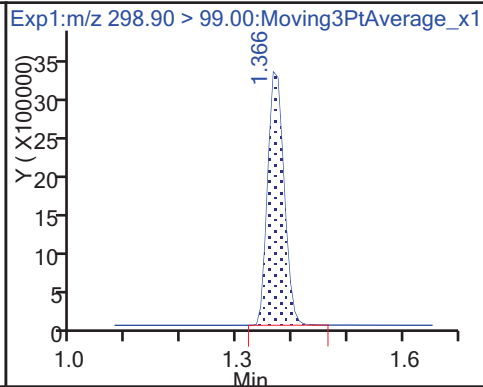
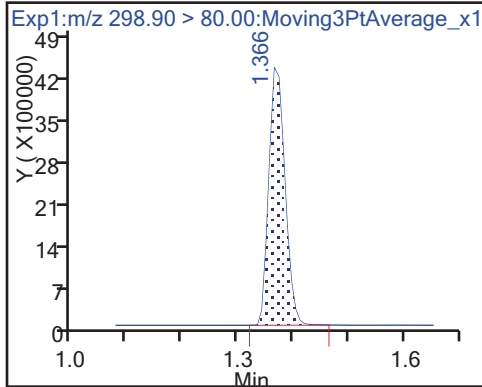
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

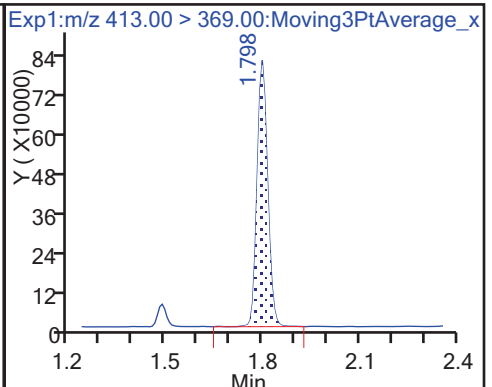
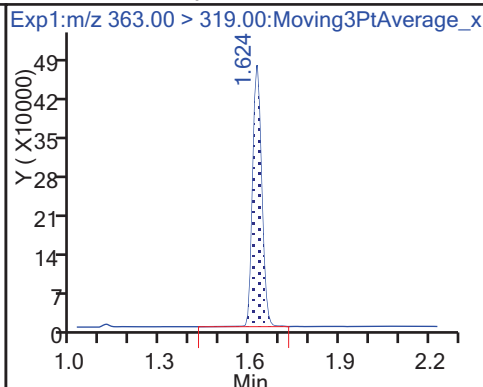
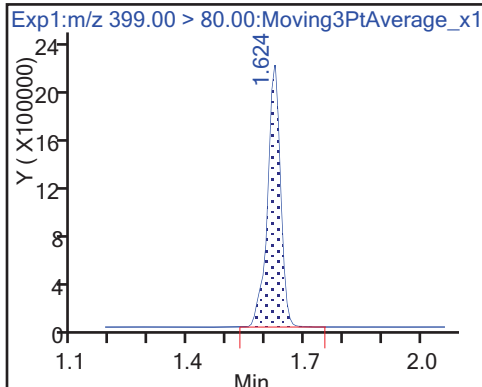
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

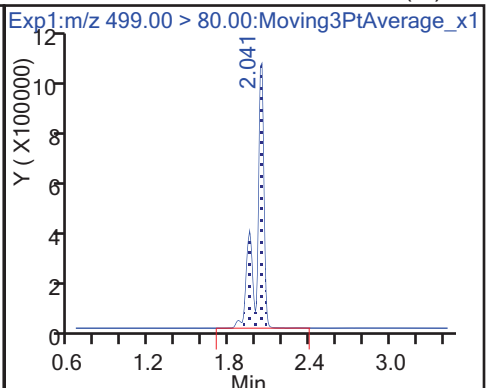
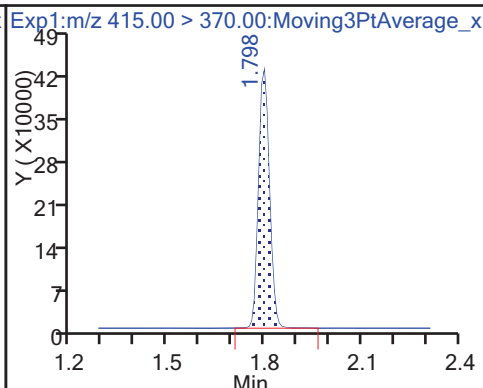
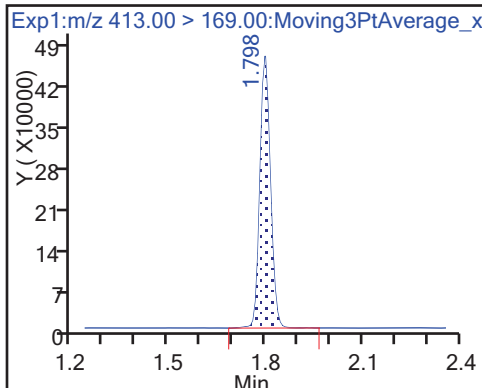
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

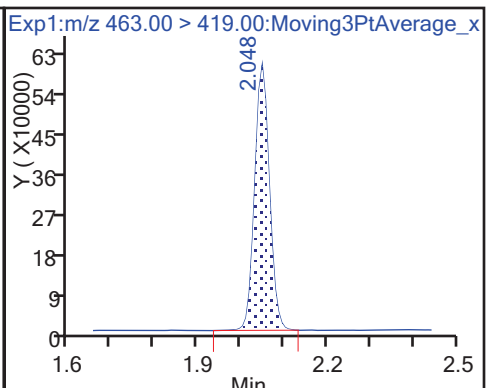
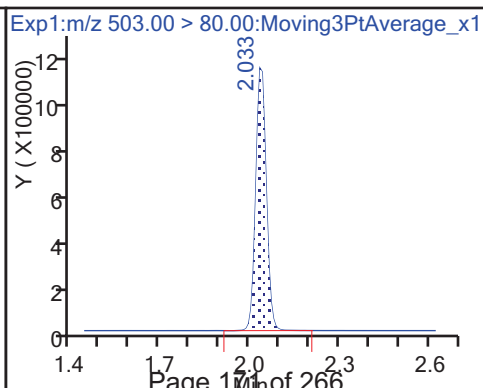
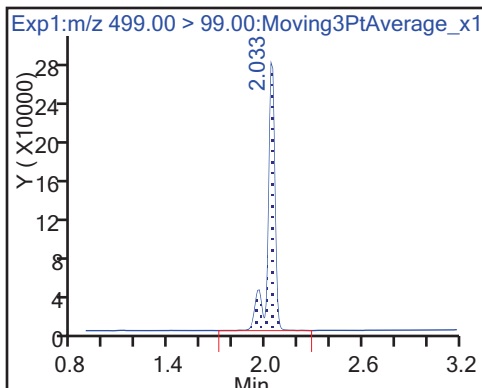
8 Perfluorooctane sulfonic acid (M)



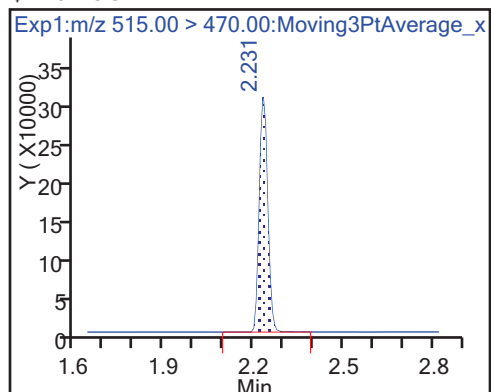
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

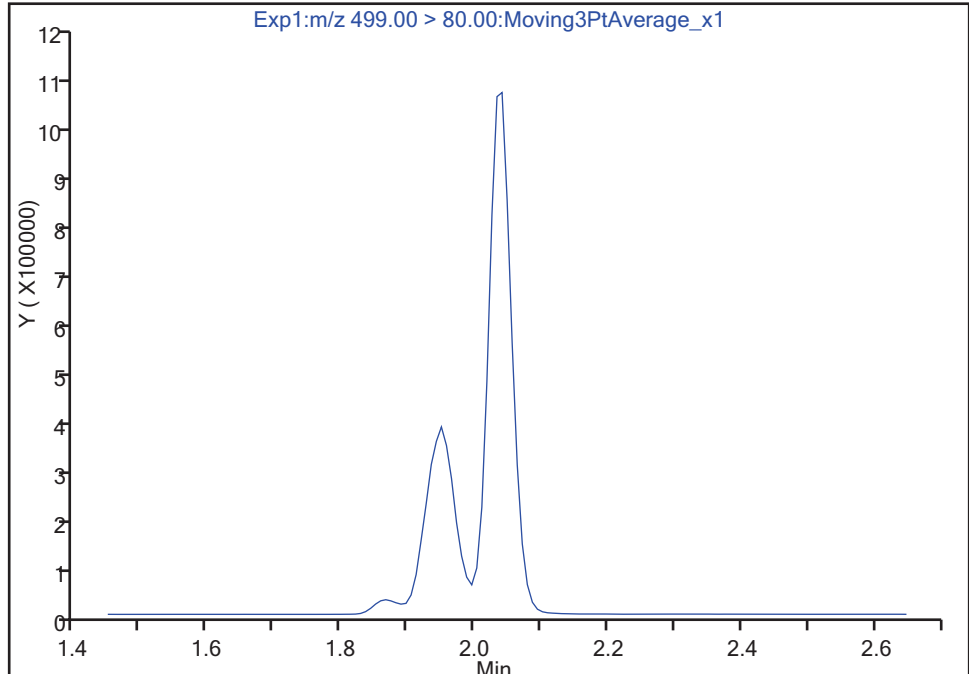
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_007.d
Injection Date: 15-Mar-2018 11:44:04 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

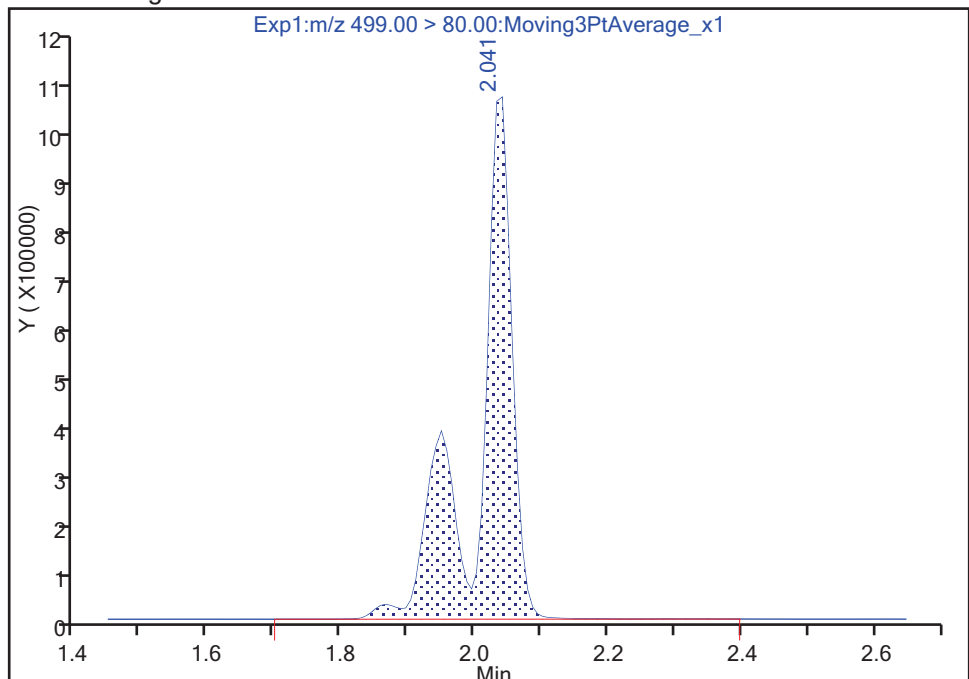
Not Detected
Expected RT: 2.02

Processing Integration Results



Manual Integration Results

RT: 2.04
Area: 3773967
Amount: 40.745758
Amount Units: ng/ml



Reviewer: barnettj, 15-Mar-2018 13:24:56
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_008.d
 Lims ID: IC L5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 15-Mar-2018 11:48:46 ALS Bottle#: 5 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L5_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 15-Mar-2018 14:06:03 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: barnettj

Date: 15-Mar-2018 13:27:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.376	-0.003	1.000	12839615	133.4		16715	
298.90 > 99.00	1.373	1.376	-0.003	1.000	9974000		1.29(0.00-0.00)	17538	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.487	1.491	-0.004	1.000	1132420	9.81		13939	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.616	1.624	-0.008	1.000	7702560	45.5		16816	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.626	-0.002	1.000	1639248	15.4		379	
* 6 13C2-PFOA									
415.00 > 370.00	1.791	1.794	-0.003		1057188	10.0		10032	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.791	1.794	-0.003	1.000	3029687	30.5		122	
413.00 > 169.00	1.791	1.794	-0.003	1.000	1629952		1.86(0.00-0.00)	2426	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.018	2.018	0.0	1.000	6222846	61.5		6894	a
499.00 > 99.00	2.018	2.018	0.0	1.000	1285525		4.84(0.00-0.00)	1036	a
* 7 13C4 PFOS									
503.00 > 80.00	2.018	2.018	0.0		3061123	28.7		7798	
9 Perfluorononanoic acid									
463.00 > 419.00	2.033	2.031	0.002	1.000	2198770	29.3		277	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.223	0.0	1.000	662151	10.0		2356	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

LC537-L5_00025

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_008.d

Injection Date: 15-Mar-2018 11:48:46

Instrument ID: A8_N

Lims ID: IC L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

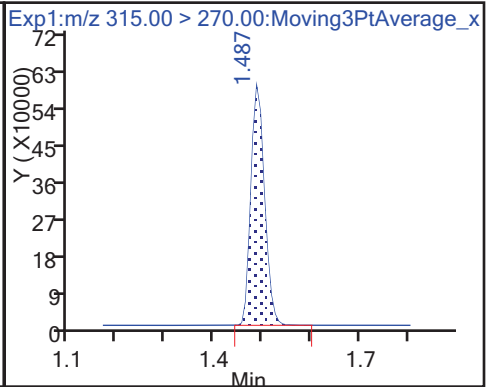
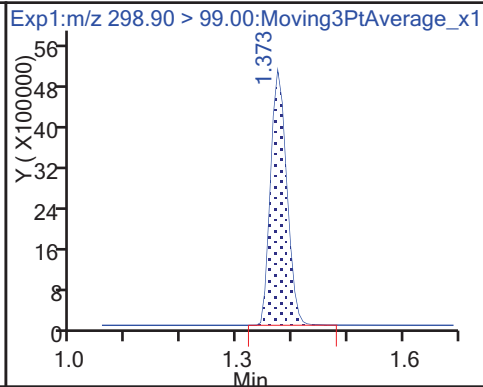
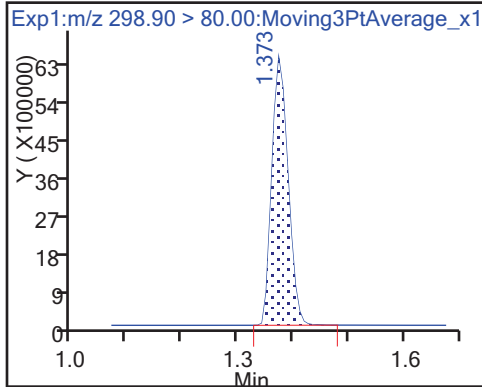
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

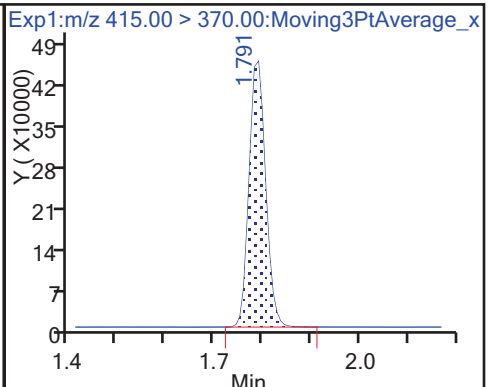
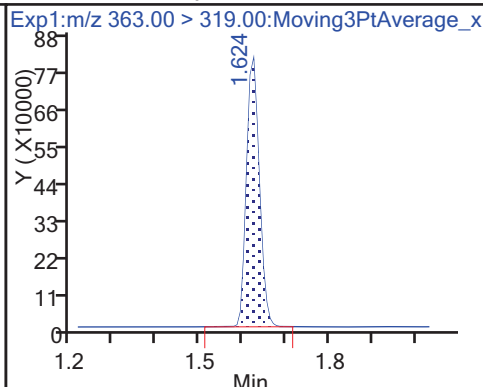
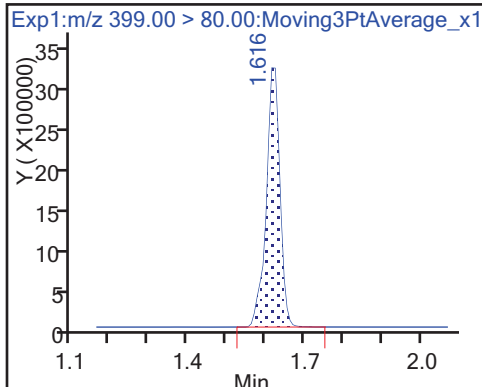
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

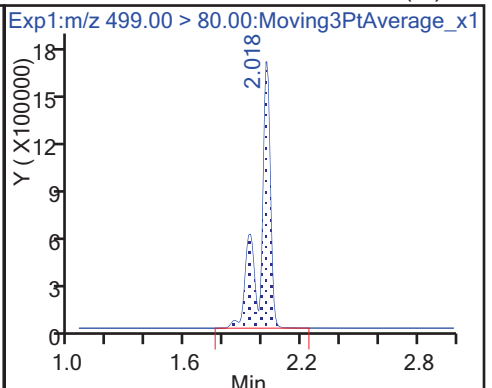
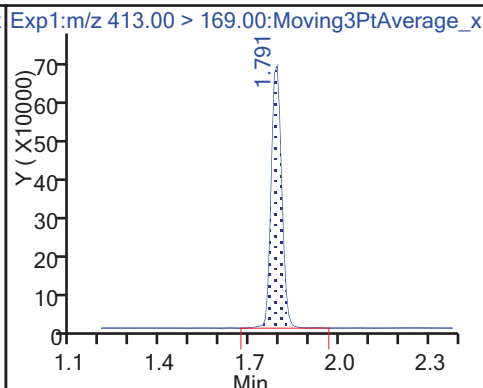
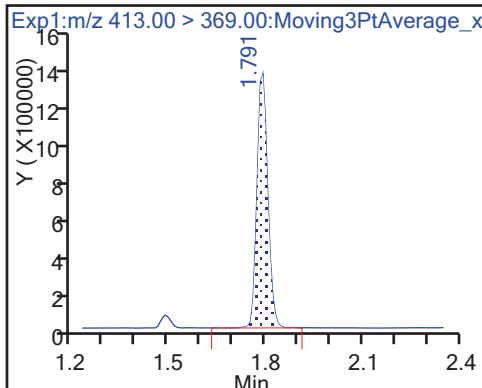
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

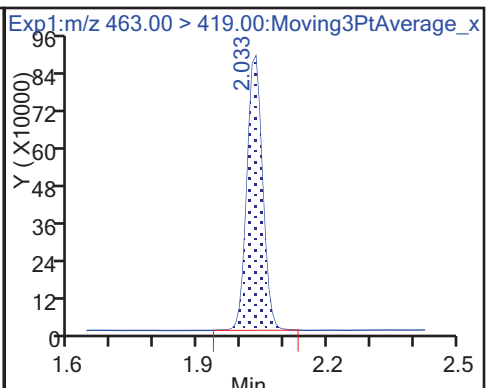
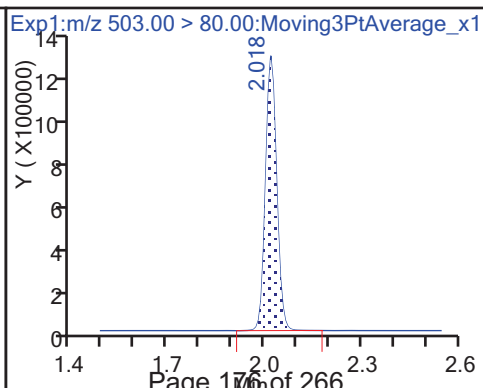
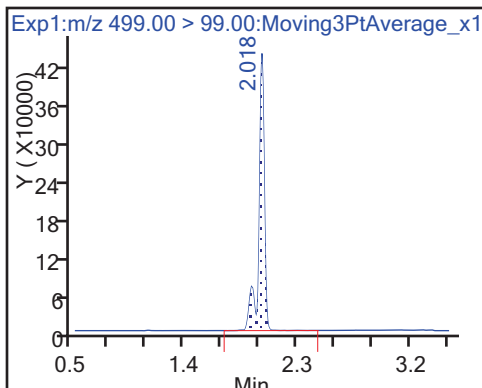
8 Perfluorooctane sulfonic acid (M)



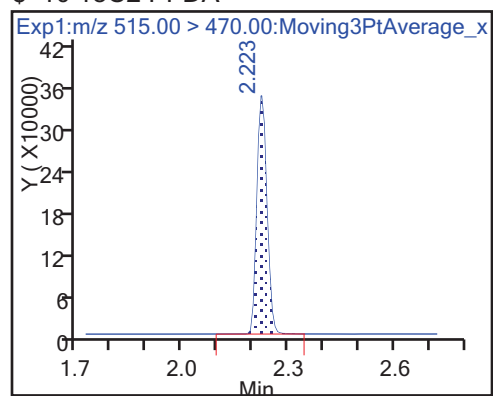
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

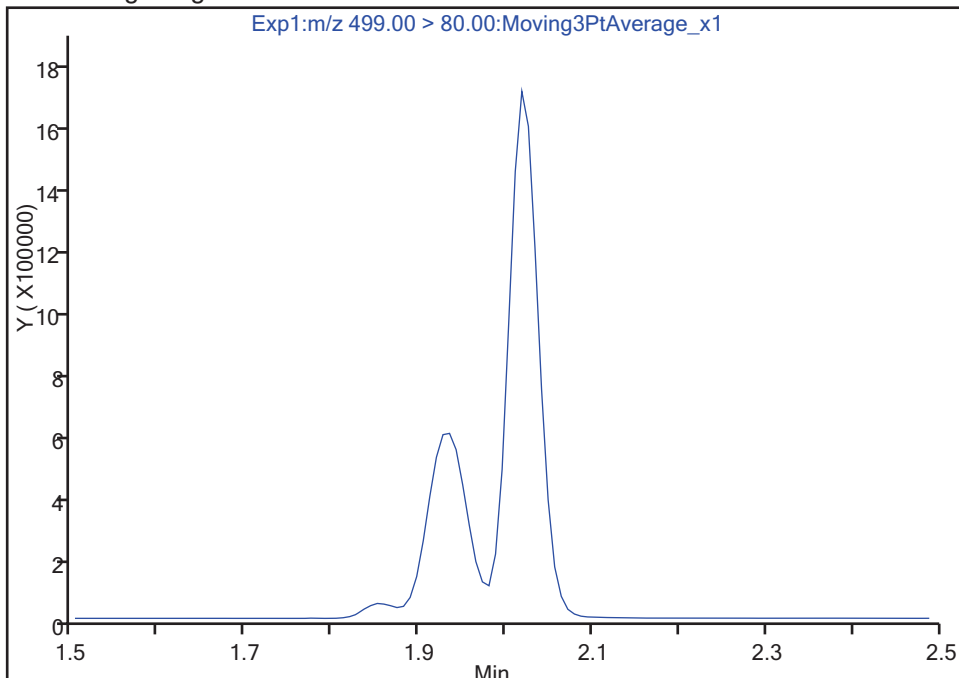
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_008.d
Injection Date: 15-Mar-2018 11:48:46 Instrument ID: A8_N
Lims ID: IC L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

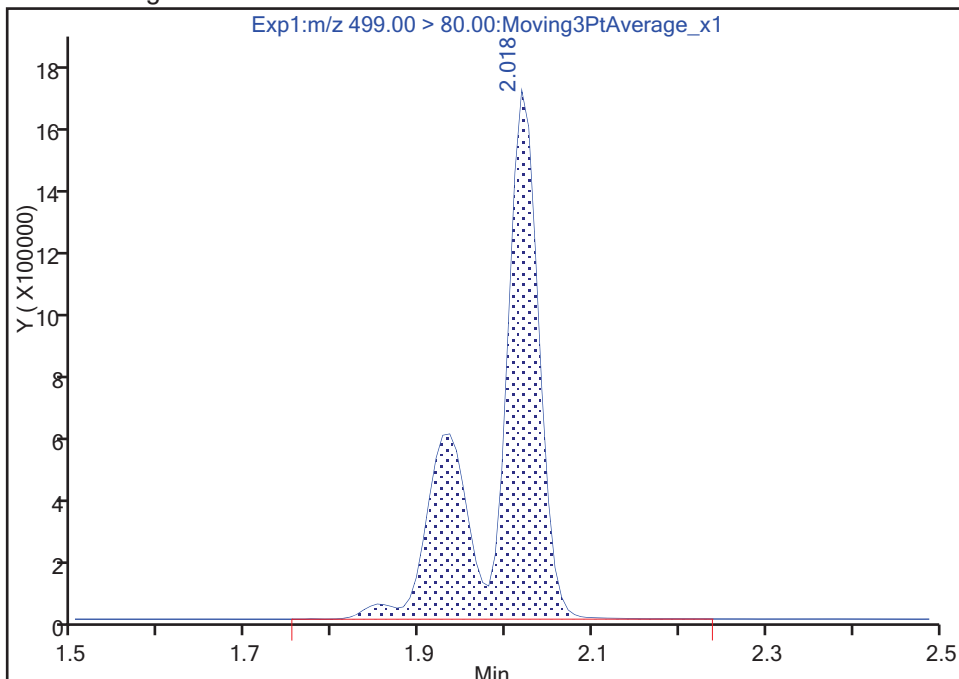
Not Detected
Expected RT: 2.02

Processing Integration Results



RT: 2.02
Area: 6222846
Amount: 61.539902
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 15-Mar-2018 13:25:25
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d
 Lims ID: IC L6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 15-Mar-2018 11:53:25 ALS Bottle#: 6 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L6_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 15-Mar-2018 14:06:04 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: barnettj

Date: 15-Mar-2018 13:25:19

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.376	0.005	1.000	13981920	180.7		17024	
298.90 > 99.00	1.381	1.376	0.005	1.000	11076586		1.26(0.00-0.00)	16607	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.491	0.004	1.000	988034	9.97		13428	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.631	1.624	0.007	1.000	8490426	57.1		18713	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.631	1.626	0.005	1.000	1724199	18.9		347	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.798	1.794	0.004	1.000	3297362	38.6		169	
413.00 > 169.00	1.798	1.794	0.004	1.000	1888557		1.75(0.00-0.00)	2791	
* 6 13C2-PFOA									
415.00 > 370.00	1.798	1.794	0.004		908006	10.0		9447	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.011	2.018	-0.007	1.000	7029722	79.1		7989	a
499.00 > 99.00	2.011	2.018	-0.007	1.000	1485015		4.73(0.00-0.00)	1295	a
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.018	-0.007		2691309	28.7		6895	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.031	-0.013	1.000	2482937	38.5		322	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.223	-0.008	1.000	599445	10.5		1922	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

LC537-L6_00021

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Injection Date: 15-Mar-2018 11:53:25

Instrument ID: A8_N

Lims ID: IC L6

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 6

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

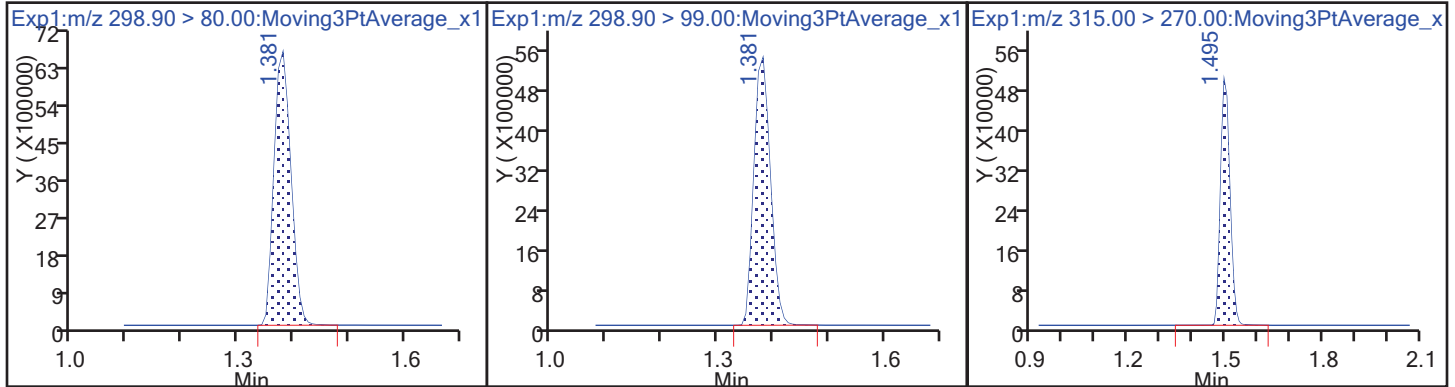
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

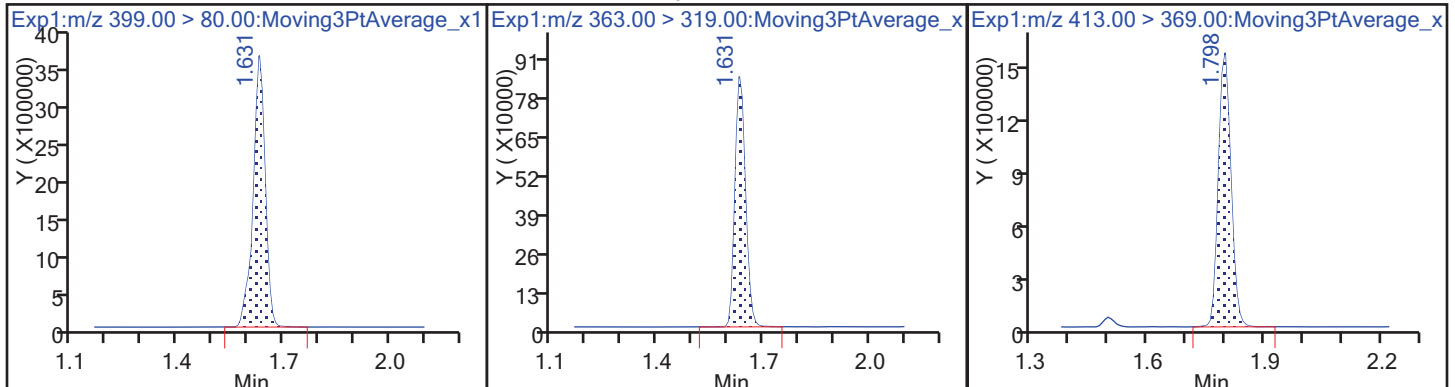
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

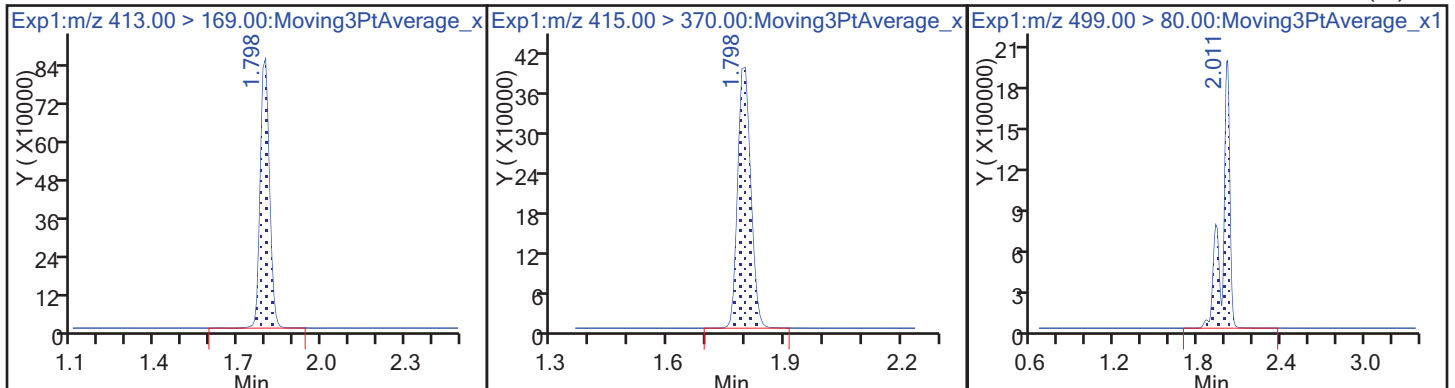
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

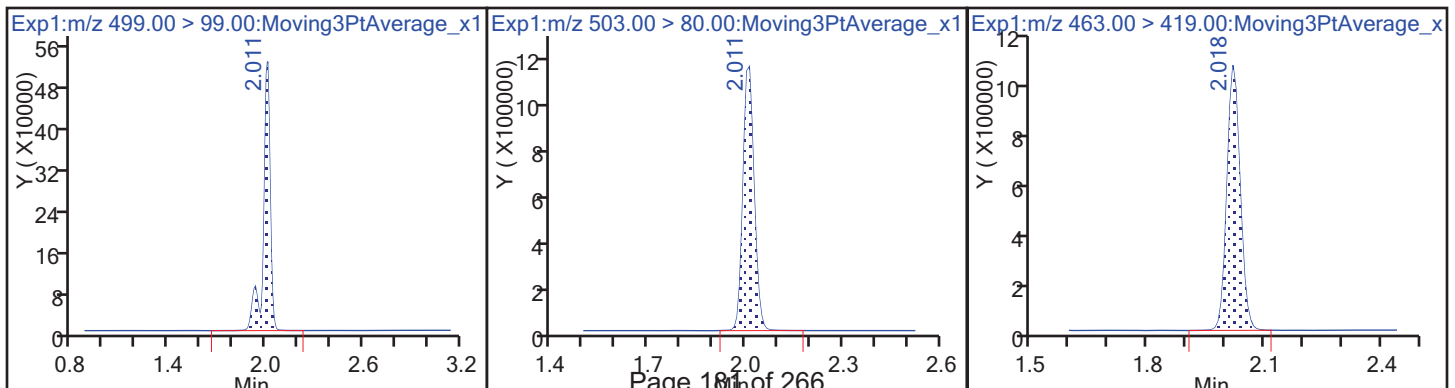
8 Perfluorooctane sulfonic acid (M)



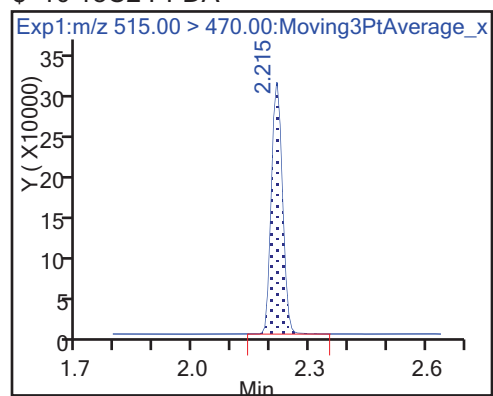
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

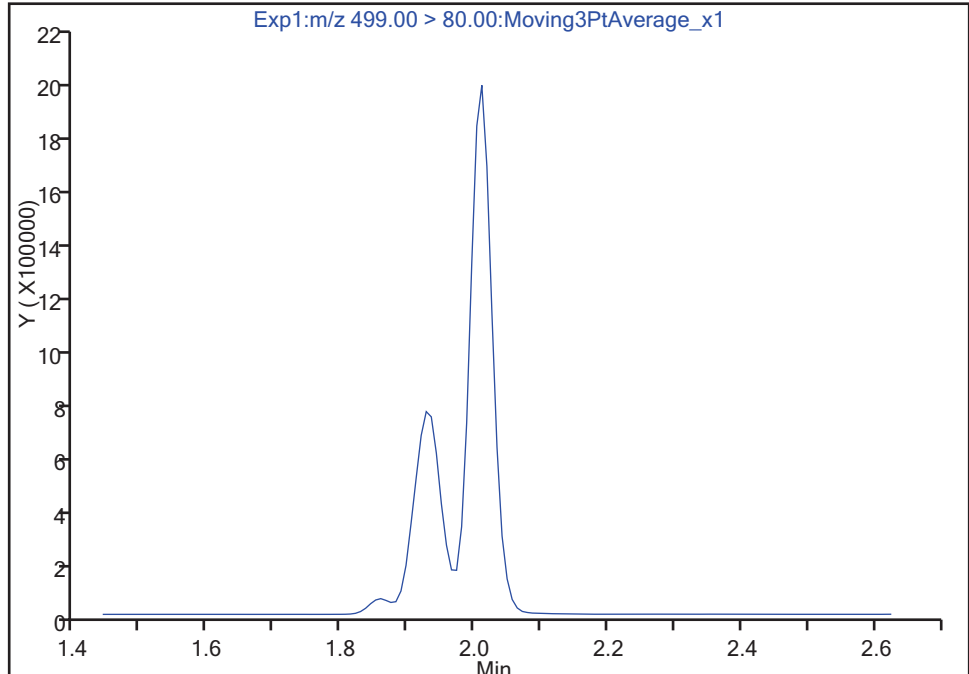
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d
Injection Date: 15-Mar-2018 11:53:25 Instrument ID: A8_N
Lims ID: IC L6
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

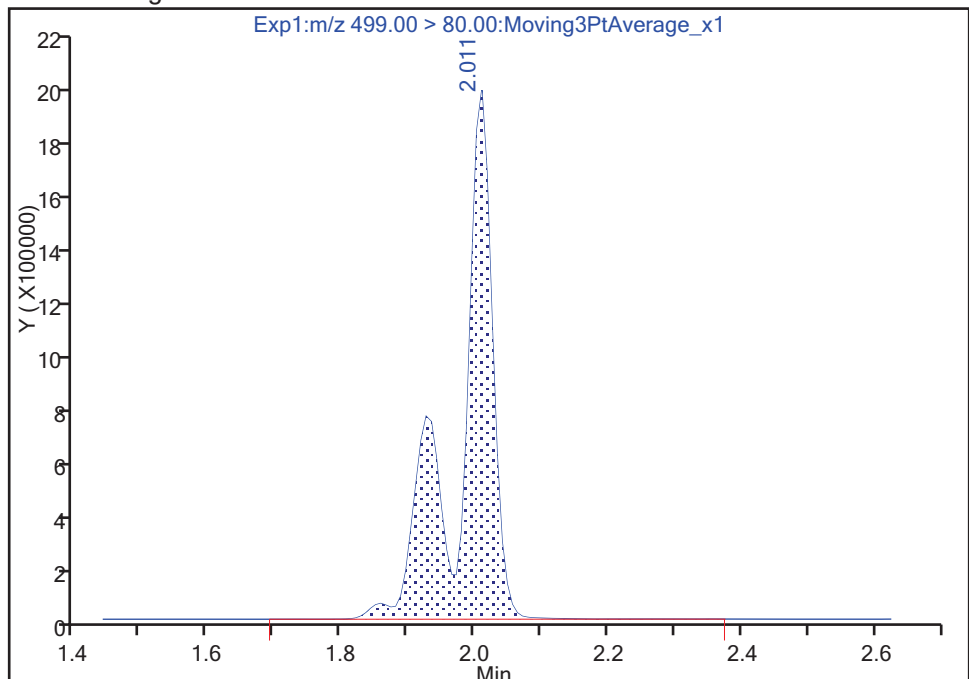
Not Detected
Expected RT: 2.02

Processing Integration Results



Manual Integration Results

RT: 2.01
Area: 7029722
Amount: 79.072071
Amount Units: ng/ml



Reviewer: barnettj, 15-Mar-2018 13:25:07

Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-213143/11 Calibration Date: 03/15/2018 12:02
 Instrument ID: A8_N Calib Start Date: 03/15/2018 11:30
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/15/2018 11:53
 Lab File ID: 2018.03.15_537ICAL_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		1.033		19.0	20.0	-5.0	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.586	1.566		6.58	6.67	-1.3	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.007	1.057		2.33	2.22	4.9	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9402	0.9814		4.67	4.47	4.4	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9474	0.9554		9.00	8.93	0.8	50.0
Perfluorononanoic acid (PFNA)	Ave	0.7100	0.7134		4.47	4.45	0.5	50.0
13C2 PFHxA	Ave	1.092	1.079		9.88	10.0	-1.2	30.0
13C2 PFDA	Ave	0.6269	0.5876		9.37	10.0	-6.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_011.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 15-Mar-2018 12:02:46 ALS Bottle#: 2 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L2
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 15-Mar-2018 13:54:09 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: barnettj

Date: 15-Mar-2018 13:24:00

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.376	-0.003	1.000	1846384	19.0		3721	
298.90 > 99.00	1.373	1.376	-0.003	1.000	1374748		1.34(0.00-0.00)	3007	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.487	1.491	-0.004	1.000	968686	9.88		14201	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.616	1.624	-0.008	1.000	932687	6.58		2874	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.626	-0.002	1.000	210897	2.33		44.4	
* 6 13C2-PFOA									
415.00 > 370.00	1.791	1.794	-0.003		897894	10.0		11337	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.791	1.794	-0.003	1.000	393817	4.67		19.1	
413.00 > 169.00	1.791	1.794	-0.003	1.000	204909		1.92(0.00-0.00)	322	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.018	2.018	0.0	1.000	761820	9.00		1057	a
499.00 > 99.00	2.018	2.018	0.0	1.000	168246		4.53(0.00-0.00)	161	a
* 7 13C4 PFOS									
503.00 > 80.00	2.018	2.018	0.0		2561754	28.7		6968	
9 Perfluorononanoic acid									
463.00 > 419.00	2.033	2.031	0.002	1.000	284783	4.47		36.9	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.223	0.0	1.000	527623	9.37		1765	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

LC537-L2_00021

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_011.d

Injection Date: 15-Mar-2018 12:02:46

Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

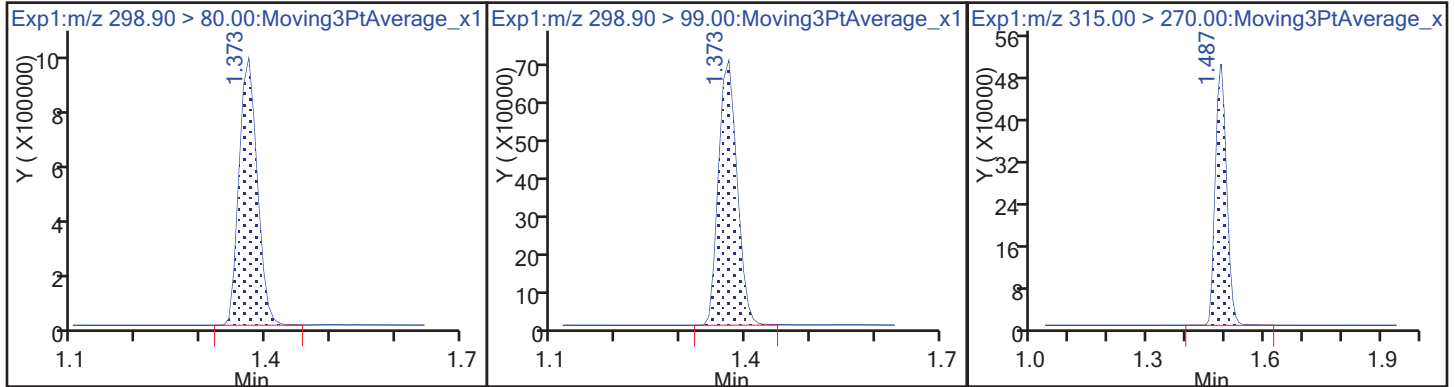
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

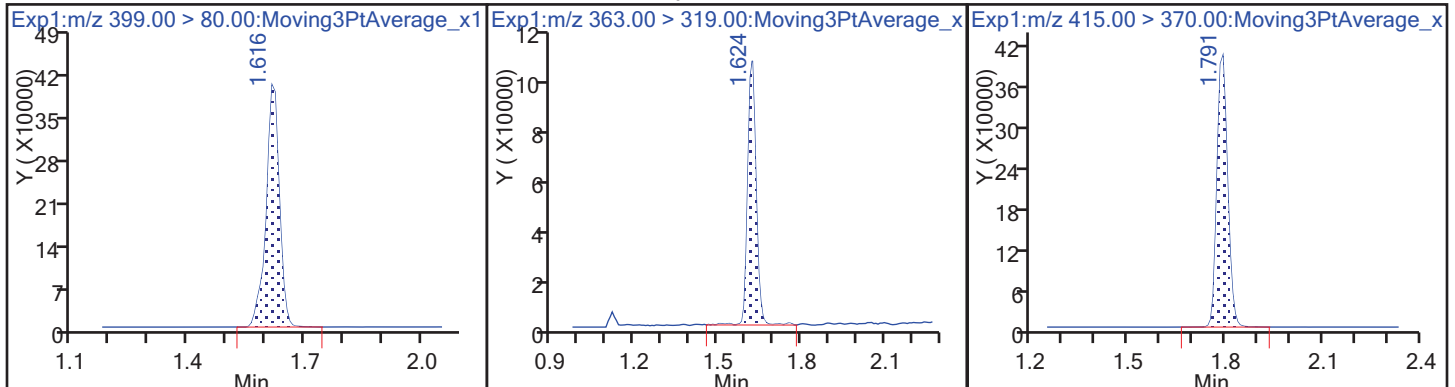
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

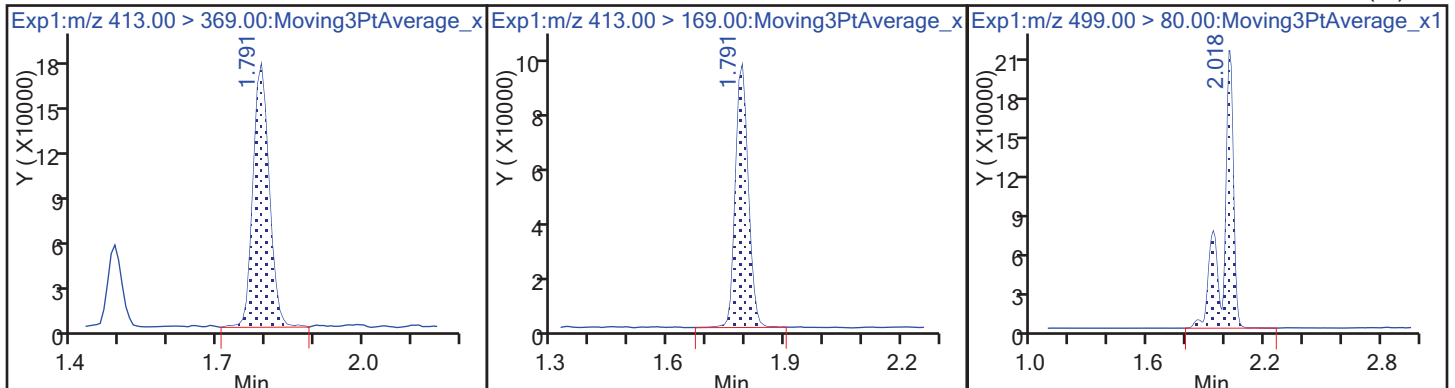
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

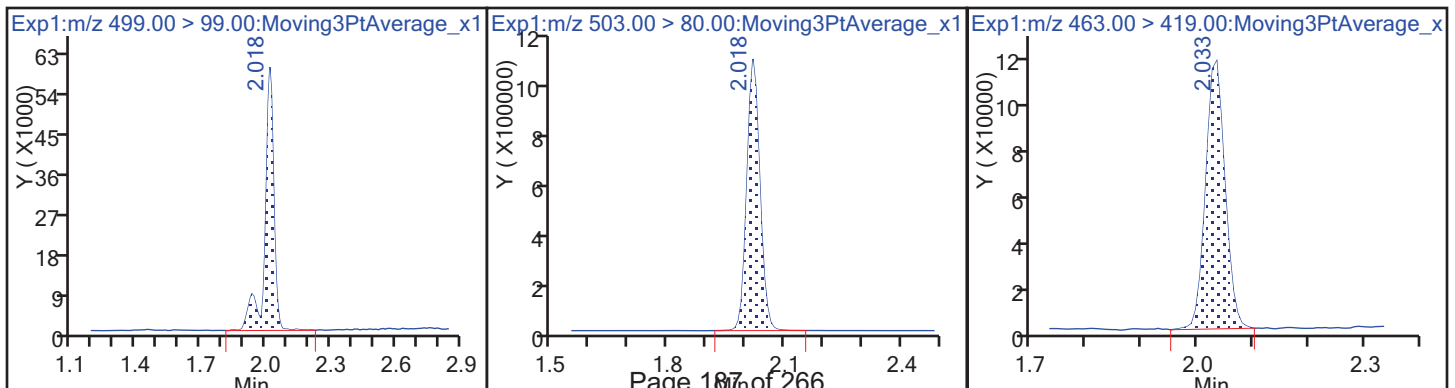
8 Perfluorooctane sulfonic acid (M)



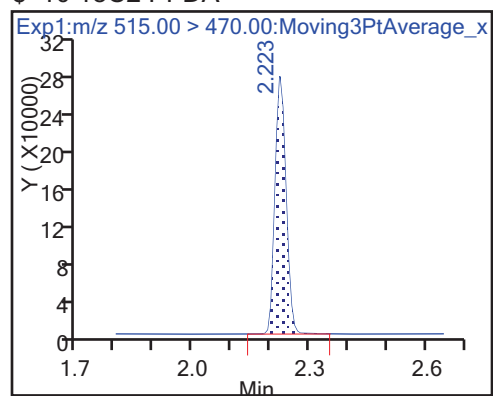
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

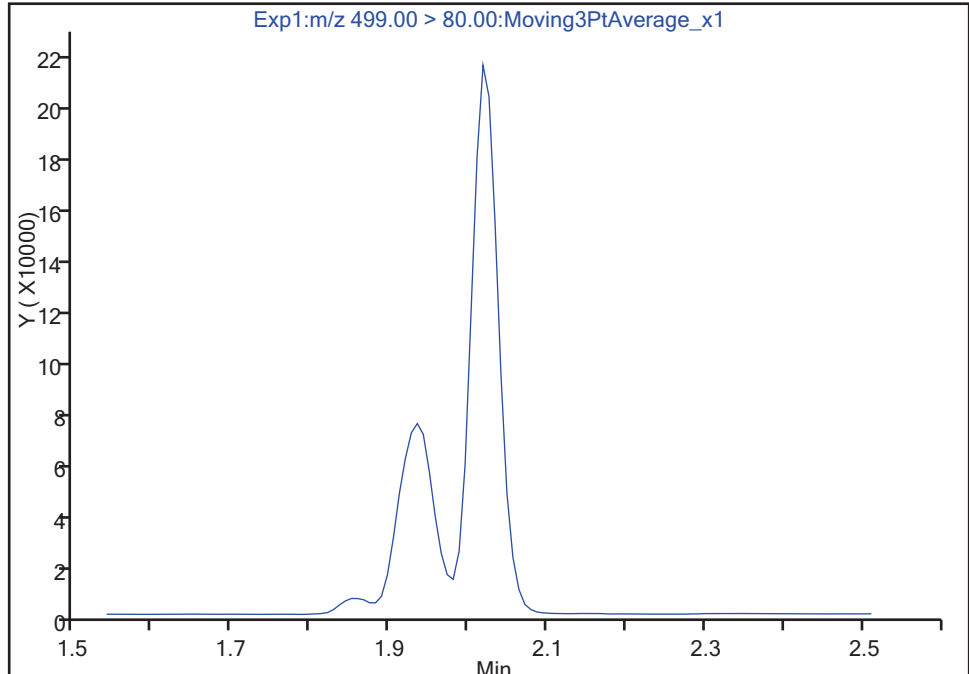
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_011.d
Injection Date: 15-Mar-2018 12:02:46 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

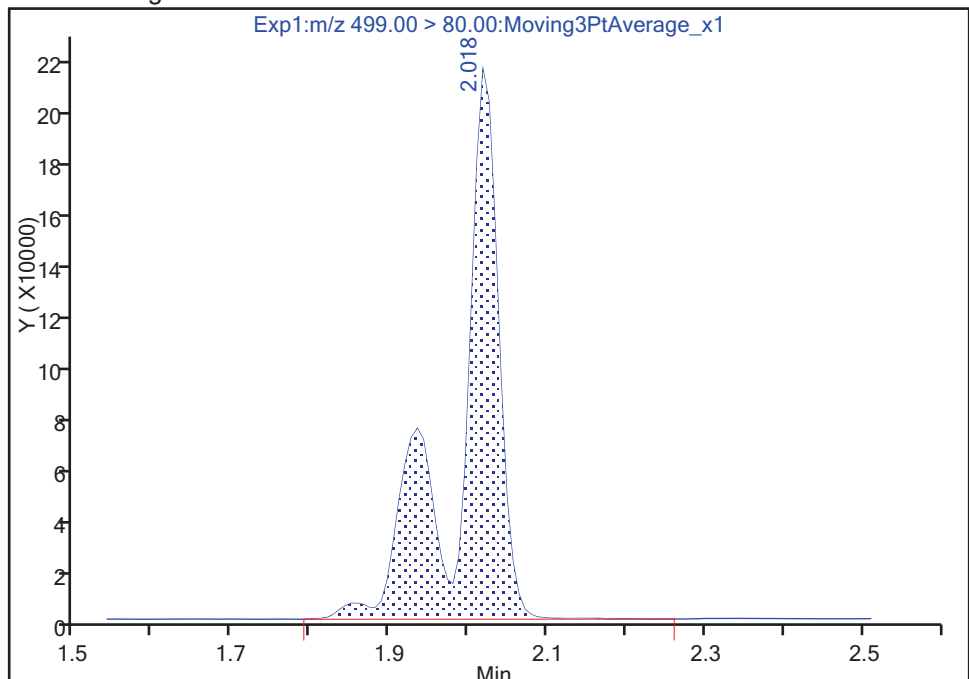
Not Detected
Expected RT: 2.02

Processing Integration Results



RT: 2.02
Area: 761820
Amount: 9.002507
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 15-Mar-2018 13:23:48
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Lab Sample ID: ICV 320-213143/13 Calibration Date: 03/15/2018 14:35
 Instrument ID: A8_N Calib Start Date: 03/15/2018 11:30
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/15/2018 11:53
 Lab File ID: 2018.03.15_537ICALA_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		0.9771		103	100	2.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.007	0.997		9.90	10.0	-1.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.586	1.618		20.6	20.2	2.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9402	0.8934		19.2	20.2	-5.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9474	0.9723		20.7	20.2	2.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7100	0.7487		21.3	20.2	5.4	30.0
13C2 PFHxA	Ave	1.092	1.087		9.96	10.0	-0.4	30.0
13C2 PFDA	Ave	0.6269	0.6217		9.92	10.0	-0.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICALA_013.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 15-Mar-2018 14:35:42 ALS Bottle#: 7 Worklist Smp#: 13
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist:
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 15-Mar-2018 14:56:46 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: barnettj Date: 15-Mar-2018 14:51:12

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.376	0.005	1.000	8762145	102.8		13971	
298.90 > 99.00	1.381	1.376	0.005	1.000	6812116		1.29(0.00-0.00)	12486	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.491	0.004	1.000	962372	9.96		15183	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.631	1.624	0.007	1.000	2922352	20.6		7921	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.631	1.626	0.005	1.000	882421	9.90		210	
* 6 13C2-PFOA									
415.00 > 370.00	1.806	1.794	0.012		885172	10.0		9522	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.806	1.794	0.012	1.000	1594855	19.2		63.1	
413.00 > 169.00	1.806	1.794	0.012	1.000	856934		1.86(0.00-0.00)	1319	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.048	2.018	0.030	1.000	1757045	20.7		2427	a
499.00 > 99.00	2.048	2.018	0.030	1.000	343755		5.11(0.00-0.00)	315	a
* 7 13C4 PFOS									
503.00 > 80.00	2.048	2.018	0.030		2569550	28.7		7336	
9 Perfluorononanoic acid									
463.00 > 419.00	2.056	2.031	0.025	1.000	1336285	21.3		201	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.238	2.223	0.015	1.000	550312	9.92		2201	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

LC537-ICV_00030

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICALA_013.d

Injection Date: 15-Mar-2018 14:35:42

Instrument ID: A8_N

Lims ID: ICV

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 7

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

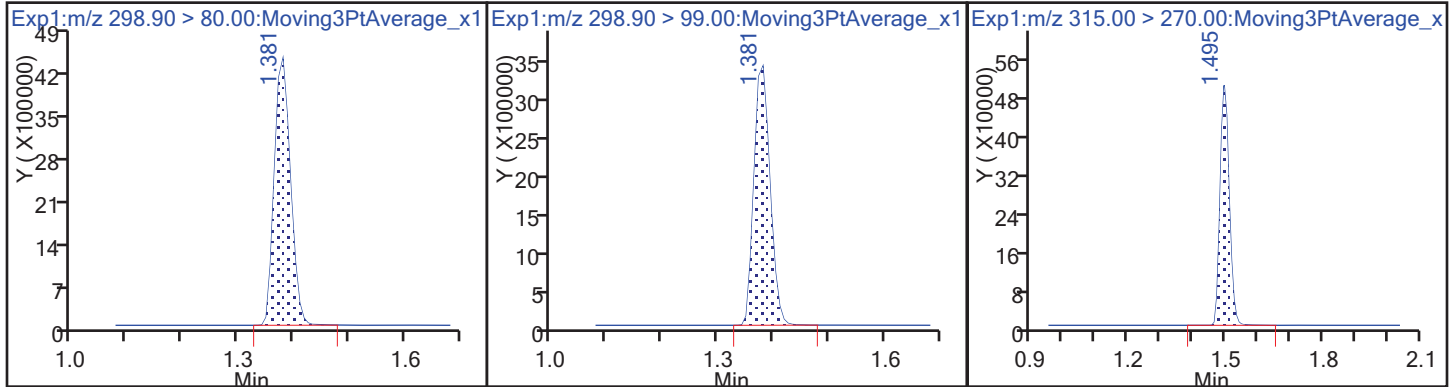
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

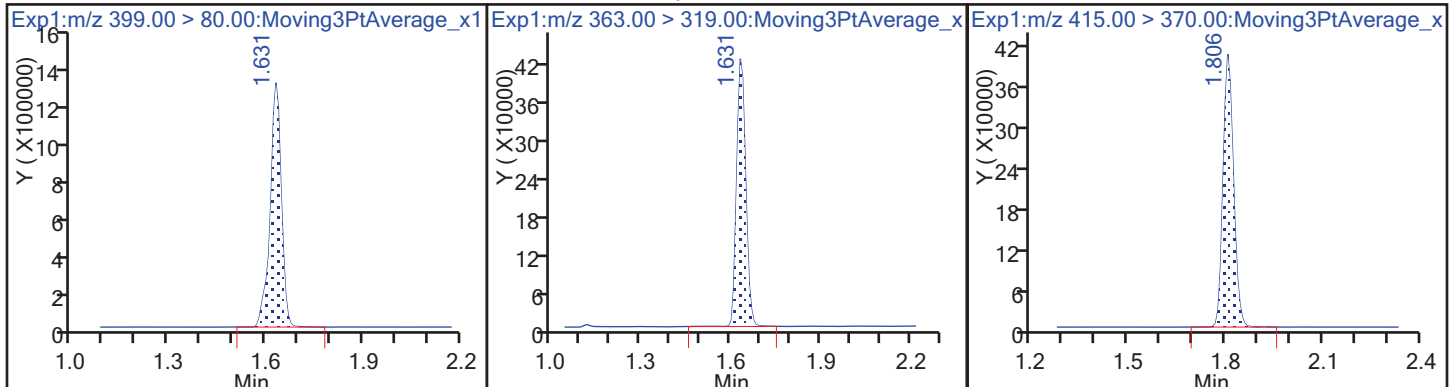
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

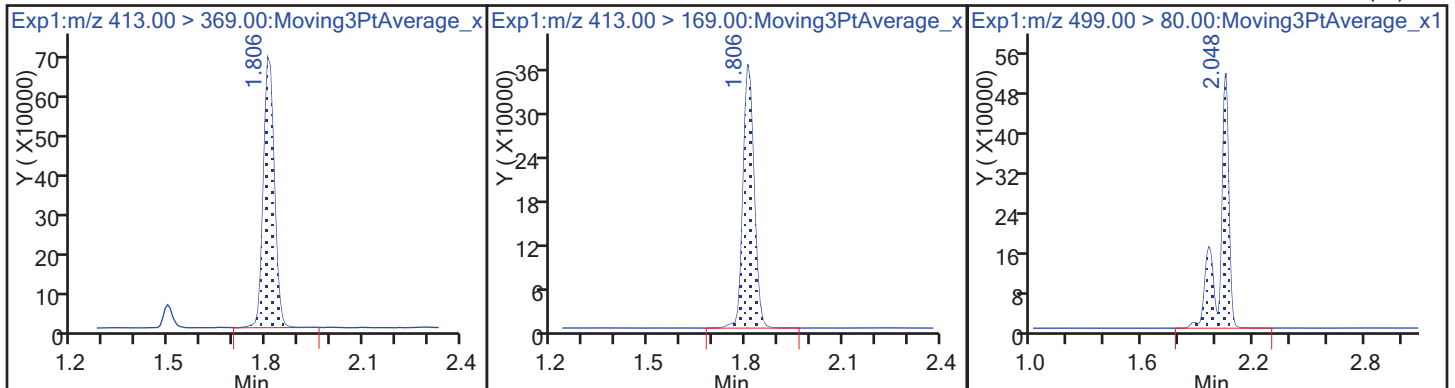
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

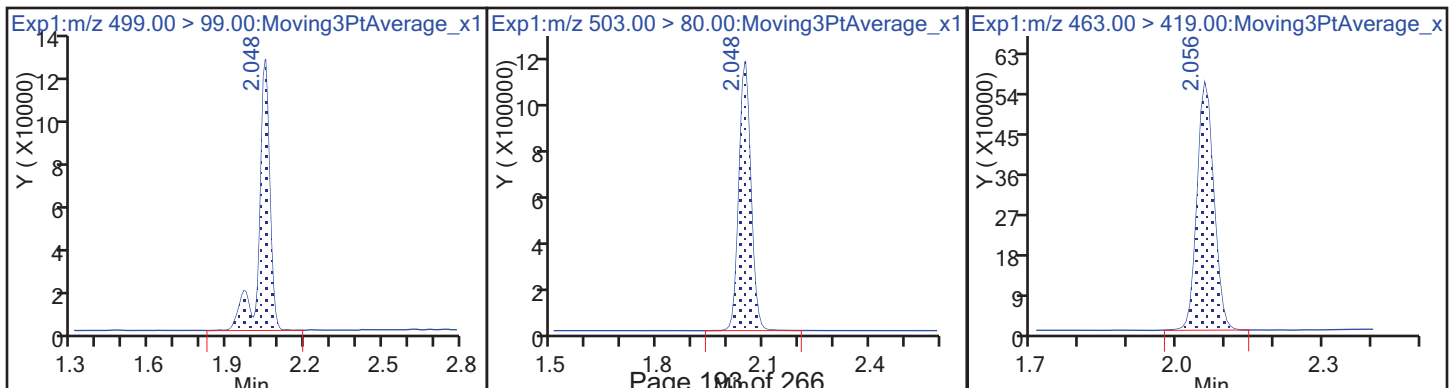
8 Perfluorooctane sulfonic acid (M)



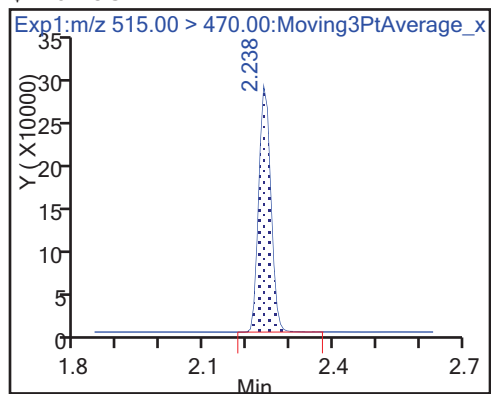
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

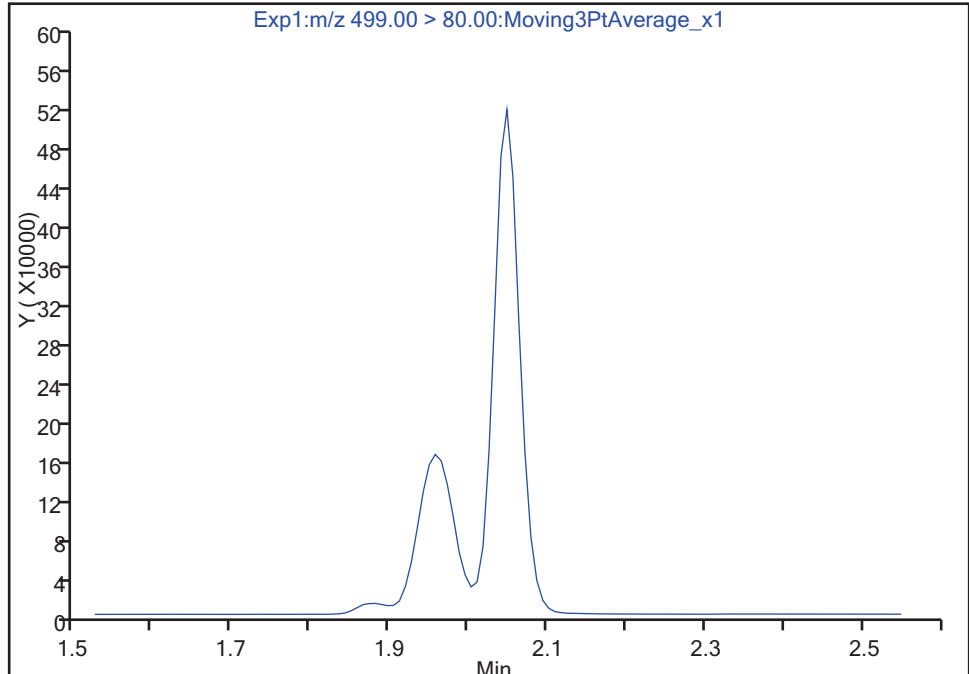
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICALA_013.d
Injection Date: 15-Mar-2018 14:35:42 Instrument ID: A8_N
Lims ID: ICV
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 7 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

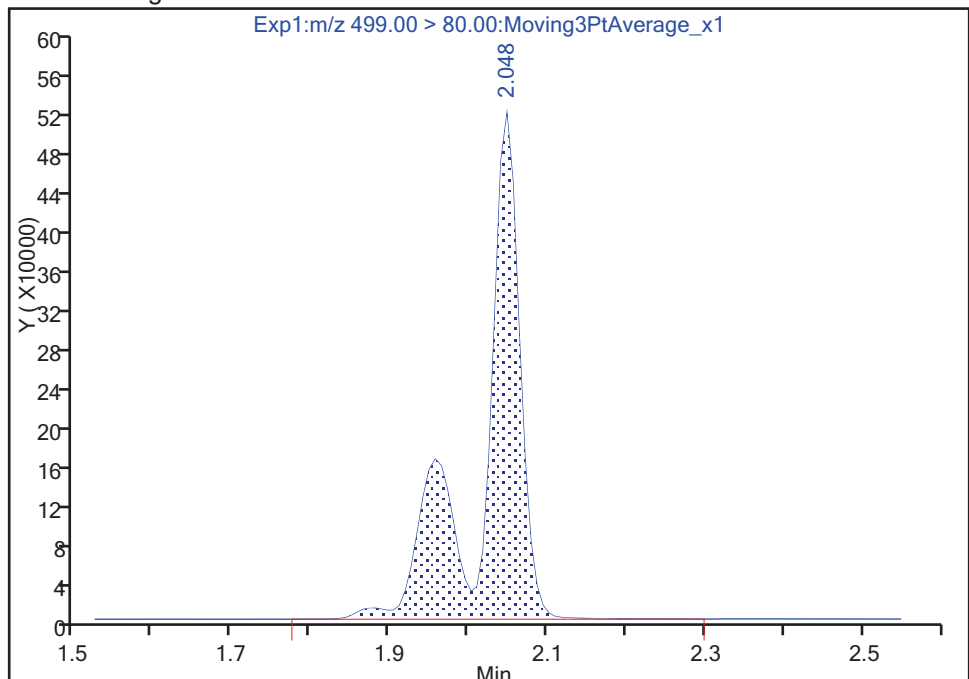
Not Detected
Expected RT: 2.02

Processing Integration Results



RT: 2.05
Area: 1757045
Amount: 20.700190
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 15-Mar-2018 14:49:43
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Lab Sample ID: CCV 320-213297/12 Calibration Date: 03/15/2018 22:24
 Instrument ID: A8_N Calib Start Date: 03/15/2018 11:30
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/15/2018 11:53
 Lab File ID: 2018.03.15_537AAX_016.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.8977		135	135	-0.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.586	1.538		43.6	45.0	-3.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.007	0.9604		14.3	15.0	-4.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9402	0.9890		31.7	30.2	5.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9474	0.9455		60.1	60.3	-0.2	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7100	0.6924		29.3	30.0	-2.5	30.0
13C2 PFHxA	Ave	1.092	1.061		9.72	10.0	-2.8	30.0
13C2 PFDA	Ave	0.6269	0.6400		10.2	10.0	2.1	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_016.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 15-Mar-2018 22:24:43 ALS Bottle#: 5 Worklist Smp#: 12
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK015

First Level Reviewer: roycea

Date: 16-Mar-2018 07:49:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.373	0.0	1.000	11707870	134.8		15692	
298.90 > 99.00	1.373	1.373	0.0	1.000	9003777		1.30(0.00-0.00)	15109	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.495	0.0	1.000	996638	9.72		13775	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.624	0.0	1.000	6686313	43.6		12911	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.631	1.631	0.0	1.000	1353575	14.3		245	
* 6 13C2-PFOA									
415.00 > 370.00	1.798	1.798	0.0		939380	10.0		9617	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.798	1.798	0.0	1.000	2802583	31.7		104	
413.00 > 169.00	1.798	1.798	0.0	1.000	1512892		1.85(0.00-0.00)	2251	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.026	2.026	0.0	1.000	5503598	60.1		6059	a
499.00 > 99.00	2.026	2.026	0.0	1.000	1130804		4.87(0.00-0.00)	938	a
* 7 13C4 PFOS									
503.00 > 80.00	2.026	2.026	0.0		2770557	28.7		7096	
9 Perfluorononanoic acid									
463.00 > 419.00	2.033	2.033	0.0	1.000	1951831	29.3		237	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.231	2.231	0.0	1.000	601152	10.2		2140	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

LC537-L5_00025

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_016.d

Injection Date: 15-Mar-2018 22:24:43

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 12

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

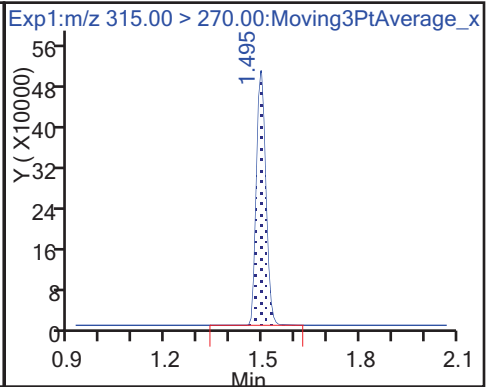
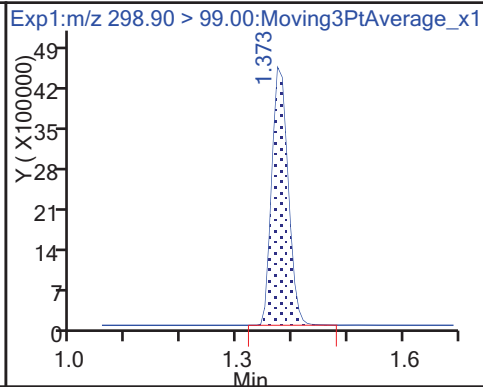
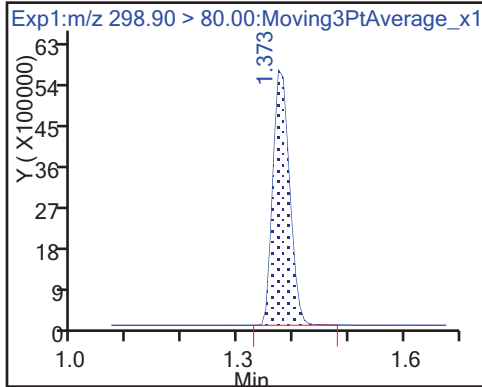
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

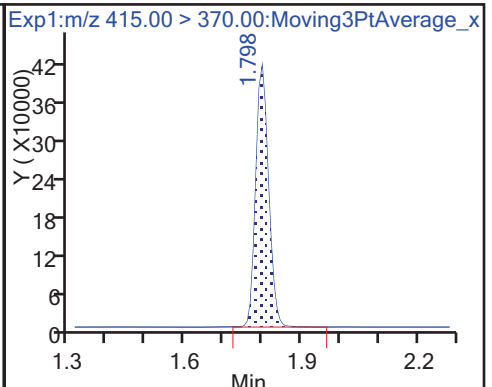
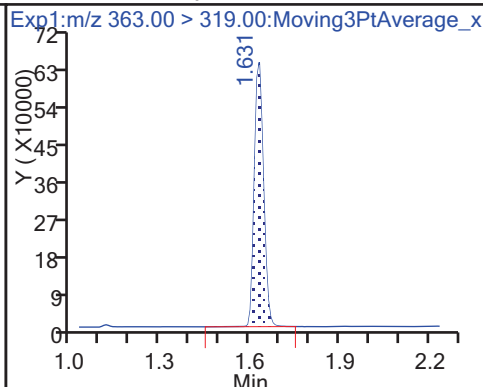
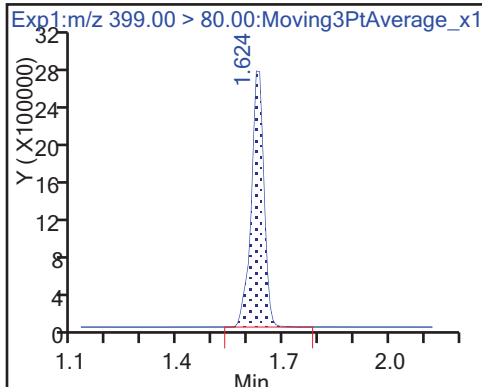
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

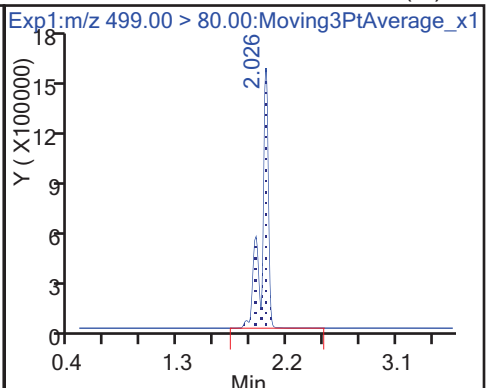
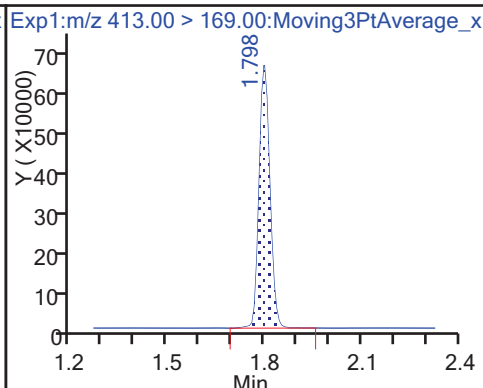
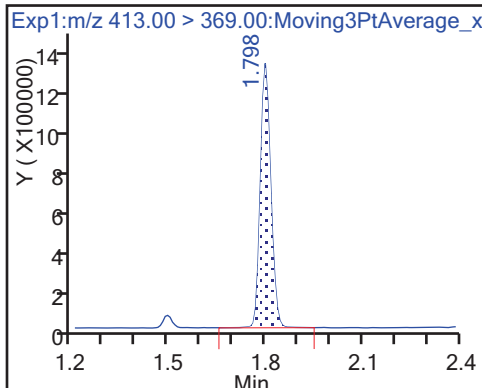
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

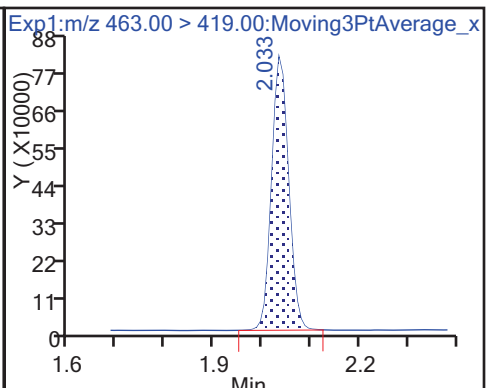
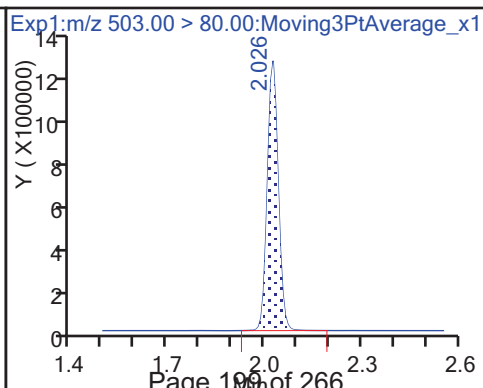
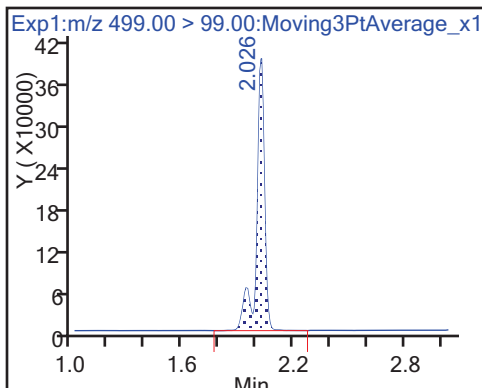
8 Perfluorooctane sulfonic acid (M)



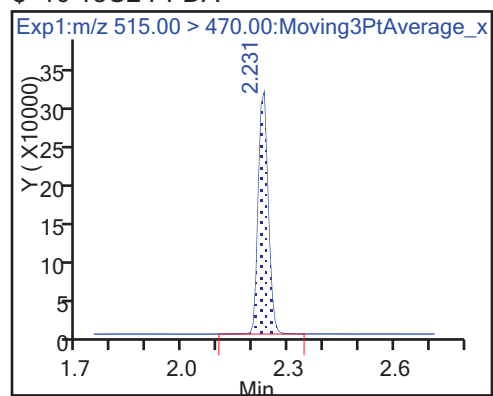
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_016.d

Injection Date: 15-Mar-2018 22:24:43

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#:

5

Worklist Smp#: 12

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537_A8_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

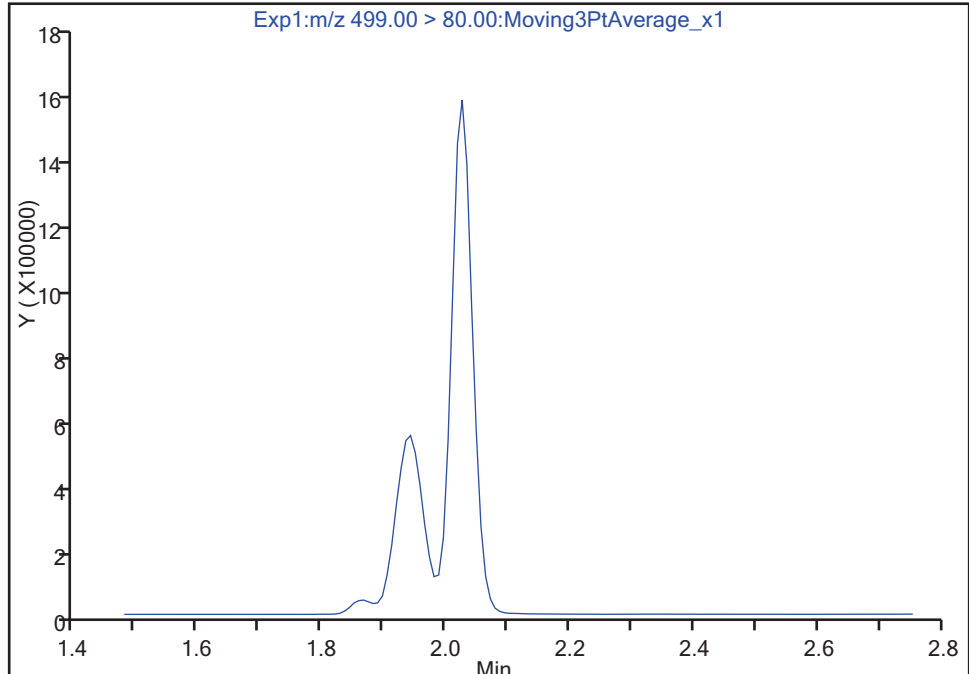
8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

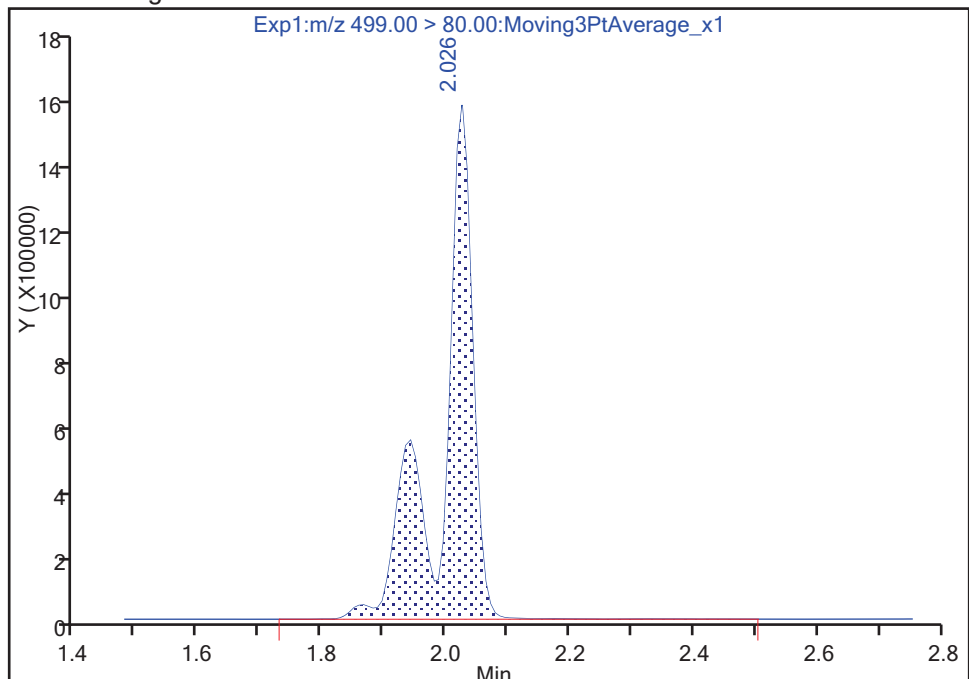
Not Detected

Expected RT: 2.03

Processing Integration Results



Manual Integration Results



RT: 2.03

Area: 5503598

Amount: 60.135114

Amount Units: ng/ml

Reviewer: roycea, 16-Mar-2018 07:48:56

Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Lab Sample ID: CCV 320-213297/22 Calibration Date: 03/15/2018 23:11
 Instrument ID: A8_N Calib Start Date: 03/15/2018 11:30
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/15/2018 11:53
 Lab File ID: 2018.03.15_537AAX_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		1.030		44.3	45.0	-1.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.007	1.016		5.04	5.00	0.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.586	1.550		14.7	15.0	-2.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9402	0.9844		10.5	10.1	4.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9474	0.9342		19.8	20.1	-1.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7100	0.7170		10.1	10.0	1.0	30.0
13C2 PFHxA	Ave	1.092	1.087		9.96	10.0	-0.4	30.0
13C2 PFDA	Ave	0.6269	0.6572		10.5	10.0	4.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Lab Sample ID: CCV 320-213299/22 Calibration Date: 03/15/2018 23:11
 Instrument ID: A8_N Calib Start Date: 03/15/2018 11:30
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/15/2018 11:53
 Lab File ID: 2018.03.15_537AAX_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		1.030		44.3	45.0	-1.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.007	1.016		5.04	5.00	0.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.586	1.550		14.7	15.0	-2.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9402	0.9844		10.5	10.1	4.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9474	0.9342		19.8	20.1	-1.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7100	0.7170		10.1	10.0	1.0	30.0
13C2 PFHxA	Ave	1.092	1.087		9.96	10.0	-0.4	30.0
13C2 PFDA	Ave	0.6269	0.6572		10.5	10.0	4.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_026.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 15-Mar-2018 23:11:33 ALS Bottle#: 3 Worklist Smp#: 22
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L3
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Mar-2018 10:22:49 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK015

First Level Reviewer: barnettj

Date: 16-Mar-2018 10:14:08

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.373	0.0	1.000	4423426	44.3		7167	
298.90 > 99.00	1.373	1.373	0.0	1.000	3414128		1.30(0.00-0.00)	7530	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.487	1.487	0.0	1.000	1012702	9.96		13963	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.624	0.0	1.000	2219027	14.7		4951	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.624	0.0	1.000	473415	5.04		91.2	
* 6 13C2-PFOA									
415.00 > 370.00	1.791	1.791	0.0		931704	10.0		8499	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.791	1.791	0.0	1.000	922217	10.5		31.8	
413.00 > 169.00	1.791	1.791	0.0	1.000	484658		1.90(0.00-0.00)	804	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.026	2.026	0.0	1.000	1789984	19.8		2264	a
499.00 > 99.00	2.026	2.026	0.0	1.000	379163		4.72(0.00-0.00)	284	a
* 7 13C4 PFOS									
503.00 > 80.00	2.026	2.026	0.0		2735870	28.7		8516	
9 Perfluorononanoic acid									
463.00 > 419.00	2.033	2.033	0.0	1.000	668217	10.1		82.1	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.231	2.231	0.0	1.000	612344	10.5		2503	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

LC537-L3_00024

Amount Added: 1.00

Units: mL

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_026.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 15-Mar-2018 23:11:33 ALS Bottle#: 3 Worklist Smp#: 22
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L3
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Mar-2018 10:22:49 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK015

First Level Reviewer: barnettj

Date: 16-Mar-2018 10:14:08

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.373	0.0	1.000	4423426	44.3		7167	
298.90 > 99.00	1.373	1.373	0.0	1.000	3414128		1.30(0.00-0.00)	7530	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.487	1.487	0.0	1.000	1012702	9.96		13963	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.624	0.0	1.000	2219027	14.7		4951	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.624	0.0	1.000	473415	5.04		91.2	
* 6 13C2-PFOA									
415.00 > 370.00	1.791	1.791	0.0		931704	10.0		8499	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.791	1.791	0.0	1.000	922217	10.5		31.8	
413.00 > 169.00	1.791	1.791	0.0	1.000	484658		1.90(0.00-0.00)	804	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.026	2.026	0.0	1.000	1789984	19.8		2264	a
499.00 > 99.00	2.026	2.026	0.0	1.000	379163		4.72(0.00-0.00)	284	a
* 7 13C4 PFOS									
503.00 > 80.00	2.026	2.026	0.0		2735870	28.7		8516	
9 Perfluorononanoic acid									
463.00 > 419.00	2.033	2.033	0.0	1.000	668217	10.1		82.1	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.231	2.231	0.0	1.000	612344	10.5		2503	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

LC537-L3_00024

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_026.d

Injection Date: 15-Mar-2018 23:11:33

Instrument ID: A8_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 22

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

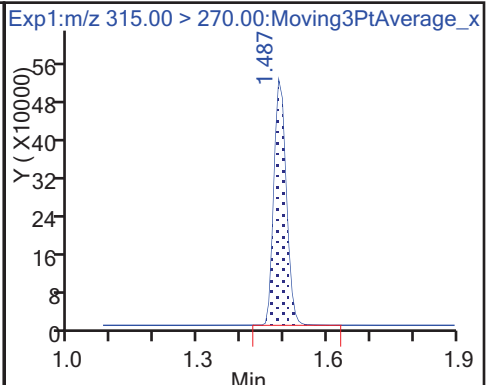
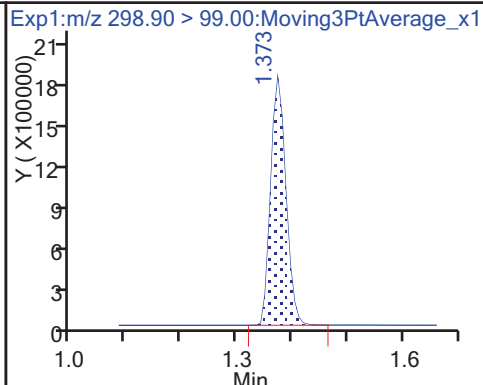
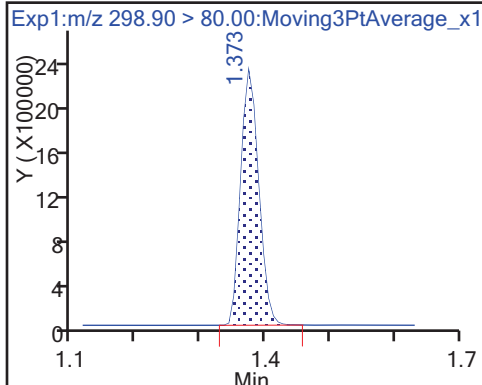
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

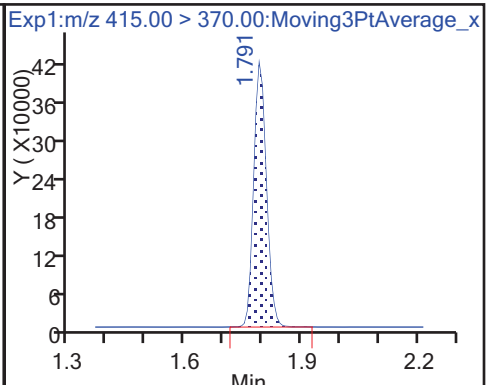
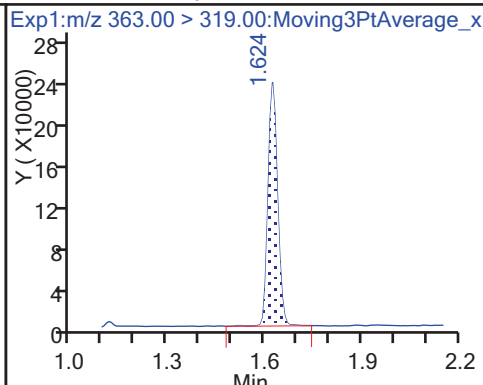
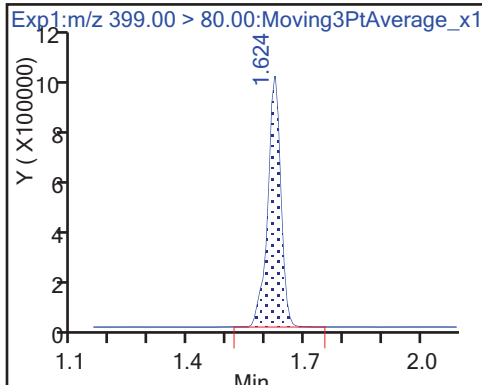
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

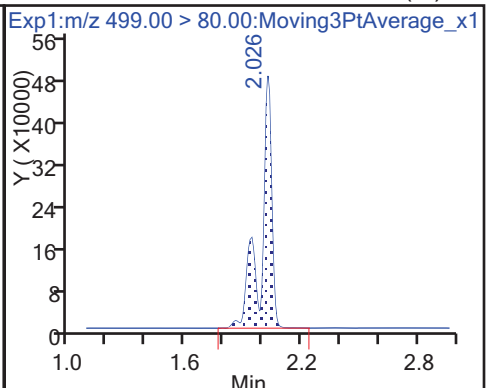
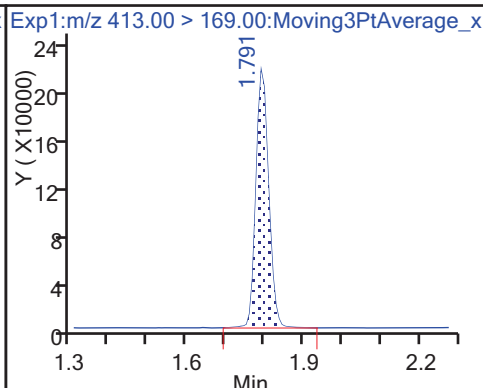
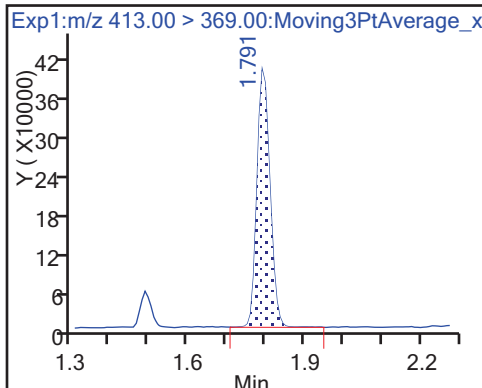
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

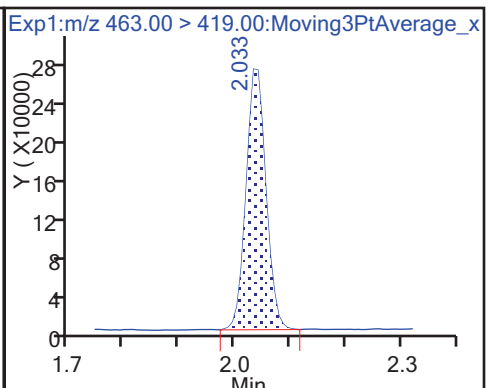
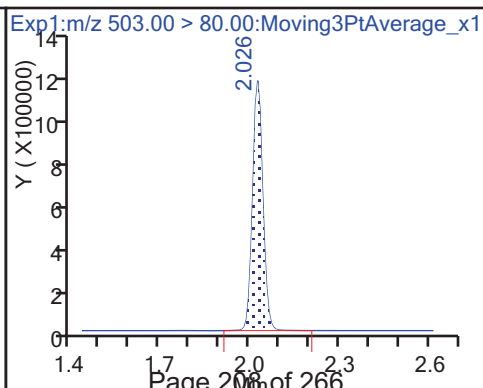
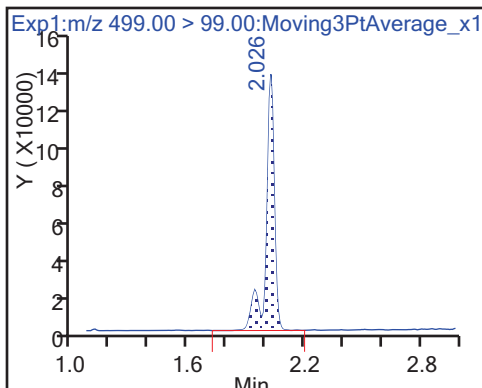
8 Perfluorooctane sulfonic acid (M)



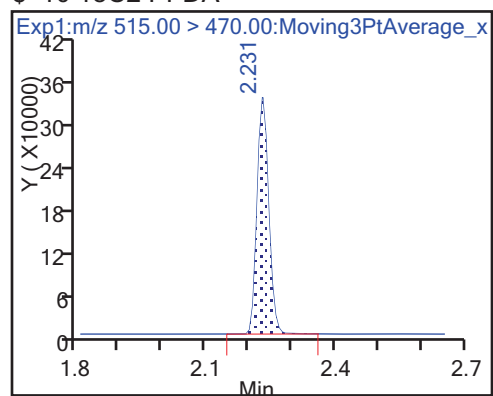
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_026.d

Injection Date: 15-Mar-2018 23:11:33

Instrument ID: A8_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 22

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

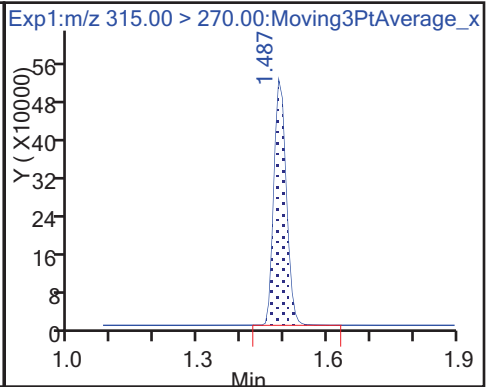
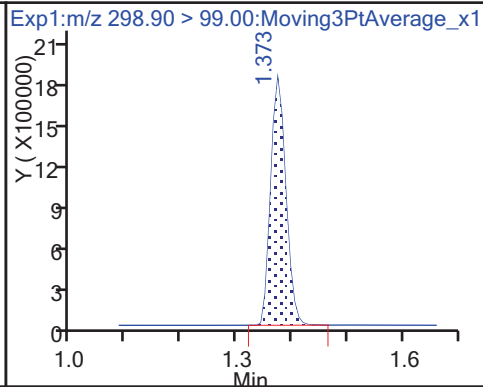
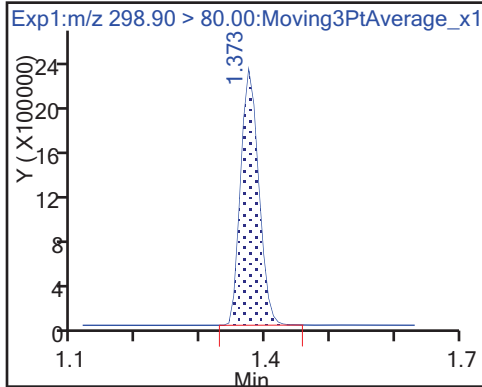
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

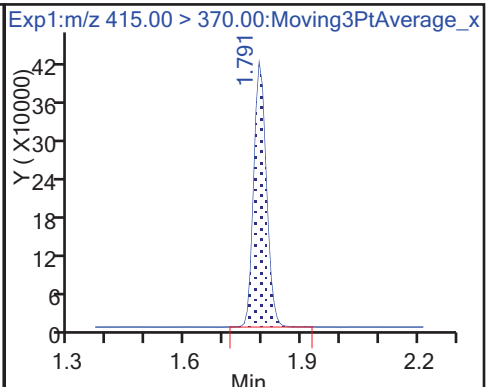
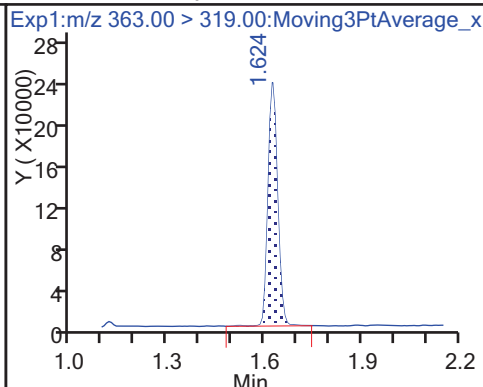
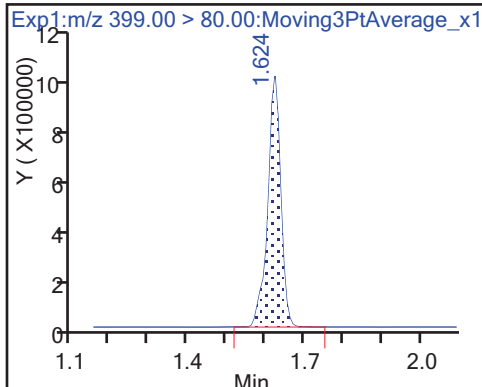
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

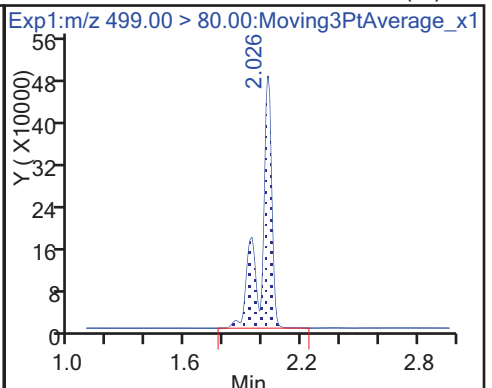
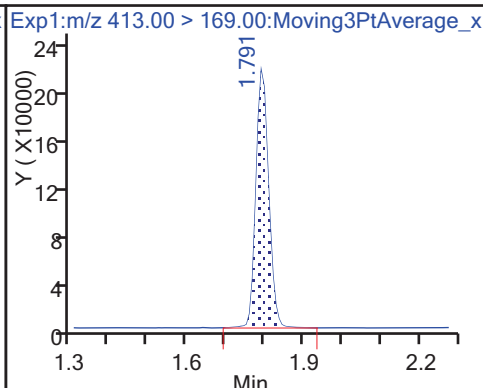
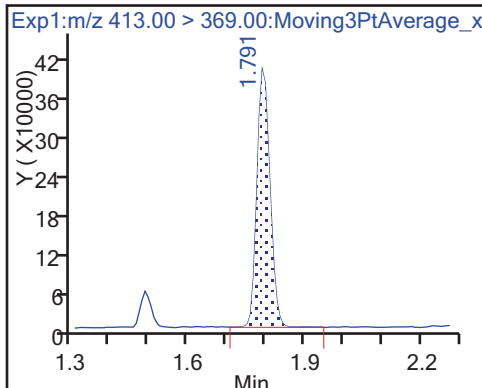
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

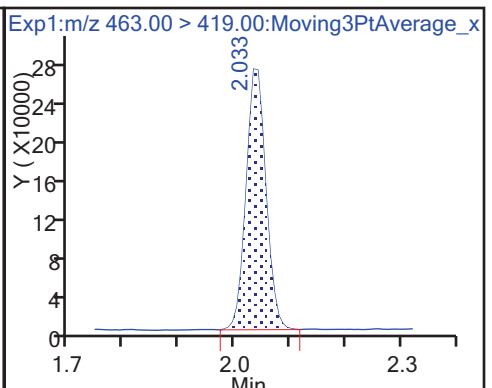
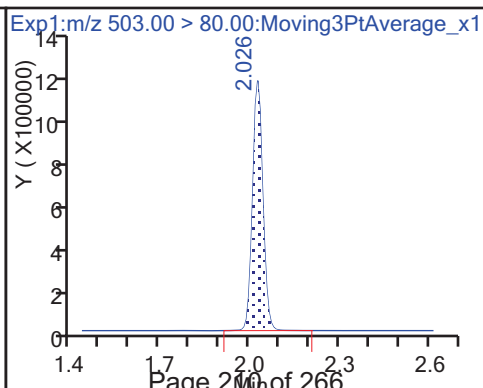
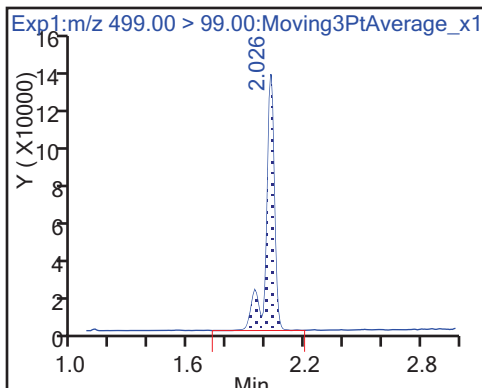
8 Perfluorooctane sulfonic acid (M)



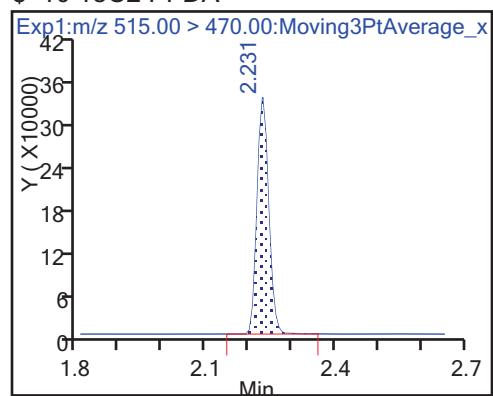
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

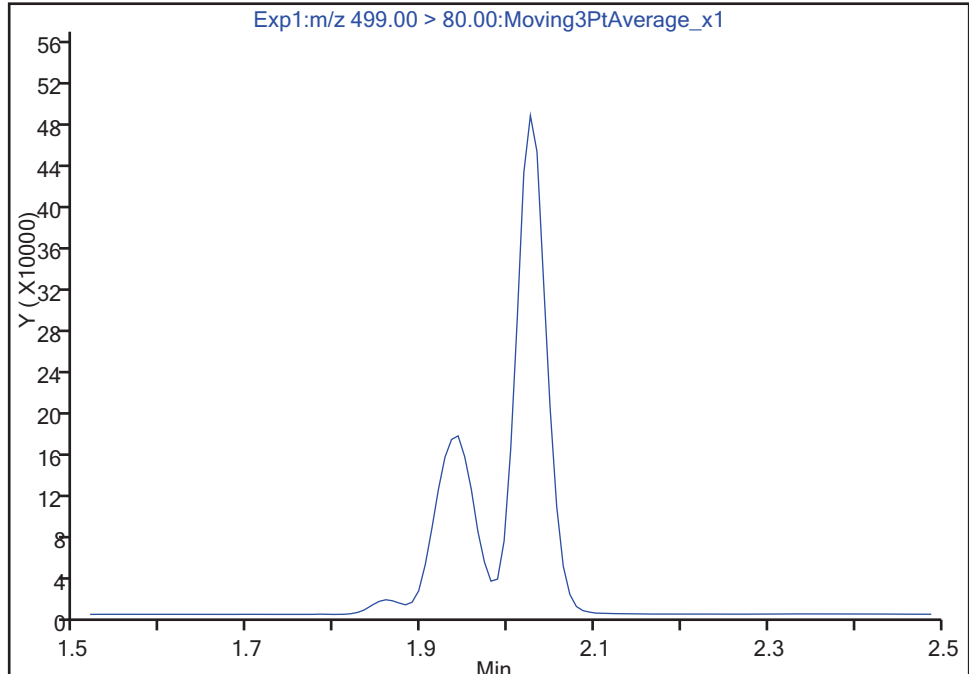
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Injection Date: 15-Mar-2018 23:11:33 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

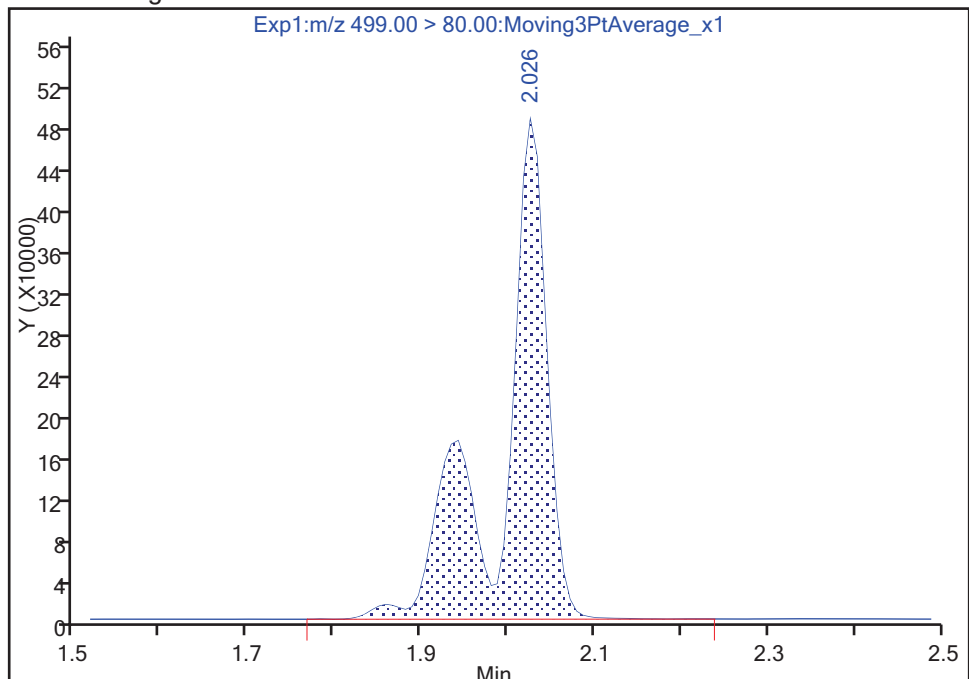
Not Detected
Expected RT: 2.03

Processing Integration Results



RT: 2.03
Area: 1789984
Amount: 19.806248
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 16-Mar-2018 10:14:03
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

TestAmerica Sacramento

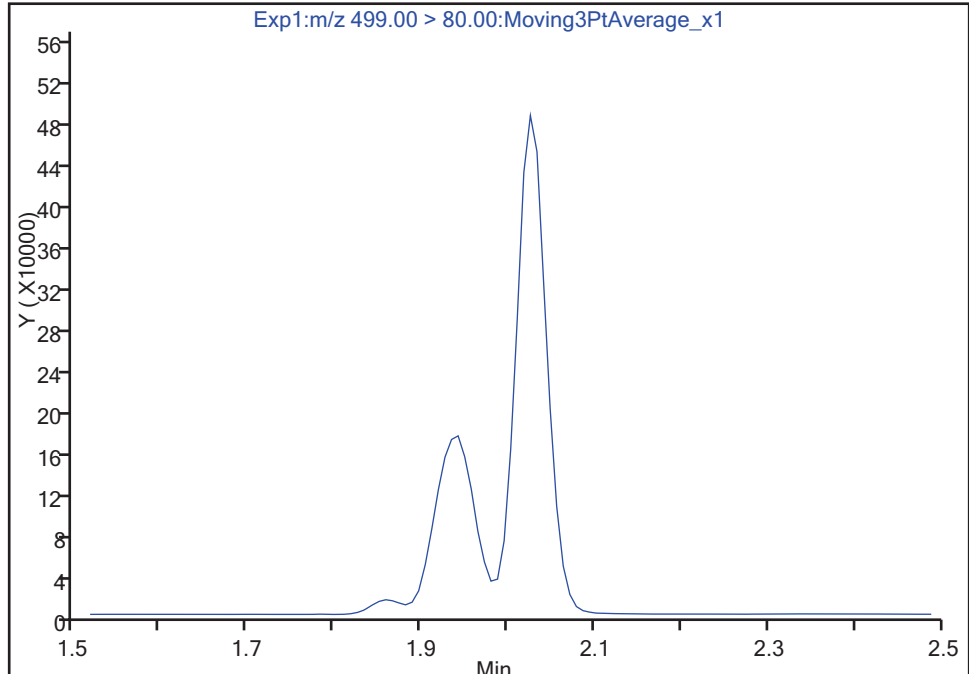
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_026.d
Injection Date: 15-Mar-2018 23:11:33 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

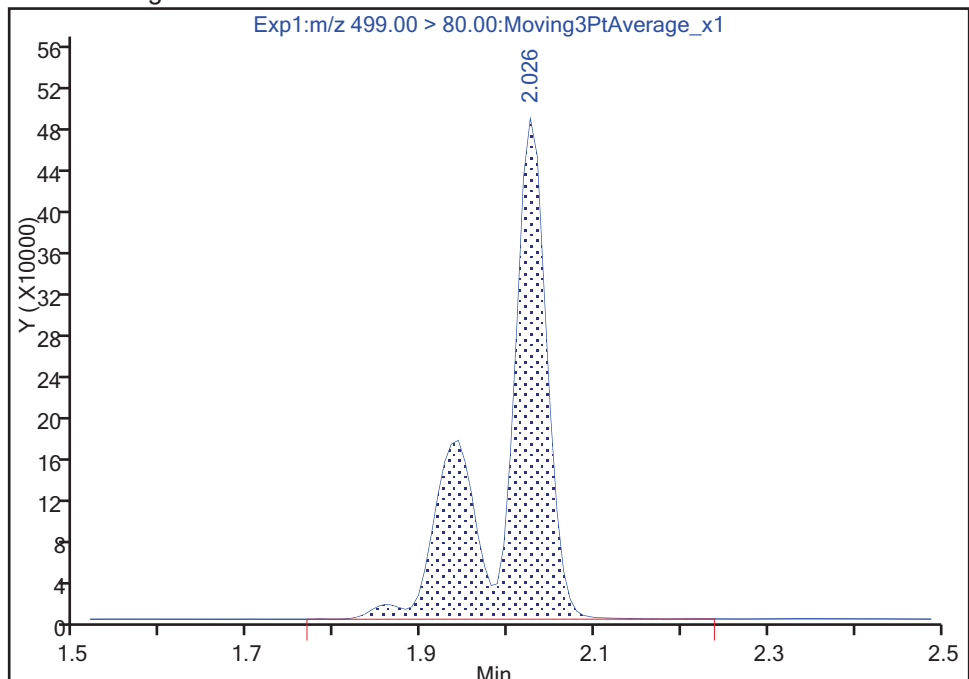
Not Detected
Expected RT: 2.03

Processing Integration Results



RT: 2.03
Area: 1789984
Amount: 19.806248
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 16-Mar-2018 10:14:03
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Lab Sample ID: CCV 320-213299/28 Calibration Date: 03/15/2018 23:39
 Instrument ID: A8_N Calib Start Date: 03/15/2018 11:30
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/15/2018 11:53
 Lab File ID: 2018.03.15_537AAX_032.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.9006		135	135	0.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.007	0.9714		14.5	15.0	-3.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.586	1.619		46.0	45.0	2.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9402	0.9455		30.3	30.2	0.6	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9474	0.9949		63.3	60.3	5.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7100	0.7160		30.3	30.0	0.8	30.0
13C2 PFHxA	Ave	1.092	1.072		9.81	10.0	-1.9	30.0
13C2 PFDA	Ave	0.6269	0.6189		9.87	10.0	-1.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_032.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 15-Mar-2018 23:39:37 ALS Bottle#: 5 Worklist Smp#: 28
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Mar-2018 10:22:54 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK015

First Level Reviewer: roycea

Date: 16-Mar-2018 07:57:03

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.373	0.0	1.000	11492676	135.3		13153	
298.90 > 99.00	1.373	1.373	0.0	1.000	8958871		1.28(0.00-0.00)	14336	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.479	0.0	1.000	1026953	9.81		13948	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.616	1.616	0.0	1.000	6888625	46.0		13769	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.616	1.616	0.0	1.000	1396728	14.5		268	
* 6 13C2-PFOA									
415.00 > 370.00	1.783	1.783	0.0		958419	10.0		9063	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.783	1.783	0.0	1.000	2733686	30.3		94.7	
413.00 > 169.00	1.783	1.783	0.0	1.000	1469352		1.86(0.00-0.00)	2197	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.026	2.026	0.0	1.000	5666434	63.3		5770	a
499.00 > 99.00	2.026	2.026	0.0	1.000	1152541		4.92(0.00-0.00)	993	a
* 7 13C4 PFOS									
503.00 > 80.00	2.026	2.026	0.0		2710914	28.7		7222	
9 Perfluorononanoic acid									
463.00 > 419.00	2.041	2.041	0.0	1.000	2059397	30.3		241	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.238	2.238	0.0	1.000	593116	9.87		1854	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

LC537-L5_00025

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_032.d

Injection Date: 15-Mar-2018 23:39:37

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 28

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

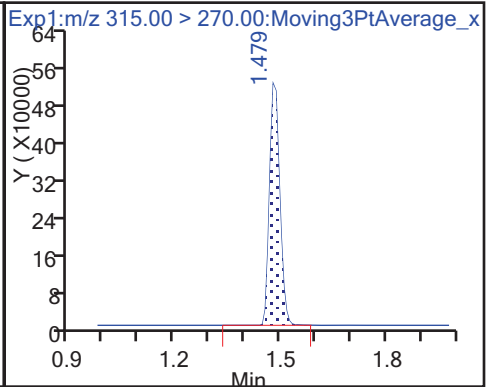
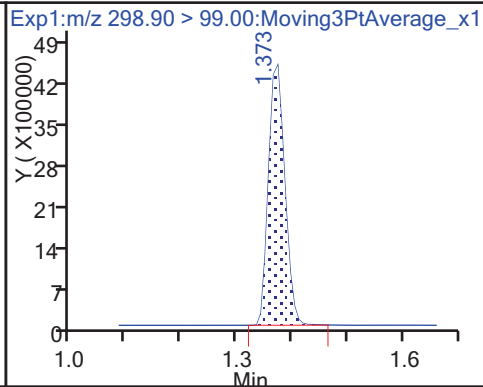
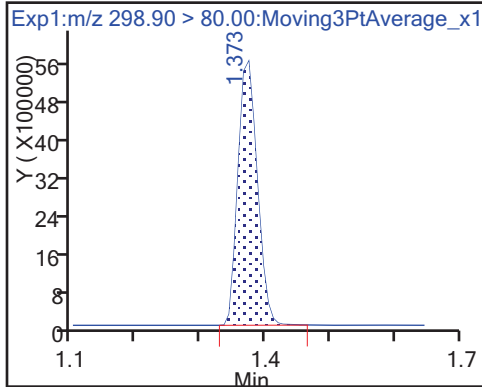
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

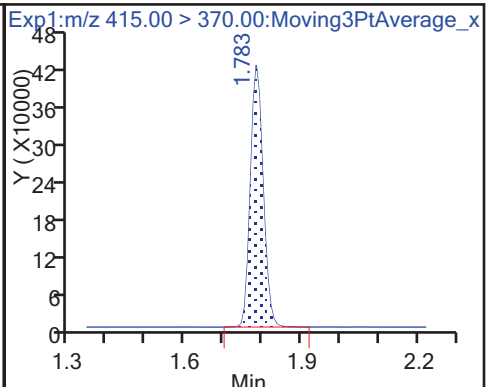
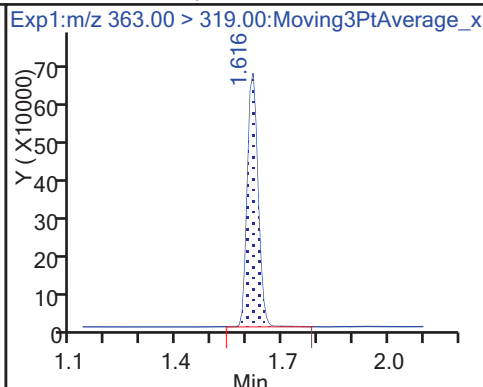
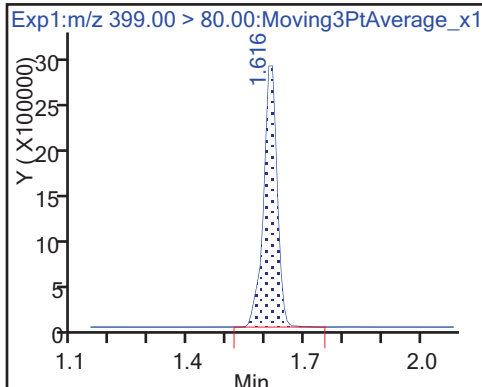
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

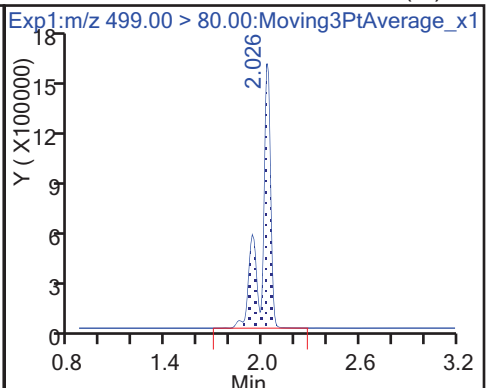
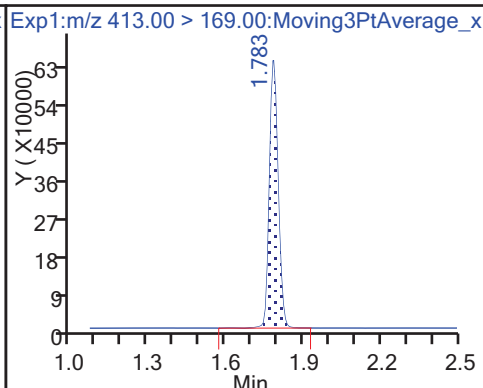
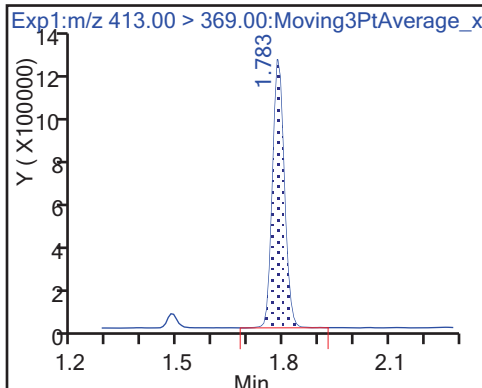
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

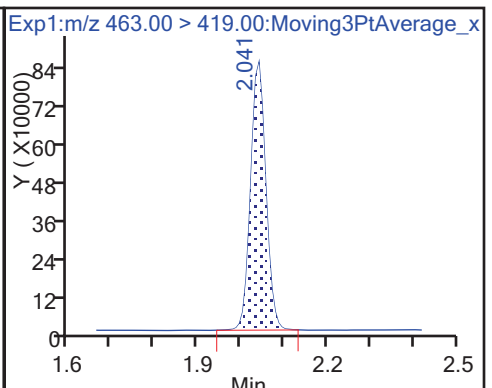
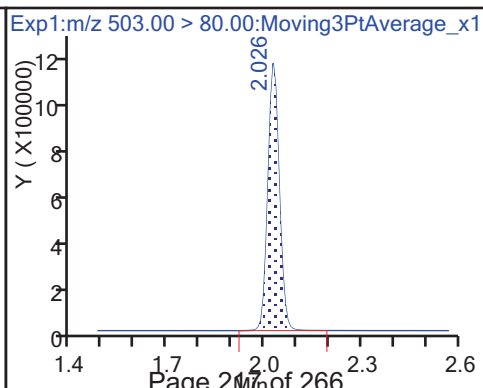
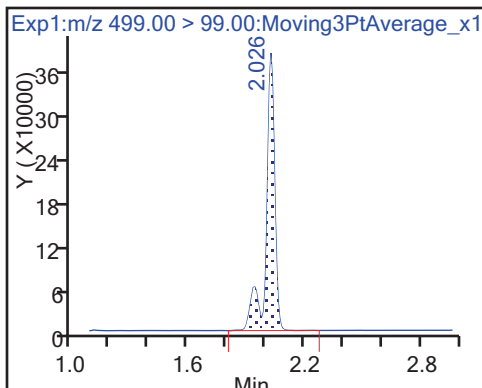
8 Perfluorooctane sulfonic acid (M)



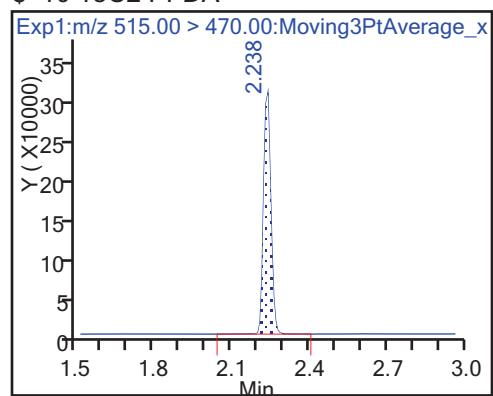
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

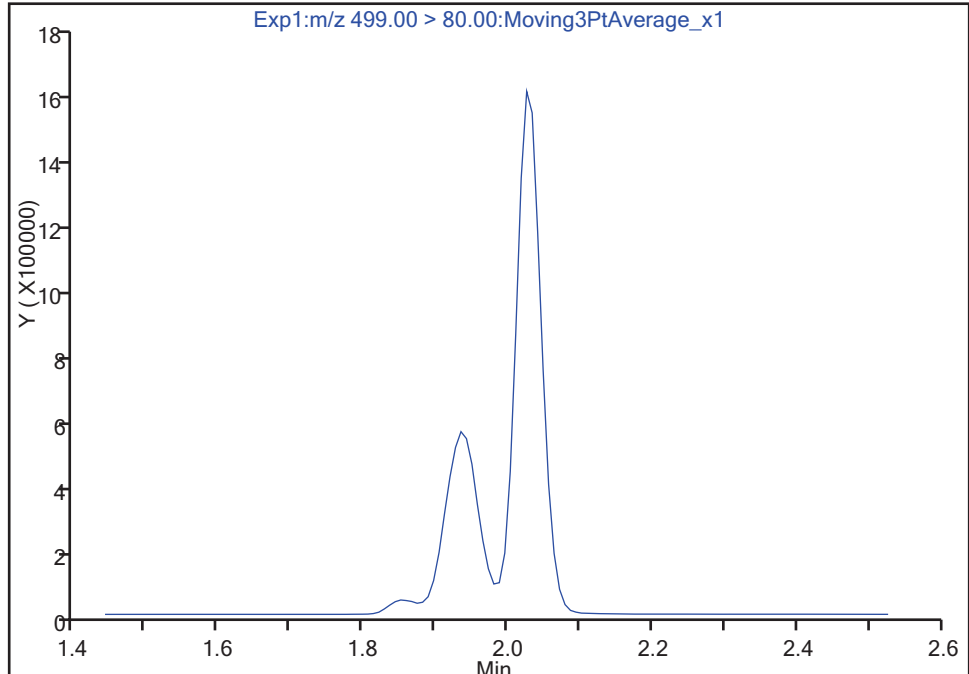
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Injection Date: 15-Mar-2018 23:39:37 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 28
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

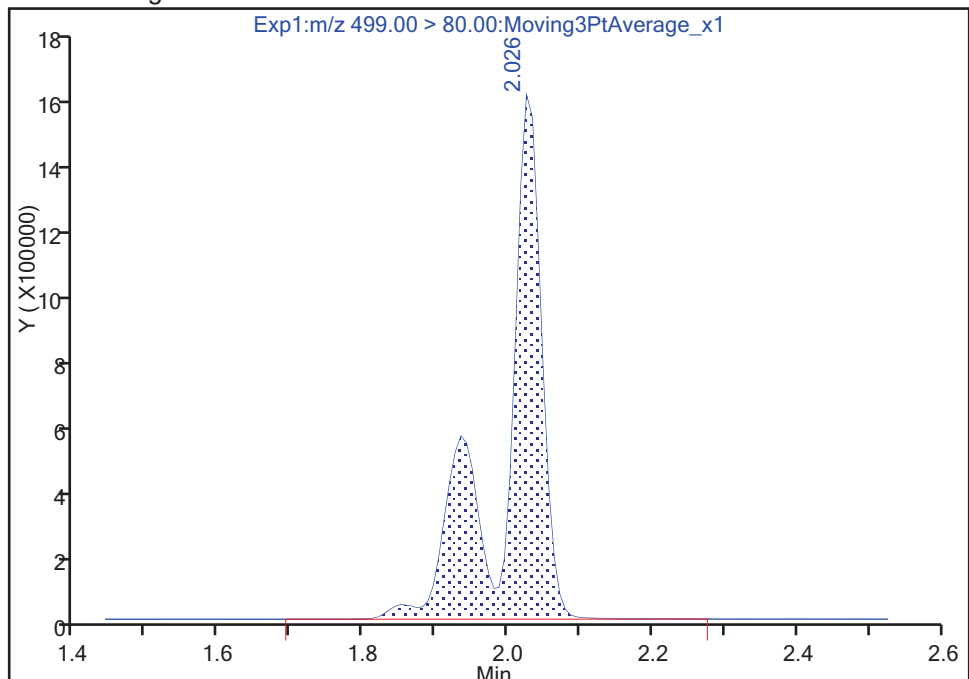
Signal: 1

Not Detected
Expected RT: 2.03

Processing Integration Results



Manual Integration Results



RT: 2.03
Area: 5666434
Amount: 63.276525
Amount Units: ng/ml

Reviewer: roycea, 16-Mar-2018 07:56:47

Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-212343/1-A
 Matrix: Water Lab File ID: 2018.03.15_537AAX_018.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 03/12/2018 07:09
 Sample wt/vol: 250 (mL) Date Analyzed: 03/15/2018 22:34
 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.: 213297 Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	108		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_018.d
 Lims ID: MB 320-212343/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 15-Mar-2018 22:34:03 ALS Bottle#: 10 Worklist Smp#: 14
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-212343/1
 Misc. Info.: Plate: 1 Rack: 6
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_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	1.495	-0.008	1.000	1019934	10.2		15797	
* 6 13C2-PFOA									
415.00 > 370.00	1.783	1.798	-0.015		914267	10.0		9010	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.026	-0.015		2506093	28.7		6570	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.231	-0.016	1.000	621759	10.8		2828	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_018.d

Injection Date: 15-Mar-2018 22:34:03

Instrument ID: A8_N

Lims ID: MB 320-212343/1-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 10

Worklist Smp#: 14

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

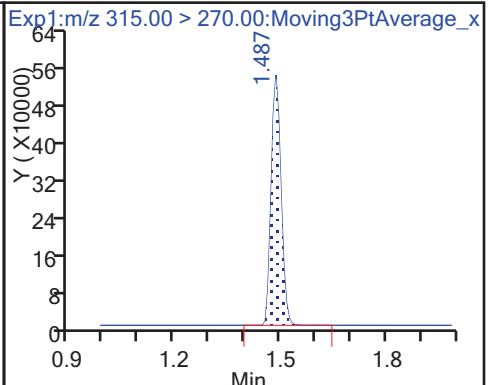
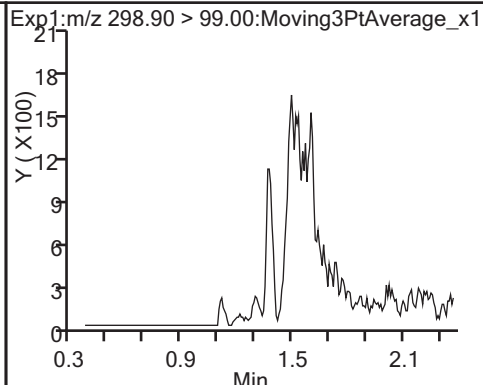
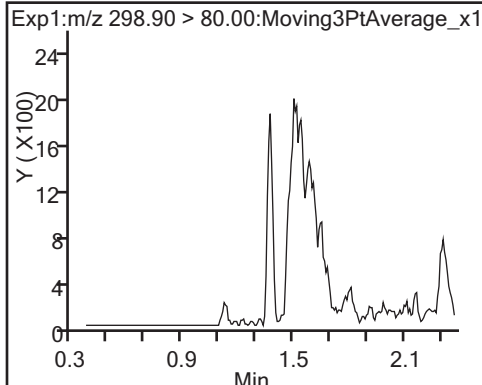
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

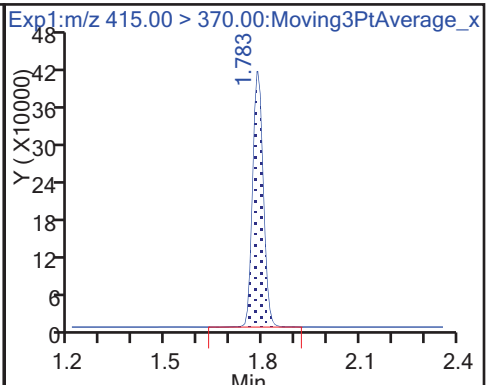
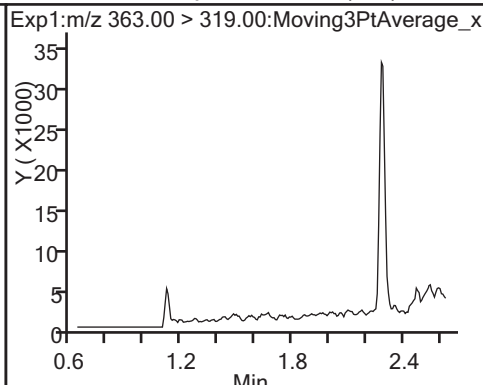
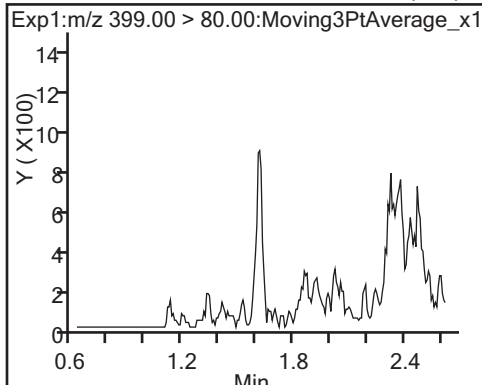
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

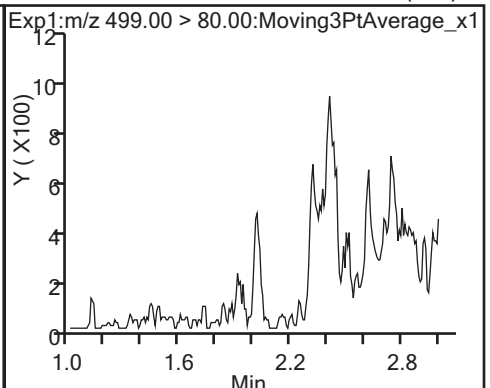
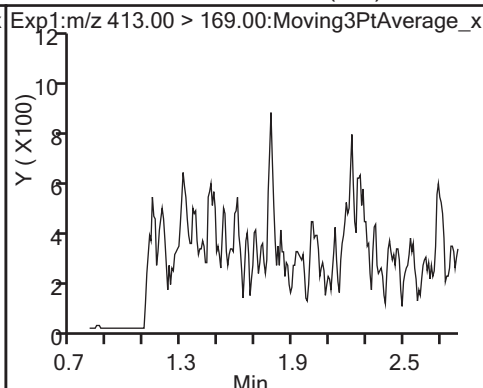
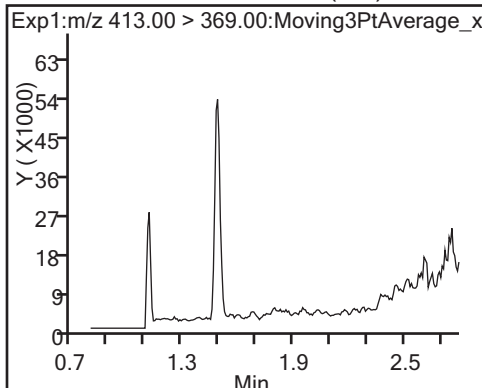
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

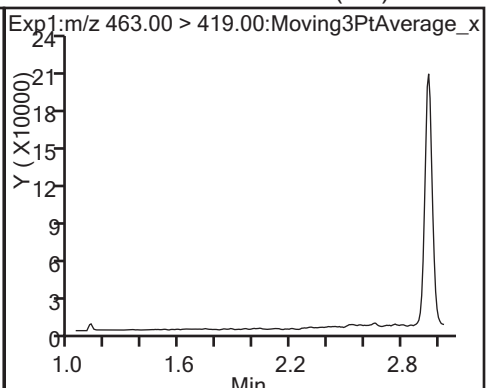
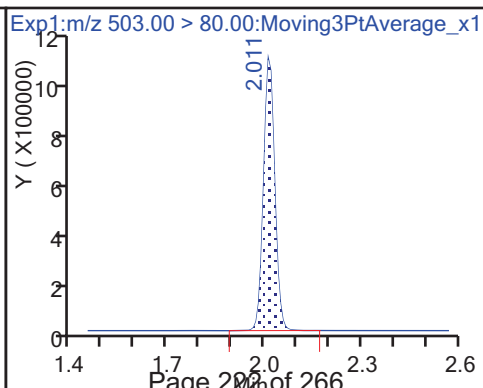
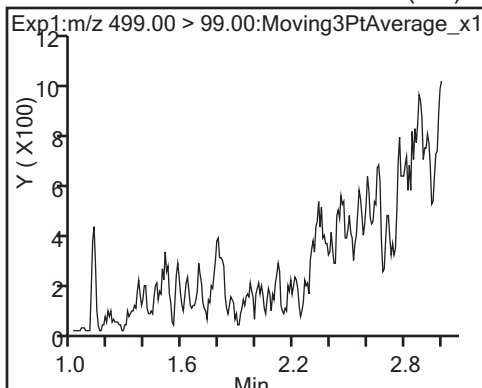
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

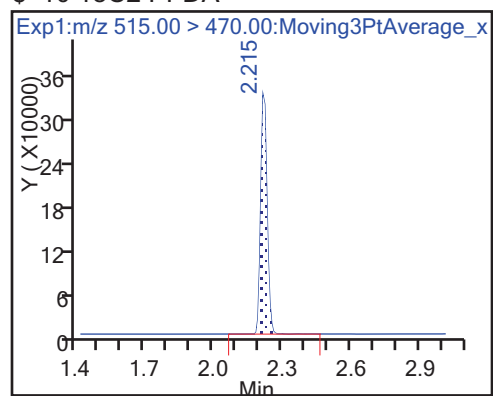


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_018.d
Lims ID: MB 320-212343/1-A
Client ID:
Sample Type: MB
Inject. Date: 15-Mar-2018 22:34:03 ALS Bottle#: 10 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-212343/1
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK015

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.2	102.18
\$ 10 13C2 PFDA	10.0	10.8	108.48

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 320-212343/2-A
 Matrix: Water Lab File ID: 2018.03.15_537AAX_019.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 03/12/2018 07:09
 Sample wt/vol: 250 (mL) Date Analyzed: 03/15/2018 22:38
 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.: 213297 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	149	M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	71.9		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	68.7		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	114		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	35.2		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	271		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	91		70-130
STL00996	13C2 PFDA	109		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_019.d
 Lims ID: LCS 320-212343/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 15-Mar-2018 22:38:44 ALS Bottle#: 11 Worklist Smp#: 15
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-212343/
 Misc. Info.: Plate: 1 Rack: 6
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK015

First Level Reviewer: barnettj

Date: 16-Mar-2018 10:16:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.373	0.008	1.000	6072603	67.7		8165	
298.90 > 99.00	1.381	1.373	0.008	1.000	4647881		1.31(0.00-0.00)	7805	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.495	0.0	1.000	945530	9.13		12279	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.624	0.0	1.000	4004088	28.4		8182	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.631	1.631	0.0	1.000	839794	8.79		147	
* 6 13C2-PFOA									
415.00 > 370.00	1.798	1.798	0.0		948188	10.0		10682	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.798	1.798	0.0	1.000	1603314	18.0		64.0	
413.00 > 169.00	1.798	1.798	0.0	1.000	838992		1.91(0.00-0.00)	1246	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.026	2.026	0.0	1.000	3135811	37.2		2879	a
499.00 > 99.00	2.026	2.026	0.0	1.000	659432		4.76(0.00-0.00)	523	a
* 7 13C4 PFOS									
503.00 > 80.00	2.026	2.026	0.0		2549209	28.7		5813	
9 Perfluorononanoic acid									
463.00 > 419.00	2.033	2.033	0.0	1.000	1155903	17.2		42.6	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.231	2.231	0.0	1.000	647076	10.9		2322	

QC Flag Legend

Review Flags

a - User Assigned ID

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_019.d

Injection Date: 15-Mar-2018 22:38:44

Instrument ID: A8_N

Lims ID: LCS 320-212343/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 11

Worklist Smp#: 15

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

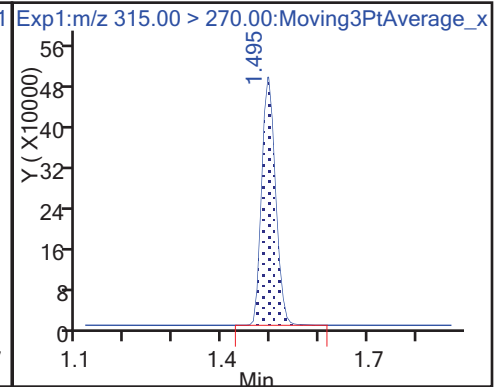
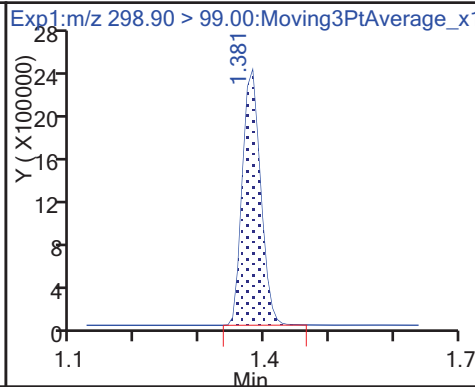
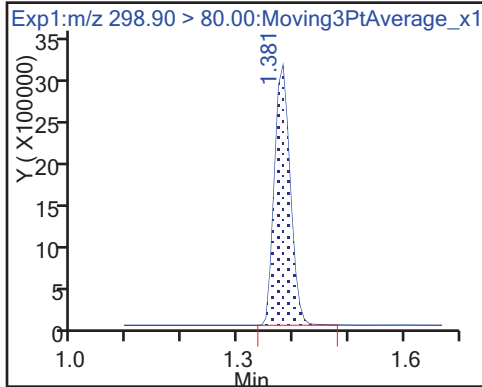
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

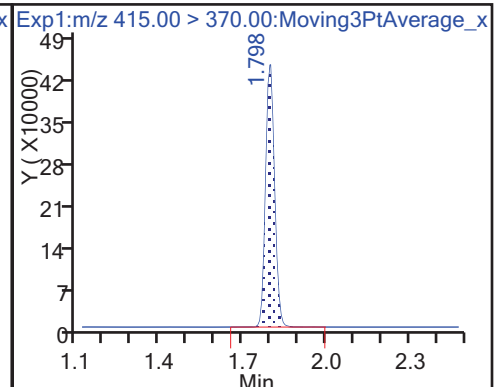
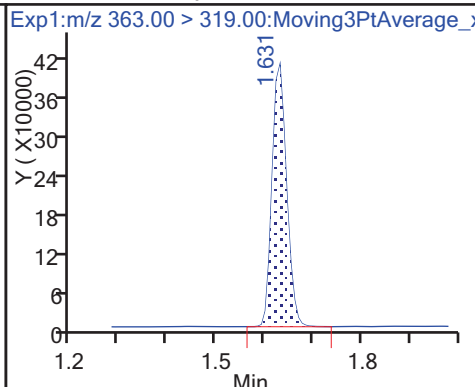
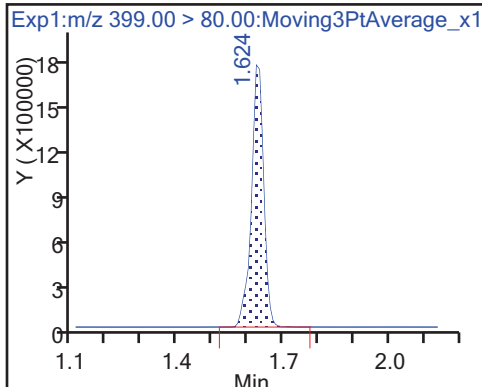
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

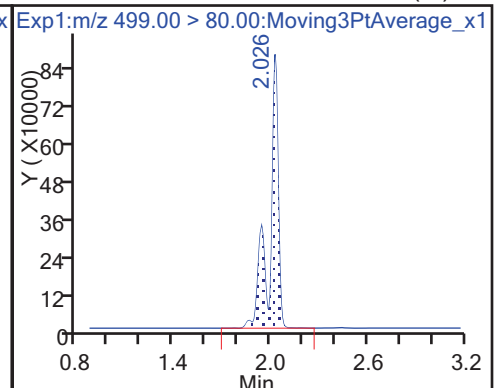
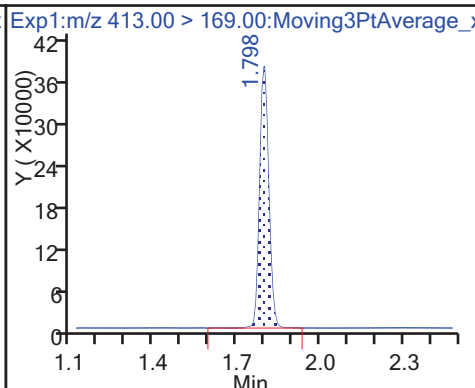
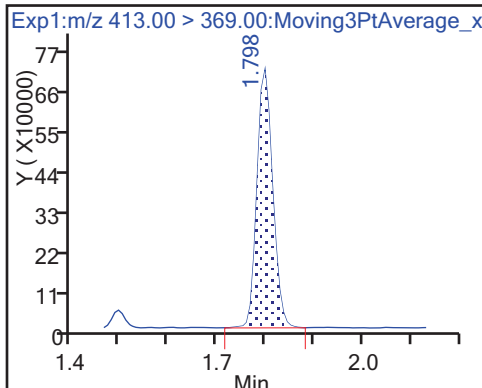
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

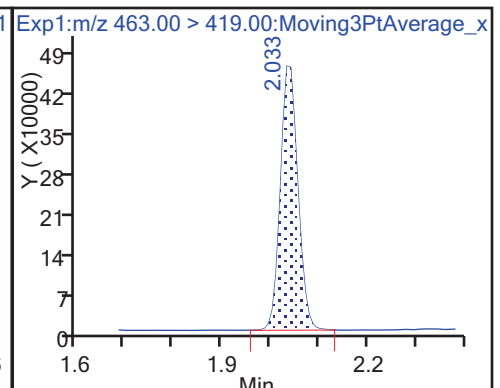
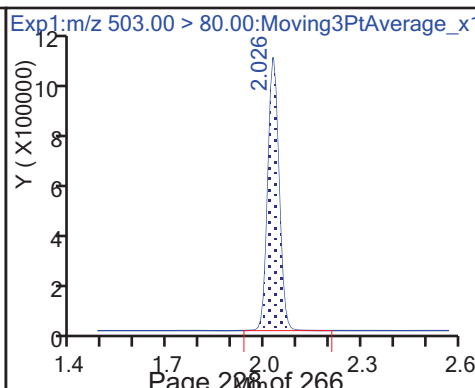
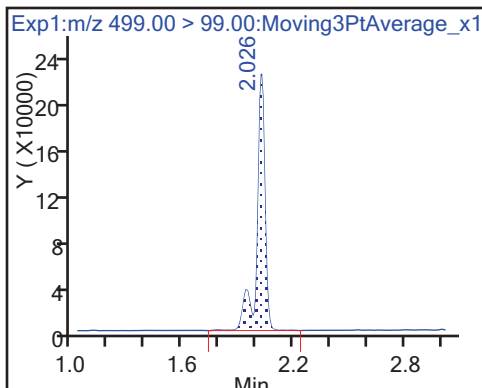
8 Perfluorooctane sulfonic acid (M)



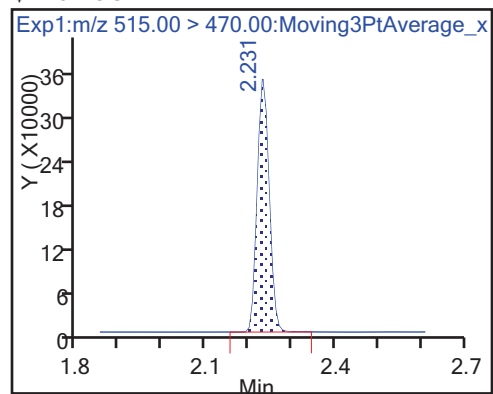
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_019.d
Lims ID: LCS 320-212343/2-A
Client ID:
Sample Type: LCS
Inject. Date: 15-Mar-2018 22:38:44 ALS Bottle#: 11 Worklist Smp#: 15
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-212343/
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 16-Mar-2018 10:22:40 Calib Date: 15-Mar-2018 11:53:25
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d
Column 1 : Det: EXP1
Process Host: XAWRK015

First Level Reviewer: barnettj

Date: 16-Mar-2018 10:16:34

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.13	91.33
\$ 10 13C2 PFDA	10.0	10.9	108.86

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_019.d

Injection Date: 15-Mar-2018 22:38:44

Instrument ID: A8_N

Lims ID: LCS 320-212343/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 11

Worklist Smp#: 15

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537_A8_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

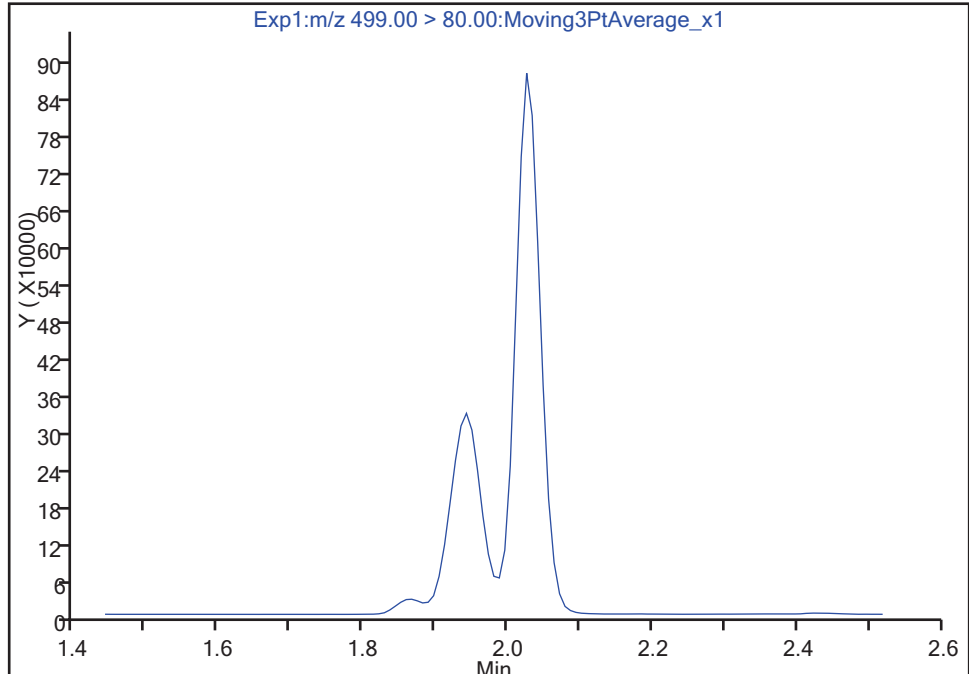
8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

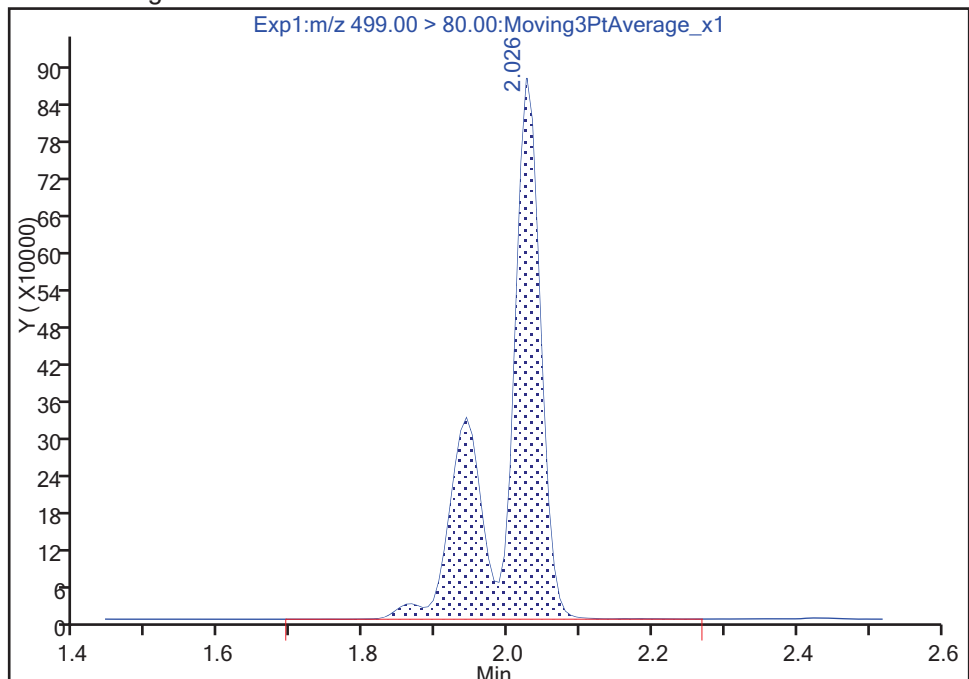
Not Detected

Expected RT: 2.03

Processing Integration Results



Manual Integration Results



RT: 2.03

Area: 3135811

Amount: 37.238567

Amount Units: ng/ml

Reviewer: barnettj, 16-Mar-2018 10:16:14

Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-RW-190 MS</u>	Lab Sample ID: <u>320-36794-7 MS</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_029.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 11:40</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>258.6(mL)</u>	Date Analyzed: <u>03/15/2018 23:25</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213299</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	153	M	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	83.0		19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	72.7		23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	104	M	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	38.8		9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	248		87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	112		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_029.d
 Lims ID: 320-36794-A-7-B MS
 Client ID: NAWC-030518-RW-190
 Sample Type: MS
 Inject. Date: 15-Mar-2018 23:25:32 ALS Bottle#: 19 Worklist Smp#: 25
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-36794-a-7-b ms
 Misc. Info.: Plate: 1 Rack: 6
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Mar-2018 10:22:49 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK015

First Level Reviewer: roycea

Date: 16-Mar-2018 07:56:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.366	1.373	-0.007	1.000	6355001	64.1		3986	
298.90 > 99.00	1.366	1.373	-0.007	1.000	4778215		1.33(0.00-0.00)	7342	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.487	1.487	0.0	1.000	895674	8.67		10056	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.624	0.0	1.000	4158206	26.8		2240	M
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.624	0.0	1.000	957701	10.0		146	
* 6 13C2-PFOA									
415.00 > 370.00	1.791	1.791	0.0		946494	10.0		9459	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.791	1.791	0.0	1.000	1910285	21.5		74.3	
413.00 > 169.00	1.791	1.791	0.0	1.000	1067196		1.79(0.00-0.00)	1448	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.011	2.026	-0.015	1.000	3659749	39.5		1681	a
499.00 > 99.00	2.011	2.026	-0.015	1.000	750256		4.88(0.00-0.00)	510	a
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.026	-0.015		2804232	28.7		2344	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.033	-0.015	1.000	1264089	18.8		26.7	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.231	-0.008	1.000	663716	11.2		2578	

QC Flag Legend

Review Flags

M - Manually Integrated

a - User Assigned ID

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_029.d

Injection Date: 15-Mar-2018 23:25:32

Instrument ID: A8_N

Lims ID: 320-36794-A-7-B MS

Client ID: NAWC-030518-RW-190

Operator ID: SACINSTLCMS01

ALS Bottle#: 19

Worklist Smp#: 25

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

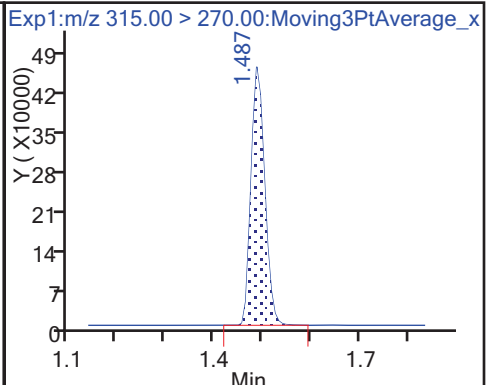
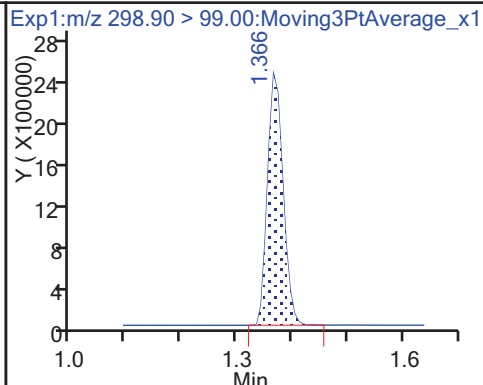
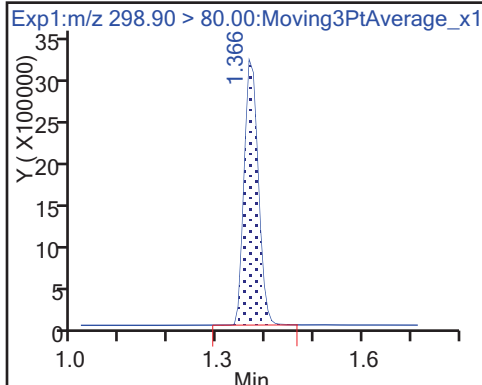
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

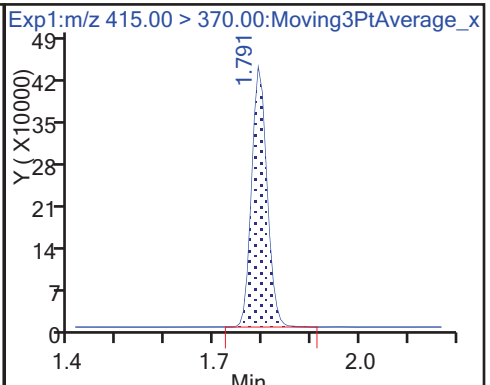
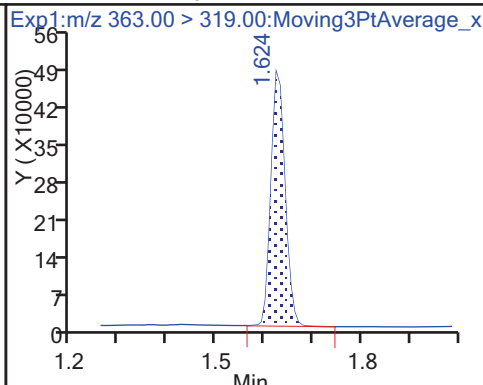
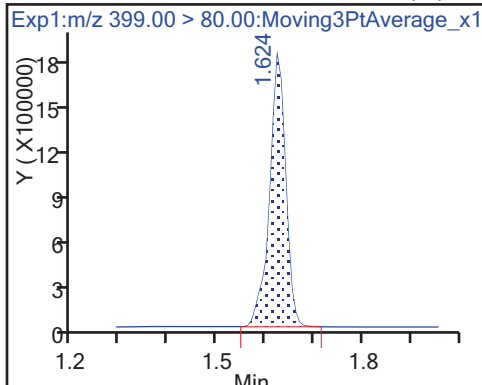
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (M)

4 Perfluoroheptanoic acid

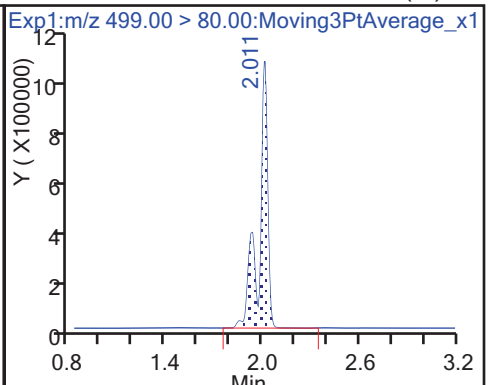
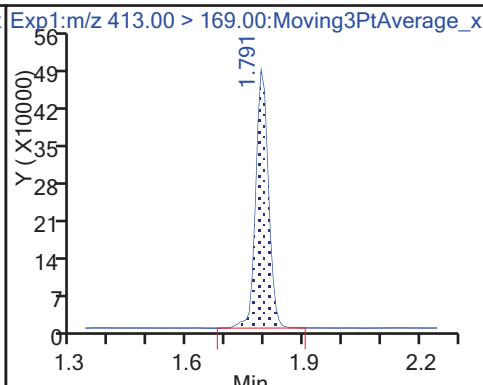
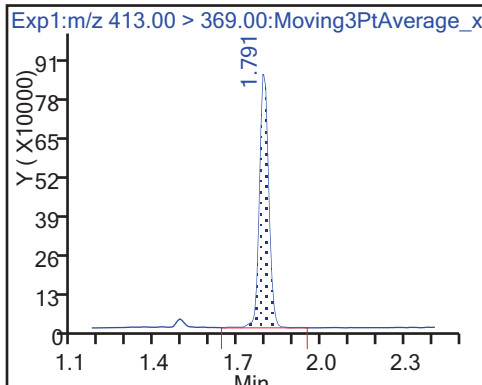
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

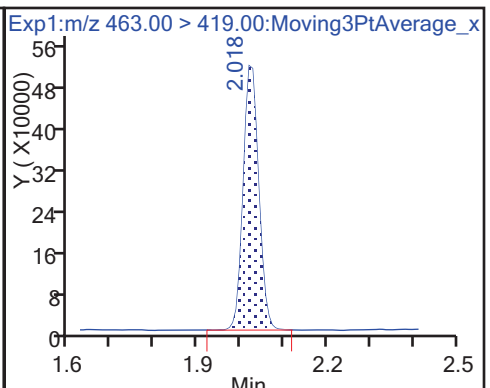
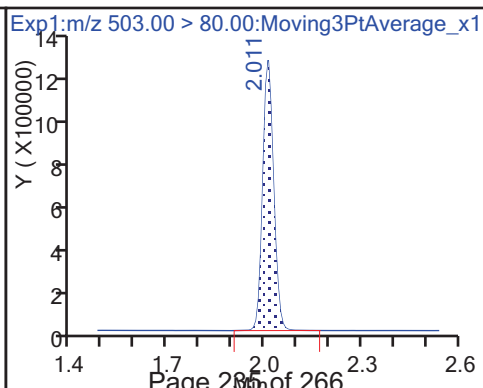
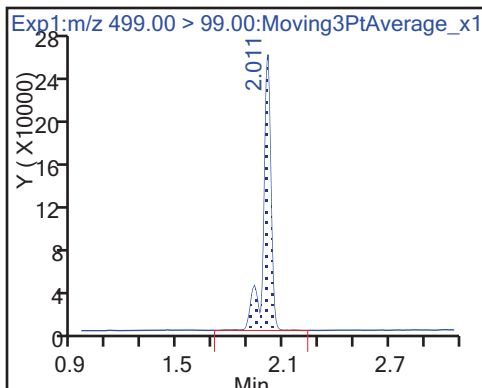
8 Perfluorooctane sulfonic acid (M)



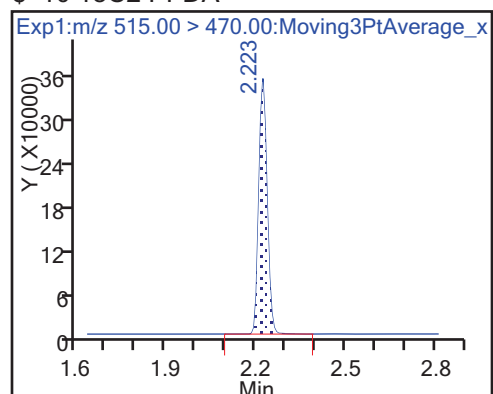
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_029.d
Lims ID: 320-36794-A-7-B MS
Client ID: NAWC-030518-RW-190
Sample Type: MS
Inject. Date: 15-Mar-2018 23:25:32 ALS Bottle#: 19 Worklist Smp#: 25
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-36794-a-7-b ms
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 16-Mar-2018 10:22:49 Calib Date: 15-Mar-2018 11:53:25
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d
Column 1 : Det: EXP1
Process Host: XAWRK015

First Level Reviewer: roycea

Date: 16-Mar-2018 07:56:04

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.67	86.67
\$ 10 13C2 PFDA	10.0	11.2	111.86

TestAmerica Sacramento

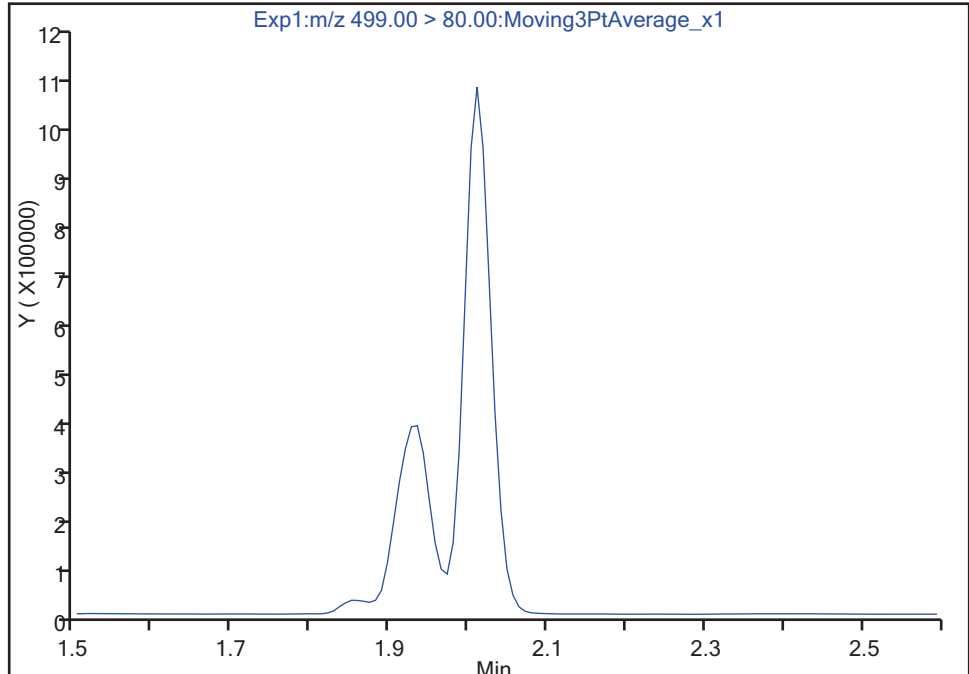
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_029.d
Injection Date: 15-Mar-2018 23:25:32 Instrument ID: A8_N
Lims ID: 320-36794-A-7-B MS
Client ID: NAWC-030518-RW-190
Operator ID: SACINSTLCMS01 ALS Bottle#: 19 Worklist Smp#: 25
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

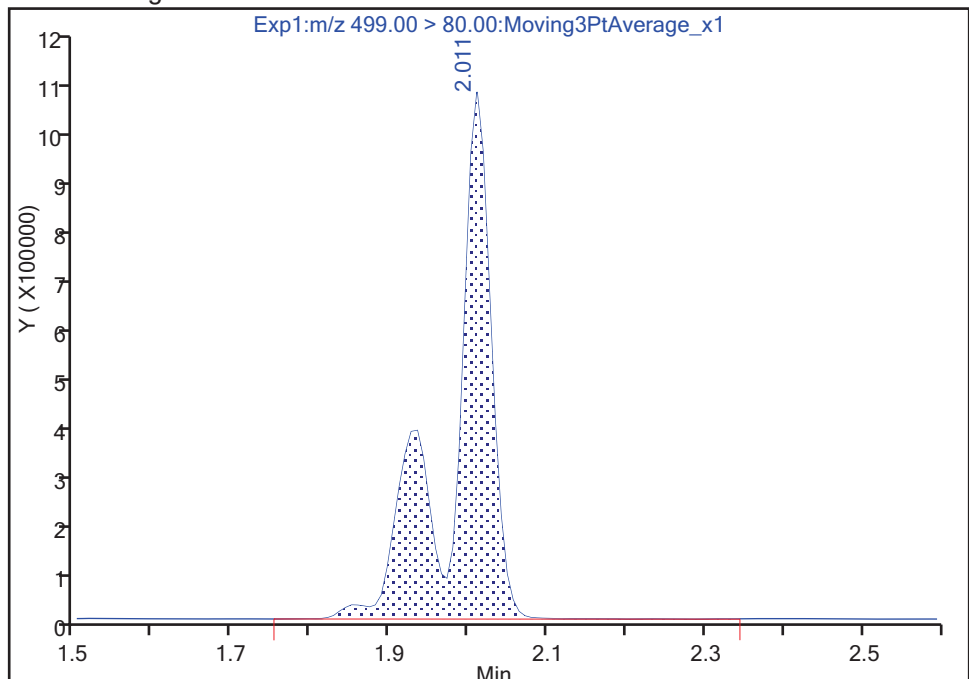
Not Detected
Expected RT: 2.03

Processing Integration Results



RT: 2.01
Area: 3659749
Amount: 39.508076
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 16-Mar-2018 07:55:34

Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

TestAmerica Sacramento

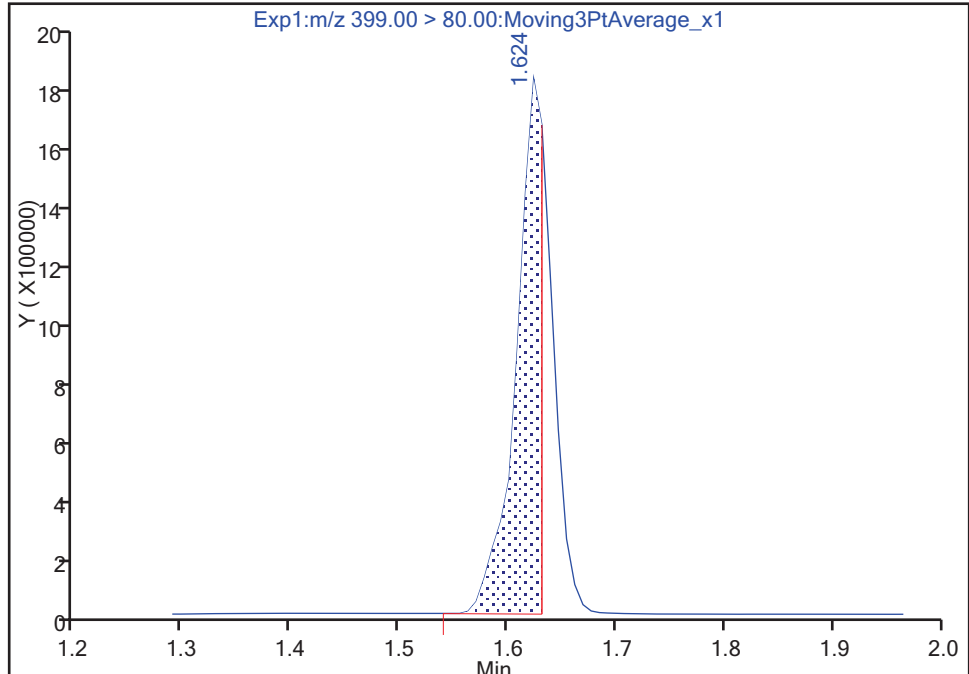
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_029.d
Injection Date: 15-Mar-2018 23:25:32 Instrument ID: A8_N
Lims ID: 320-36794-A-7-B MS
Client ID: NAWC-030518-RW-190
Operator ID: SACINSTLCMS01 ALS Bottle#: 19 Worklist Smp#: 25
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

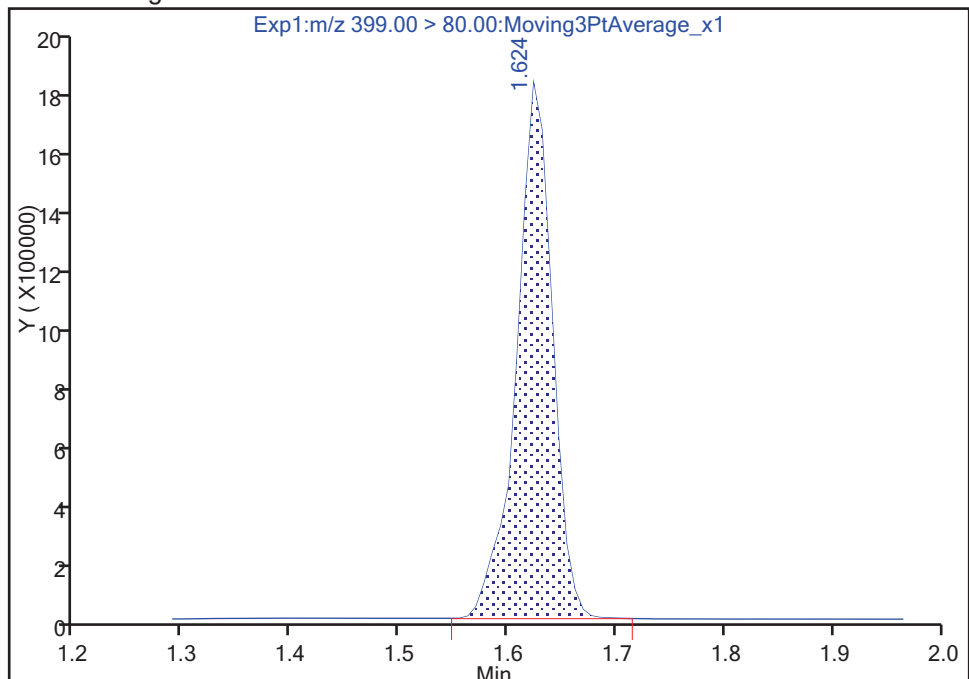
RT: 1.62
Area: 2790063
Amount: 17.994042
Amount Units: ng/ml

Processing Integration Results



RT: 1.62
Area: 4158206
Amount: 26.817650
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 16-Mar-2018 10:20:56
Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-RW-190 MSD</u>	Lab Sample ID: <u>320-36794-7 MSD</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_030.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 11:40</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>274.1 (mL)</u>	Date Analyzed: <u>03/15/2018 23:30</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213299</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	147	M	36	15	6.2
335-67-1	Perfluorooctanoic acid (PFOA)	77.3		18	7.3	2.6
375-95-1	Perfluorononanoic acid (PFNA)	66.3		22	18	7.3
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	105		27	11	5.0
375-85-9	Perfluoroheptanoic acid (PFHpA)	35.7		9.1	3.6	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	283		82	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	107		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_030.d
 Lims ID: 320-36794-A-7-C MSD
 Client ID: NAWC-030518-RW-190
 Sample Type: MSD
 Inject. Date: 15-Mar-2018 23:30:14 ALS Bottle#: 20 Worklist Smp#: 26
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-36794-a-7-c msd
 Misc. Info.: Plate: 1 Rack: 6
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Mar-2018 10:22:49 Calib Date: 15-Mar-2018 11:53:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK015

First Level Reviewer: roycea

Date: 16-Mar-2018 07:56:27

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.373	0.0	1.000	7149636	77.5		5803	
298.90 > 99.00	1.373	1.373	0.0	1.000	5280391		1.35(0.00-0.00)	7303	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.487	0.008	1.000	987968	9.52		13572	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.631	1.624	0.007	1.000	4222885	28.7		2212	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.631	1.624	0.007	1.000	936858	9.78		137	
* 6 13C2-PFOA									
415.00 > 370.00	1.798	1.791	0.007		950505	10.0		8809	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.798	1.791	0.007	1.000	1894606	21.2		63.2	
413.00 > 169.00	1.798	1.791	0.007	1.000	1035547		1.83(0.00-0.00)	1425	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.026	2.026	0.0	1.000	3539607	40.2		1773	a
499.00 > 99.00	2.026	2.026	0.0	1.000	722190		4.90(0.00-0.00)	471	a
* 7 13C4 PFOS									
503.00 > 80.00	2.026	2.026	0.0		2664243	28.7		2141	
9 Perfluorononanoic acid									
463.00 > 419.00	2.033	2.033	0.0	1.000	1226671	18.2		28.0	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.231	-0.008	1.000	635285	10.7		2866	

QC Flag Legend

Review Flags

a - User Assigned ID

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_030.d

Injection Date: 15-Mar-2018 23:30:14

Instrument ID: A8_N

Lims ID: 320-36794-A-7-C MSD

Client ID: NAWC-030518-RW-190

Operator ID: SACINSTLCMS01

ALS Bottle#: 20

Worklist Smp#: 26

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

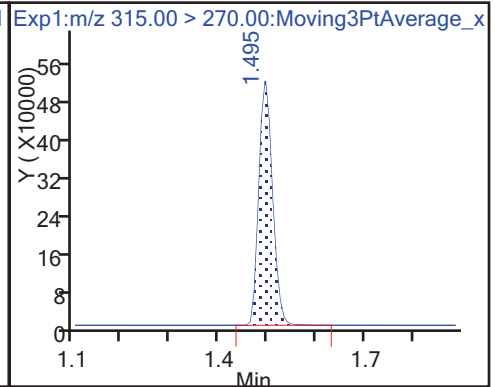
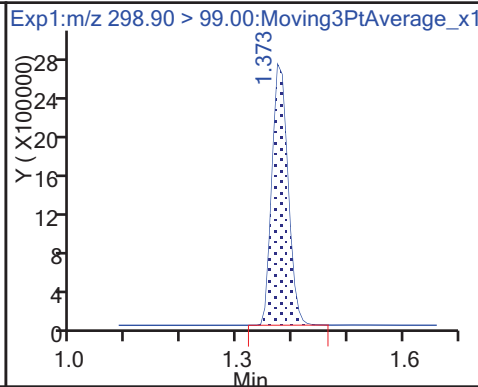
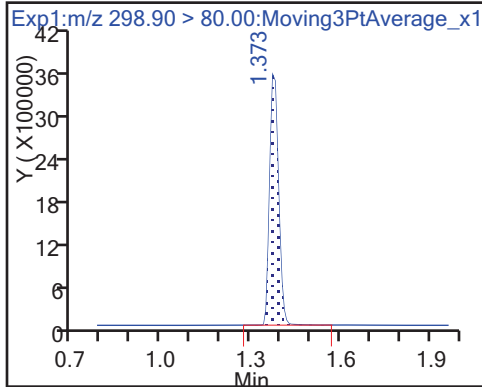
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

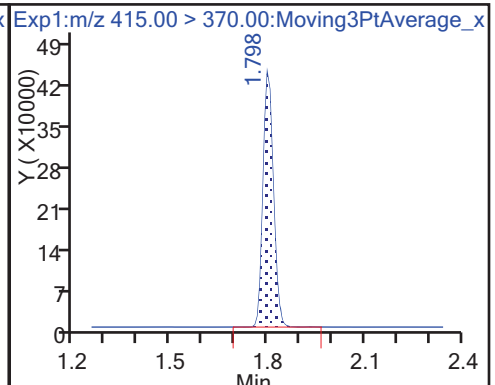
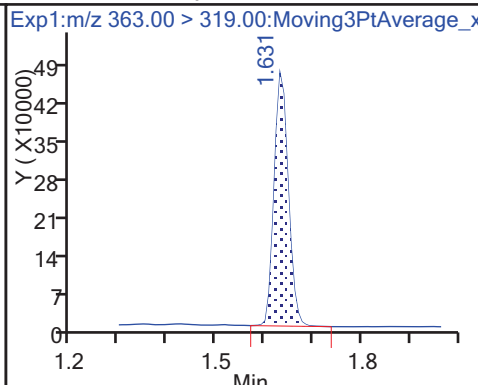
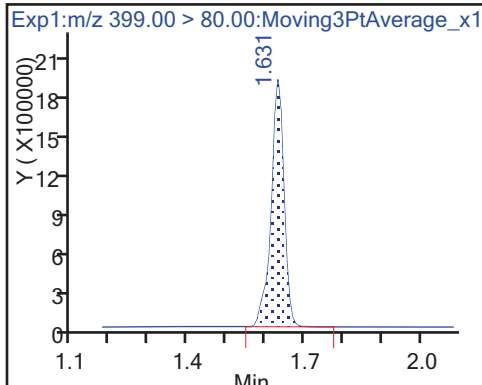
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

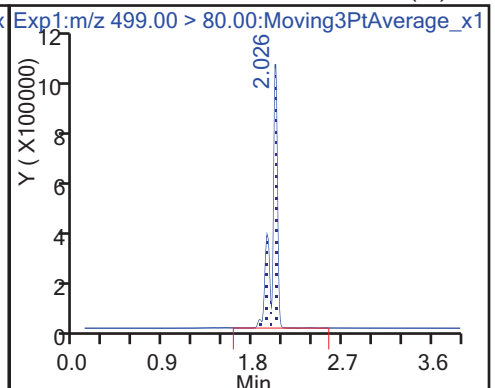
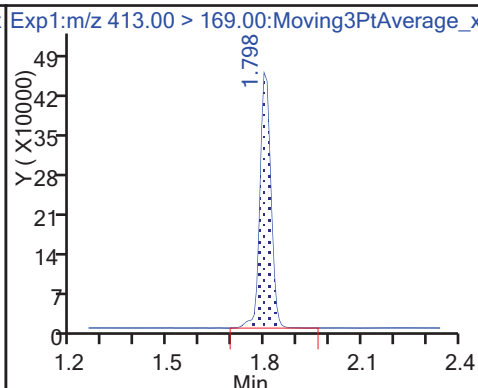
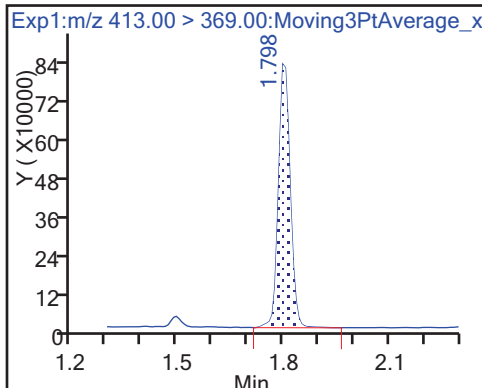
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

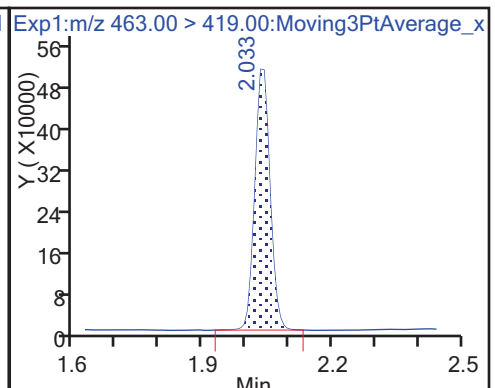
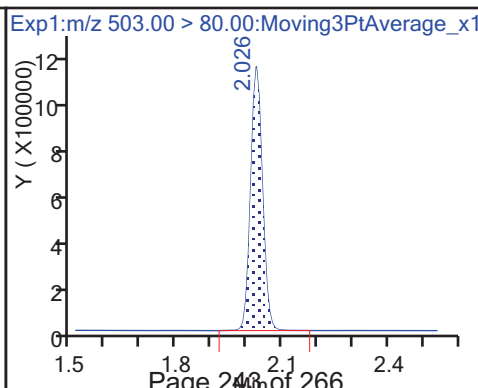
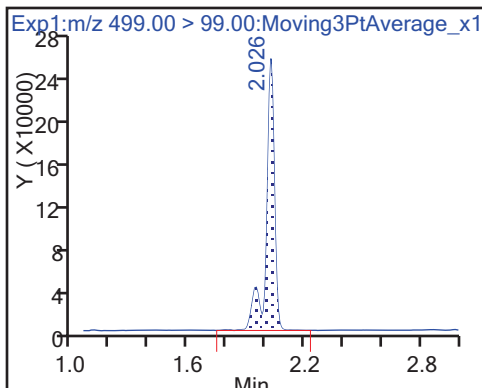
8 Perfluorooctane sulfonic acid (M)



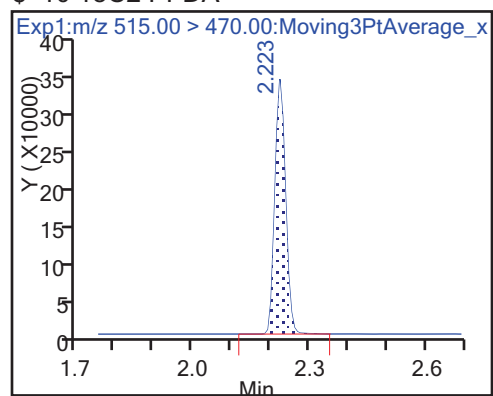
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_030.d
Lims ID: 320-36794-A-7-C MSD
Client ID: NAWC-030518-RW-190
Sample Type: MSD
Inject. Date: 15-Mar-2018 23:30:14 ALS Bottle#: 20 Worklist Smp#: 26
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-36794-a-7-c msd
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 16-Mar-2018 10:22:49 Calib Date: 15-Mar-2018 11:53:25
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180315-55366.b\2018.03.15_537ICAL_009.d
Column 1 : Det: EXP1
Process Host: XAWRK015

First Level Reviewer: roycea

Date: 16-Mar-2018 07:56:27

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.52	95.20
\$ 10 13C2 PFDA	10.0	10.7	106.61

TestAmerica Sacramento

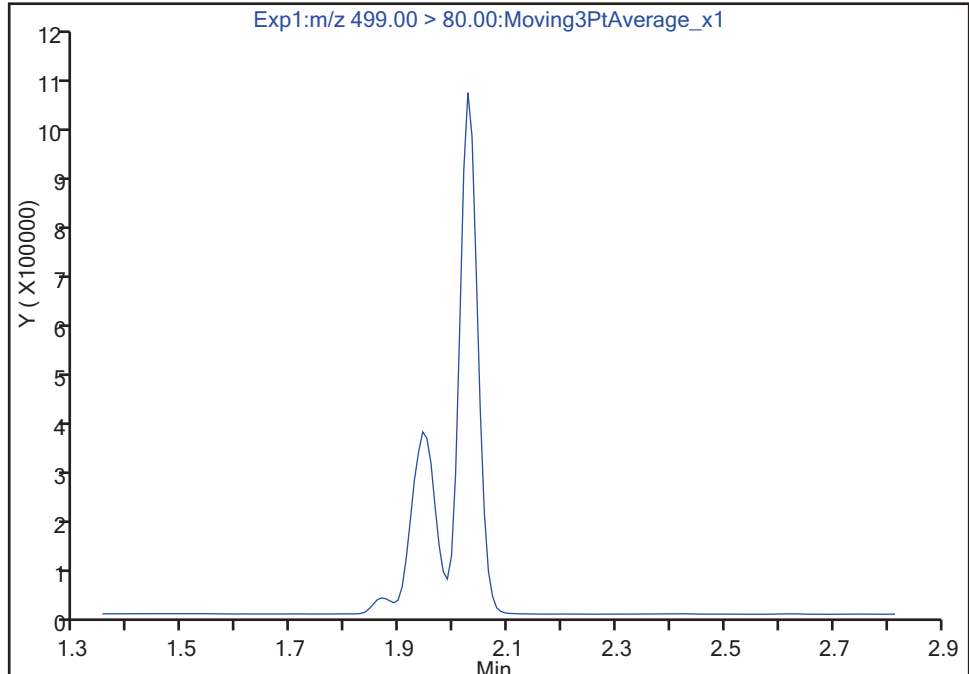
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b\2018.03.15_537AAX_030.d
Injection Date: 15-Mar-2018 23:30:14 Instrument ID: A8_N
Lims ID: 320-36794-A-7-C MSD
Client ID: NAWC-030518-RW-190
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 26
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

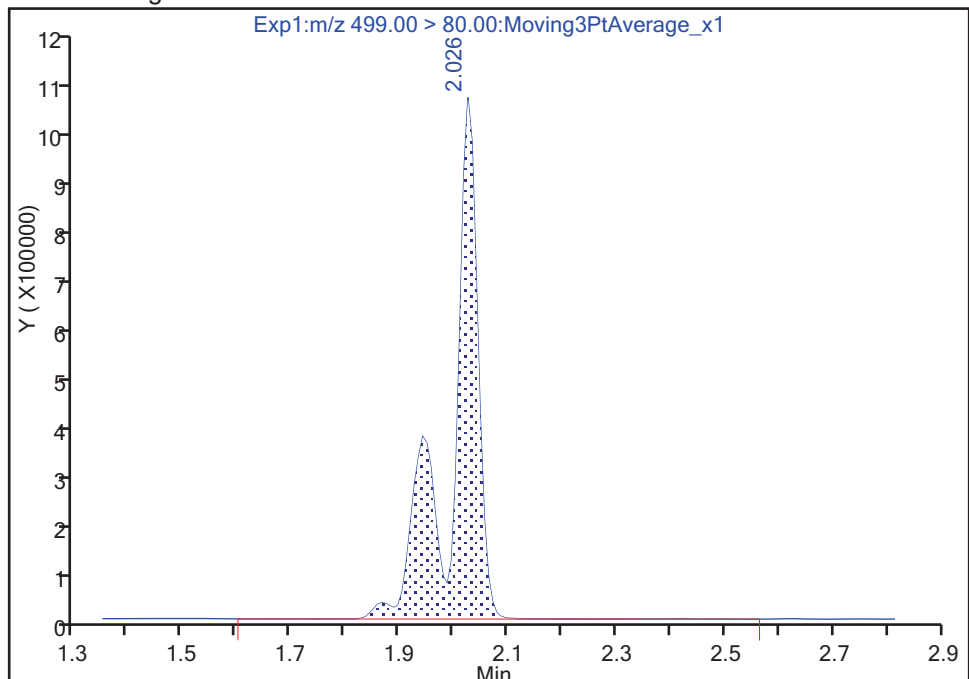
Not Detected
Expected RT: 2.03

Processing Integration Results



RT: 2.03
Area: 3539607
Amount: 40.218858
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 16-Mar-2018 07:56:07

Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-36794-1

SDG No.: _____

Instrument ID: A8_NStart Date: 03/15/2018 11:30Analysis Batch Number: 213143End Date: 03/15/2018 14:35

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-213143/4		03/15/2018 11:30	1	2018.03.15_537I CAL 004.d	GeminiC18 3x100 3(mm)
IC 320-213143/5		03/15/2018 11:34	1	2018.03.15_537I CAL 005.d	GeminiC18 3x100 3(mm)
IC 320-213143/6		03/15/2018 11:39	1	2018.03.15_537I CAL 006.d	GeminiC18 3x100 3(mm)
IC 320-213143/7 ICISAV		03/15/2018 11:44	1	2018.03.15_537I CAL 007.d	GeminiC18 3x100 3(mm)
IC 320-213143/8		03/15/2018 11:48	1	2018.03.15_537I CAL 008.d	GeminiC18 3x100 3(mm)
IC 320-213143/9		03/15/2018 11:53	1	2018.03.15_537I CAL 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		03/15/2018 11:58	1		GeminiC18 3x100 3(mm)
CCVL 320-213143/11		03/15/2018 12:02	1	2018.03.15_537I CAL 011.d	GeminiC18 3x100 3(mm)
ZZZZZ		03/15/2018 12:07	1		GeminiC18 3x100 3(mm)
ICV 320-213143/13		03/15/2018 14:35	1	2018.03.15_537I CALA 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Instrument ID: A8_N Start Date: 03/15/2018 22:24Analysis Batch Number: 213297 End Date: 03/15/2018 23:11

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-213297/12 CCVIS		03/15/2018 22:24	1	2018.03.15_537A AX 016.d	GeminiC18 3x100 3(mm)
MB 320-212343/1-A		03/15/2018 22:34	1	2018.03.15_537A AX 018.d	GeminiC18 3x100 3(mm)
LCS 320-212343/2-A		03/15/2018 22:38	1	2018.03.15_537A AX 019.d	GeminiC18 3x100 3(mm)
320-36794-1		03/15/2018 22:43	1	2018.03.15_537A AX 020.d	GeminiC18 3x100 3(mm)
320-36794-2		03/15/2018 22:48	1	2018.03.15_537A AX 021.d	GeminiC18 3x100 3(mm)
320-36794-3		03/15/2018 22:52	1	2018.03.15_537A AX 022.d	GeminiC18 3x100 3(mm)
320-36794-4		03/15/2018 22:57	1	2018.03.15_537A AX 023.d	GeminiC18 3x100 3(mm)
320-36794-5		03/15/2018 23:02	1	2018.03.15_537A AX 024.d	GeminiC18 3x100 3(mm)
320-36794-6		03/15/2018 23:06	1	2018.03.15_537A AX 025.d	GeminiC18 3x100 3(mm)
CCV 320-213297/22 CCVIS		03/15/2018 23:11	1	2018.03.15_537A AX 026.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Instrument ID: A8_N Start Date: 03/15/2018 23:11Analysis Batch Number: 213299 End Date: 03/15/2018 23:39

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-213299/22 CCVIS		03/15/2018 23:11	1	2018.03.15_537A AX 026.d	GeminiC18 3x100 3(mm)
320-36794-7		03/15/2018 23:20	1	2018.03.15_537A AX 028.d	GeminiC18 3x100 3(mm)
320-36794-7 MS		03/15/2018 23:25	1	2018.03.15_537A AX 029.d	GeminiC18 3x100 3(mm)
320-36794-7 MSD		03/15/2018 23:30	1	2018.03.15_537A AX 030.d	GeminiC18 3x100 3(mm)
320-36794-8		03/15/2018 23:34	1	2018.03.15_537A AX 031.d	GeminiC18 3x100 3(mm)
CCV 320-213299/28 CCVIS		03/15/2018 23:39	1	2018.03.15_537A AX 032.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Batch Number: 212343 Batch Start Date: 03/12/18 07:09 Batch Analyst: Kouchari, ShamiranBatch Method: 537 Batch End Date: 03/13/18 17:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00052
MB 320-212343/1		537, 537				250 mL	1.00 mL	7 SU	100 uL
LCS 320-212343/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-36794-A-1	NAWC-030518-RW-055	537, 537	T	286.27 g	29.34 g	256.9 mL	1.00 mL	7 SU	100 uL
320-36794-A-2	NAWC-030518-FRB-055	537, 537	T	290.19 g	28.85 g	261.3 mL	1.00 mL	7 SU	100 uL
320-36794-A-3	NAWC-030518-RW-124	537, 537	T	276.68 g	29.33 g	247.4 mL	1.00 mL	7 SU	100 uL
320-36794-A-4	NAWC-030518-FRB-124	537, 537	T	281.91 g	28.78 g	253.1 mL	1.00 mL	7 SU	100 uL
320-36794-A-5	NAWC-030518-RW-201	537, 537	T	291.25 g	31.05 g	260.2 mL	1.00 mL	7 SU	100 uL
320-36794-A-6	NAWC-030518-FRB-201	537, 537	T	286.49 g	29.27 g	257.2 mL	1.00 mL	7 SU	100 uL
320-36794-A-7	NAWC-030518-RW-190	537, 537	T	291.72 g	31.07 g	260.7 mL	1.00 mL	7 SU	100 uL
320-36794-A-7 MS	NAWC-030518-RW-190	537, 537	T	288.06 g	29.48 g	258.6 mL	1.00 mL	7 SU	100 uL
320-36794-A-7 MSD	NAWC-030518-RW-190	537, 537	T	303.07 g	29.02 g	274.1 mL	1.00 mL	7 SU	100 uL
320-36794-A-8	NAWC-030518-FRB-190	537, 537	T	309.19 g	30.77 g	278.4 mL	1.00 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-MSP 00032	LC537-SU 00062	AnalysisComment			
MB 320-212343/1		537, 537			100 uL	Chlorine, ND			
LCS 320-212343/2		537, 537		100 uL	100 uL	Chlorine, ND			
320-36794-A-1	NAWC-030518-RW-055	537, 537	T		100 uL	Chlorine, ND			
320-36794-A-2	NAWC-030518-FRB-055	537, 537	T		100 uL	Chlorine, ND			
320-36794-A-3	NAWC-030518-RW-124	537, 537	T		100 uL	Chlorine, ND			
320-36794-A-4	NAWC-030518-FRB-124	537, 537	T		100 uL	Chlorine, ND			
320-36794-A-5	NAWC-030518-RW-201	537, 537	T		100 uL	Chlorine, ND			
320-36794-A-6	NAWC-030518-FRB-201	537, 537	T		100 uL	Chlorine, ND			

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

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Batch Number: 212343 Batch Start Date: 03/12/18 07:09 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 03/13/18 17:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-MSP 00032	LC537-SU 00062	AnalysisComment			
320-36794-A-7	NAWC-030518-RW-190	537, 537	T		100 uL	Chlorine, ND			
320-36794-A-7 MS	NAWC-030518-RW-190	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-36794-A-7 MSD	NAWC-030518-RW-190	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-36794-A-8	NAWC-030518-FRB-190	537, 537	T		100 uL	Chlorine, ND			

Batch Notes	
Analyst ID - Aliquot Step	VPM
Batch Comment	Client labels match TA labels, 03/12/18 SKD
Analyst ID - Concentration	SKD/KMK
Analyst ID - Final Volume Step	VPM
Internal Standard ID#	1048713
Manifold ID	1
Methanol ID	1175203
pH Indicator ID	3817
Pipette ID	H14930F
Analyst ID - IS Reagent Drop	KMK
Analyst ID - IS Reagent Drop Witness	JER
Analyst ID - SU Reagent Drop	HJA
Analyst ID - SU Reagent Drop Witness	KMK
Analyst ID - TA Reagent Drop	HJA
Analyst ID - TA Reagent Drop Witness	KMK
SPE Cartridge Lot ID	6369499
Trizma ID	SLBR5241V
Reagent Water ID	03/08/18

Basis	Basis Description
T	Total/NA

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

Job No: 36794 Instrument ID & Date: A8 3-15-18 ICAL Batch: 213143
 Extraction Batch: 212343 Worklist #: 55402 TALS Batch: 213297, 213299

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

1st Level Reviewer / Date: JRB 3-16-18

2nd Level Reviewer / Date: CBW 3-16-18

NCM # and Comments: _____

A8

Instrument ID & Date: 3/15/18 Worklist#: 55366

ICAL Batch: 213143, 213144 Calibration ID number: 38167, 38168

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

1st Level Reviewer / Date: JRB 3-15-18

2nd Level Reviewer / Date: CBW 3-15-18

NCM # and Comments: _____

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 15MAR2018_537B

Worklist Number: 55402

Instrument Name: A8_N

Chrom Method: 537_A8_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b

QC Batching: Enabled

Limit Group Batching: Enabled

QC Batch: 1	LC 537 CS ICAL Raw Batch: 213296	LC 537 ICAL Raw Batch: 213295
# 1 CCV L3 # 2 RB # 3 MB 320-212344/1-A # 4 LLCS 320-212344/2-A # 5 LLCSD 320-212344/3-A # 6 320-36770-A-1-A # 7 320-36770-A-2-A # 8 320-36770-A-3-A # 9 320-36770-A-3-B LMS #10 320-36770-A-3-C LMSD #11 320-36770-A-4-A #12 CCV L5	# 1 CCV L3 # 2 RB # 3 MB 320-212344/1-A # 4 LLCS 320-212344/2-A # 5 LLCSD 320-212344/3-A # 6 320-36770-A-1-A # 7 320-36770-A-2-A # 8 320-36770-A-3-A # 9 320-36770-A-3-B LMS #10 320-36770-A-3-C LMSD #11 320-36770-A-4-A #12 CCV L5	#12 CCV L5

QC Batch: 2	LC 537 CS ICAL Raw Batch: 213298	LC 537 ICAL Raw Batch: 213297
#12 CCV L5 #13 RB #14 MB 320-212343/1-A #15 LCS 320-212343/2-A #16 320-36794-A-1-A #17 320-36794-A-2-A #18 320-36794-A-3-A #19 320-36794-A-4-A #20 320-36794-A-5-A #21 320-36794-A-6-A #22 CCV L3	#12 CCV L5	#12 CCV L5 #13 RB #14 MB 320-212343/1-A #15 LCS 320-212343/2-A #16 320-36794-A-1-A #17 320-36794-A-2-A #18 320-36794-A-3-A #19 320-36794-A-4-A #20 320-36794-A-5-A #21 320-36794-A-6-A #22 CCV L3

QC Batch: 3	LC 537 ICAL Raw Batch: 213299
#22 CCV L3 #23 RB #24 320-36794-A-7-A #25 320-36794-A-7-B MS #26 320-36794-A-7-C MSD #27 320-36794-A-8-A #28 CCV L5	#22 CCV L3 #23 RB #24 320-36794-A-7-A #25 320-36794-A-7-B MS #26 320-36794-A-7-C MSD #27 320-36794-A-8-A #28 CCV L5

QC Batch: 4	LC 537 ICAL Raw Batch: 213300
#28 CCV L5 #29 RB #30 CARTRIDGE QC 6390138-01 MB #31 CARTRIDGE QC 6390138-01 LCS #32 CARTRIDGE QC 6390138-02 MB #33 CARTRIDGE QC 6390138-02 LCS #34 CCV L3 #35 RB	#28 CCV L5 #29 RB #30 CARTRIDGE QC 6390138-01 MB #31 CARTRIDGE QC 6390138-01 LCS #32 CARTRIDGE QC 6390138-02 MB #33 CARTRIDGE QC 6390138-02 LCS #34 CCV L3 #35 RB

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 15MAR2018_537B

Worklist Num: 55402

Instrument: A8_N

Method: 537_A8_N

Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180316-55402.b

Analysis Type: SemiVOA

Creator: Royce, Amani A

Inj Volume: 2.00

Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCV L3	320-0055402-001	CCVIS	15-Mar-2018 21:33:12	2018.03.15_537AAX_005.d	3	1.0		sv
RB	320-0055402-002	RB	15-Mar-2018 21:37:53	2018.03.15_537AAX_006.d	8	1.0		sv
MB 320-212344/1-A	320-0055402-003	MB	15-Mar-2018 21:42:32	2018.03.15_537AAX_007.d	1	1.0		sv
LLCS 320-212344/2-A	320-0055402-004	LLCS	15-Mar-2018 21:47:15	2018.03.15_537AAX_008.d	2	1.0		sv
LLCSD 320-212344/3-A	320-0055402-005	LLCSD	15-Mar-2018 21:51:56	2018.03.15_537AAX_009.d	3	1.0		sv
320-36770-A-1-A	320-0055402-006	Client	15-Mar-2018 21:56:38	2018.03.15_537AAX_010.d	4	20.0	GC030518-PT	sv
320-36770-A-2-A	320-0055402-007	Client	15-Mar-2018 22:01:18	2018.03.15_537AAX_011.d	5	1.0	GC030518-PV1-LAG	sv
320-36770-A-3-A	320-0055402-008	Client	15-Mar-2018 22:06:00	2018.03.15_537AAX_012.d	6	1.0	GC030518-PV2-LEAD	sv
320-36770-A-3-B LMS	320-0055402-009	LMS	15-Mar-2018 22:10:40	2018.03.15_537AAX_013.d	7	1.0		sv
320-36770-A-3-C LMSD	320-0055402-010	LMSD	15-Mar-2018 22:15:21	2018.03.15_537AAX_014.d	8	1.0		sv
320-36770-A-4-A	320-0055402-011	Client	15-Mar-2018 22:20:02	2018.03.15_537AAX_015.d	9	1.0	FB1-WWKGAC-030518	sv
CCV L5	320-0055402-012	CCVIS	15-Mar-2018 22:24:43	2018.03.15_537AAX_016.d	5	1.0		sv
RB	320-0055402-013	RB	15-Mar-2018 22:29:23	2018.03.15_537AAX_017.d	8	1.0		sv
MB 320-212343/1-A	320-0055402-014	MB	15-Mar-2018 22:34:03	2018.03.15_537AAX_018.d	10	1.0		sv
LCS 320-212343/2-A	320-0055402-015	LCS	15-Mar-2018 22:38:44	2018.03.15_537AAX_019.d	11	1.0		sv
320-36794-A-1-A	320-0055402-016	Client	15-Mar-2018 22:43:26	2018.03.15_537AAX_020.d	12	1.0	NAWC-030518-RW-055	sv
320-36794-A-2-A	320-0055402-017	Client	15-Mar-2018 22:48:07	2018.03.15_537AAX_021.d	13	1.0	NAWC-030518-FRB-055	sv
320-36794-A-3-A	320-0055402-018	Client	15-Mar-2018 22:52:48	2018.03.15_537AAX_022.d	14	1.0	NAWC-030518-RW-124	sv
320-36794-A-4-A	320-0055402-019	Client	15-Mar-2018 22:57:30	2018.03.15_537AAX_023.d	15	1.0	NAWC-030518-FRB-124	sv
320-36794-A-5-A	320-0055402-020	Client	15-Mar-2018 23:02:11	2018.03.15_537AAX_024.d	16	1.0	NAWC-030518-RW-201	sv
320-36794-A-6-A	320-0055402-021	Client	15-Mar-2018 23:06:52	2018.03.15_537AAX_025.d	17	1.0	NAWC-030518-FRB-201	sv
CCV L3	320-0055402-022	CCVIS	15-Mar-2018 23:11:33	2018.03.15_537AAX_026.d	3	1.0		sv
RB	320-0055402-023	RB	15-Mar-2018 23:16:14	2018.03.15_537AAX_027.d	8	1.0		sv
320-36794-A-7-A	320-0055402-024	Client	15-Mar-2018 23:20:52	2018.03.15_537AAX_028.d	18	1.0	NAWC-030518-RW-190	sv
320-36794-A-7-B MS	320-0055402-025	MS	15-Mar-2018 23:25:32	2018.03.15_537AAX_029.d	19	1.0	NAWC-030518-RW-190	sv

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
320-36794-A-7-C MSD	320-0055402-026	MSD	15-Mar-2018 23:30:14	2018.03.15_537AAX_030.d	20	1.0	NAWC-030518-RW-190	sv
320-36794-A-8-A	320-0055402-027	Client	15-Mar-2018 23:34:56	2018.03.15_537AAX_031.d	21	1.0	NAWC-030518-FRB-190	sv
CCV L5	320-0055402-028	CCVIS	15-Mar-2018 23:39:37	2018.03.15_537AAX_032.d	5	1.0		sv
RB	320-0055402-029	RB	15-Mar-2018 23:44:18	2018.03.15_537AAX_033.d	8	1.0		sv
CARTRIDGE QC 6390138-01 MB	320-0055402-030	Client	15-Mar-2018 23:48:57	2018.03.15_537AAX_049.d	33	1.0		sv
CARTRIDGE QC 6390138-01 LCS	320-0055402-031	Client	15-Mar-2018 23:53:40	2018.03.15_537AAX_050.d	34	1.0		sv
CARTRIDGE QC 6390138-02 MB	320-0055402-032	Client	15-Mar-2018 23:58:22	2018.03.15_537AAX_051.d	35	1.0		sv
CARTRIDGE QC 6390138-02 LCS	320-0055402-033	Client	16-Mar-2018 00:03:03	2018.03.15_537AAX_052.d	36	1.0		sv
CCV L3	320-0055402-034	CCVIS	16-Mar-2018 00:07:44	2018.03.15_537AAX_053.d	3	1.0		sv
RB	320-0055402-035	RB	16-Mar-2018 00:12:25	2018.03.15_537AAX_054.d	8	1.0		sv

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-212343 ✓

Analyst: Kouchari, Shamiran

Method Code: 320-537_Prep-320

Batch Open: 3/12/2018 7:09:00AM

Batch End: 3/13/2018 5:30:00PM

Extraction of Perfluorinated Alkyl Acids

Due: 3/27

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Adj1 Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB-320-212343/1 N/A	N/A		250 mL	7		N/A	N/A	Chlorine, ND	
			1.00 mL						
2 LCS-320-212343/2 N/A	N/A		250 mL	7		N/A	N/A	Chlorine, ND RI	
			1.00 mL						
3 320-36794-A-1 (537_DOD5)	N/A (320-36794-1)	286.27 g	256.9 mL	7		3/10/18	16_Days	Chlorine, ND RI	
		29.34 g	1.00 mL						
4 320-36794-A-2 (537_DOD5)	N/A (320-36794-1)	290.19 g	261.3 mL	7		3/10/18	16_Days	Chlorine, ND	
		28.85 g	1.00 mL						
5 320-36794-A-3 (537_DOD5)	N/A (320-36794-1)	276.68 g	247.4 mL	7		3/10/18	16_Days	Chlorine, ND	
		29.33 g	1.00 mL						
6 320-36794-A-4 (537_DOD5)	N/A (320-36794-1)	281.91 g	253.1 mL	7		3/10/18	16_Days	Chlorine, ND	
		28.78 g	1.00 mL						
7 320-36794-A-5 (537_DOD5)	N/A (320-36794-1)	291.25 g	260.2 mL	7		3/10/18	16_Days	Chlorine, ND RI	
		31.05 g	1.00 mL						
8 320-36794-A-6 (537_DOD5)	N/A (320-36794-1)	286.49 g	257.2 mL	7		3/10/18	16_Days	Chlorine, ND RI	
		29.27 g	1.00 mL						
9 320-36794-A-7 (537_DOD5)	N/A (320-36794-1)	291.72 g	260.7 mL	7		3/10/18	16_Days	Chlorine, ND RI	
		31.07 g	1.00 mL						
10 320-36794-A-7-MS (537_DOD5)	N/A (320-36794-1)	288.06 g	258.6 mL	7		3/10/18	16_Days	Chlorine, ND RI	
		29.48 g	1.00 mL						

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-212343

Analyst: Kouchari, Shamiran

Batch Open: 3/12/2018 7:09:00AM

Method Code: 320-537_Prep-320

Batch End: 3/13/2018 5:30:00PM

11	320-36794-A-7-MSD (537_DOD5)	N/A (320-36794-1)	303.07 g	274.1 mL	7		3/10/18	16_Days	4	Chlorine, ND	RI	
			29.02 g	1.00 mL								
12	320-36794-A-8 (537_DOD5)	N/A (320-36794-1)	309.19 g	278.4 mL	7		3/10/18	16_Days	4	Chlorine, ND	RI	
			30.77 g	1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-212343

Analyst: Kouchari, Shamiran

Batch Open: 3/12/2018 7:09:00AM

Method Code: 320-537_Prep-320

Batch End: 3/13/2018 5:30:00PM

Batch Notes

Manifold ID 1

pH Indicator ID 3817

Trizma ID SLBR5241V

SPE Cartridge Lot ID 6369499

Methanol ID 1175203

Reagent Water ID 03/08/18

Internal Standard ID# 1048713

Pipette ID H14930F

Analyst ID - TA Reagent Drop HJA

Analyst ID - TA Reagent Drop KMK

Witness

Analyst ID - SU Reagent Drop HJA

Analyst ID - SU Reagent Drop KMK

Witness

Analyst ID - IS Reagent Drop KMK

Analyst ID - IS Reagent Drop JER

Witness

Analyst ID - Concentration SKD/KMK

Analyst ID - Aliquot Step VPM

Analyst ID - Final Volume Step VPM

Batch Comment Client labels match TA labels, 03/12/18 SKD

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-212343

Analyst: Kouchari, Shamiran

Batch Open: 3/12/2018 7:09:00AM

Method Code: 320-537_Prep-320

Batch End: 3/13/2018 5:30:00PM

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-212343

Analyst: Kouchari, Shamiran

Batch Open: 3/12/2018 7:09:00AM

Method Code: 320-537_Prep-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-212343/1	LC537-SU_00062	100 uL	1.00 mL	HJA 3-12-18	KMK-3-12-18
LCS 320-212343/2	LC537-MSP_00032	100 uL	1.00 mL		
LCS 320-212343/2	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-1	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-2	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-3	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-4	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-5	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-6	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-7	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-7 MS	LC537-MSP_00032	100 uL	1.00 mL		
320-36794-A-7 MS	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-7 MSD	LC537-MSP_00032	100 uL	1.00 mL		
320-36794-A-7 MSD	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-8	LC537-SU_00062	100 uL	1.00 mL		

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-212343

Analyst: Kouchari, Shamiran

Batch Open: 3/12/2018 7:09:00AM

Method Code: 320-537_Prep-320

Batch End:

Other Reagents:

Reagent	Amount/Units	Lot#:

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Sacramento Preparation Data Review Checklist

Preparation Batch Number(s) 212343 Test 537 prep

Earliest Holding Time 3/19/18

Batch Information	1 st Level Reviewer	2 nd Level Reviewer
Date and time accurate and entered into TALS correctly	/	/
All necessary batch information complete and entered into TALS correctly	/	/
BD, FV, and AL initials are transcribed into the batch comment	/	/
Sample List Tab	1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method	/	/
Holding time violation NCM filed	NA	NA
MS/MSD or MS/DU NCM filed	NA	NA
NCM for any anomalies filed	NA	NA
All NCMs include method code, matrix, and prep batch	NA	NA
Method/sample/login/QAS checked and correct	/	/
Batch contains no more than 20 live samples	/	/
Worksheet Tab	1 st Level Reviewer	2 nd Level Reviewer
All samples properly preserved	/	/
Weights in anticipated range and not targeted	/	/
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check)	/	/
The pH is transcribed properly in TALS	/	/
All additional information is transcribed into TALS and is correct and raw data is attached	/	/
Comments/Observations are transcribed correctly in TALS	/	/
Reagents Tab	1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and checked into TALS	/	/
All spike amounts correct and added to necessary samples and QC	/	/
Internal Standard is added to the reagents	/	/
All units are correctly transcribed into TALS	/	/

1st Level Reviewer: Kmk

Date: 3-14-18

2nd Level Reviewer: Vpm

Date: 3-14-18

Comments: _____

Shipping and Receiving Documents

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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☒ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact		Project Manager: Andy Frebowitz		Site Contact: Mary Kay Bond		Date: 3/5/2018		COC No.:	
TetraTech		Tel/Fax: 610.382.1170		Lab Contact: Dave Alltucker		Carrier: FedEx		1 of 1 COCs	
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)		Analysis Turnaround Time ☐ CALENDAR DAYS ☐ WORKING DAYS TAT if different from Below 21 ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Filtered Sample (Y/N) Perform MS / MSD (Y / N) EPA S37 UCMR3				Sampler: Mary Kay Bond For Lab Use Only: Walk-in Client: Lab Sampling: Job / SDG No.:	
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.			Sample Specific Notes:
NAWC-030518-RW-055		3/5/2018	10:10	G	DW	2	N	N	
NAWC-030518-FRB-055		3/5/2018	10:05	G	DW	2	N	N	Field Reagent Blank
NAWC-030518-RW-124		3/5/2018	10:40	G	DW	2	N	Y	
NAWC-030518-FRB-124		3/5/2018	10:35	G	DW	2	N	N	Field Reagent Blank
NAWC-030518-RW-201		3/5/2018	11:10	G	DW	2	N	N	
NAWC-030518-FRB-201		3/5/2018	11:05	G	DW	2	N	N	Field Reagent Blank
NAWC-030518-RW-190		3/5/2018	11:40	G	DW	6	N	Y	MS/MSD
NAWC-030518-FRB-190		3/5/2018	11:35	G	DW	2	N	N	Field Reagent Blank
							 320-36794 Chain of Custody		
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other: Trizma							6		
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the							Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown							☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months		
Fed Ex Tracking: 7717 1384 7126									
Custody Seals Intact: ☐ Yes ☐ No		Custody Seal No.:		Cooler Temp. (°C): Obs'd: 3.9 Corr'd: 3.9		Therm ID No: HK-2 ice			
Relinquished by: [Signature]		Company: Tetra Tech		Date/Time: 3/5/2018 16:00		Received by: [Signature] <i>Mary Kay Bond</i>		Company: WA-SAC	
Relinquished by:		Company:		Date/Time:		Received by:		Company:	
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:		Company:	

Form No. CA-C-WI-002, Rev. 4.11, dated 1/24/2017

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-36794-1

Login Number: 36794

List Number: 1

Creator: Her, David A

List Source: TestAmerica Sacramento

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

"NAWC-030518-RW-055","537","RES","320-36794-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U M","6.6","DL","","TRG","","","39","LOQ","YES","-99","","256.9","1.00","16",""
"NAWC-030518-RW-055","537","RES","320-36794-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","4.3","ng/L","J","2.7","DL","","TRG","","","19","LOQ","YES","-99","","256.9","1.00","7.8",""
"NAWC-030518-RW-055","537","RES","320-36794-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U M","5.4","DL","","TRG","","","29","LOQ","YES","-99","","256.9","1.00","12",""
"NAWC-030518-RW-055","537","RES","320-36794-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U M","16","DL","","TRG","","","88","LOQ","YES","-99","","256.9","1.00","35",""
"NAWC-030518-RW-055","537","RES","320-36794-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.9","ng/L","U","1.8","DL","","TRG","","","9.7","LOQ","YES","-99","","256.9","1.00","3.9",""
"NAWC-030518-RW-055","537","RES","320-36794-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U","7.8","DL","","TRG","","","23","LOQ","YES","-99","","256.9","1.00","19",""
"NAWC-030518-RW-055","537","RES","320-36794-1","TALSAC","STL00993","13C2 PFHxA","37","ng/L","","-99","DL","","SURRE","95","","-99","LOQ","YES","38.9","","256.9","1.00","0",""
"NAWC-030518-RW-055","537","RES","320-36794-1","TALSAC","STL00996","13C2 PFDA","45","ng/L","","-99","DL","","SURRE","117","","-99","LOQ","YES","38.9","","256.9","1.00","0",""
"NAWC-030518-FRB-055","537","RES","320-36794-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","15","ng/L","U","6.5","DL","","TRG","","","38","LOQ","YES","-99","","261.3","1.00","15",""
"NAWC-030518-FRB-055","537","RES","320-36794-2","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.7","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","261.3","1.00","7.7",""
"NAWC-030518-FRB-055","537","RES","320-36794-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","11","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES","-99","","261.3","1.00","11",""
"NAWC-030518-FRB-055","537","RES","320-36794-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","34","ng/L","U","15","DL","","TRG","","","86","LOQ","YES","-99","","261.3","1.00","34",""
"NAWC-030518-FRB-055","537","RES","320-36794-2","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.8","ng/L","U","1.8","DL","","TRG","","","9.6","LOQ","YES","-99","","261.3","1.00","3.8",""
"NAWC-030518-FRB-055","537","RES","320-36794-2","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U","7.7","DL","","TRG","","","23","LOQ","YES","-99","","261.3","1.00","19",""
"NAWC-030518-FRB-055","537","RES","320-36794-2","TALSAC","STL00993","13C2 PFHxA","36","ng/L","","-99","DL","","SURRE","93","","-99","LOQ","YES","38.3","","261.3","1.00","0",""
"NAWC-030518-FRB-055","537","RES","320-36794-2","TALSAC","STL00996","13C2 PFDA","39","ng/L","","-99","DL","","SURRE","101","","-99","LOQ","YES","38.3","","261.3","1.00","0",""
"NAWC-030518-RW-124","537","RES","320-36794-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","34","ng/L","J M","6.9","DL","","TRG","","","40","LOQ","YES","-99","","247.4","1.00","16",""
"NAWC-030518-RW-124","537","RES","320-36794-3","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","30","ng/L","","2.8","DL","","TRG","","","20","LOQ","YES","-99","","247.4","1.00","8.1",""
"NAWC-030518-RW-124","537","RES","320-36794-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","17","ng/L","J","5.6","DL","","TRG","","","30","LOQ","YES","-99","","247.4","1.00","12",""
"NAWC-030518-RW-124","537","RES","320-36794-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","91","LOQ","YES","-99","","247.4","1.00","36",""
"NAWC-030518-RW-124","537","RES","320-36794-3","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","6.0","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","247.4","1.00","4.0",""
"NAWC-030518-RW-124","537","RES","320-36794-3","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","8.1","DL","","TRG","","","24","LOQ","YES","-99","","247.4","1.00","20",""
"NAWC-030518-RW-124","537","RES","320-36794-3","TALSAC","STL00993","13C2 PFHxA","38","ng/L","","-99","DL","","SURRE","94","","-99","LOQ","YES","40.4","","247.4","1.00","0",""
"NAWC-030518-RW-124","537","RES","320-36794-3","TALSAC","STL00996","13C2 PFDA","45","ng/L","","-99","DL","","SURRE","110","","-99","LOQ","YES","40.4","","247.4","1.00","0",""
"NAWC-030518-FRB-124","537","RES","320-36794-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.7","DL","","TRG","","","40","LOQ","YES","-99","","253.1","1.00","16",""
"NAWC-030518-FRB-124","537","RES","320-36794-4","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.9","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","253.1","1.00","7.9",""
"NAWC-030518-FRB-124","537","RES","320-36794-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS),"12","ng/L","U","5.4","DL","","TRG","","","30","LOQ","YES",-99","","253.1","1.00","12","","
"NAWC-030518-FRB-124","537","RES","320-36794-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"36","ng/L","U","16","DL","","TRG","","","89","LOQ","YES",-99","","253.1","1.00","36","","
"NAWC-030518-FRB-124","537","RES","320-36794-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"4.0","ng/L","U","1.9","DL","","TRG","","","9.9","LOQ","YES",-99","","253.1","1.00","4.0","","
"NAWC-030518-FRB-124","537","RES","320-36794-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"20","ng/L","U","7.9","DL","","TRG","","","24","LOQ","YES",-99","","253.1","1.00","20","","
"NAWC-030518-FRB-124","537","RES","320-36794-4","TALSAC","STL00993","13C2
PFHxA),"41","ng/L","","-99","DL","","SURRE","104","","-99","LOQ","YES","39.5","","253.1","1.00","0","","
"NAWC-030518-FRB-124","537","RES","320-36794-4","TALSAC","STL00996","13C2
PFDA),"44","ng/L","","-99","DL","","SURRE","111","","-99","LOQ","YES","39.5","","253.1","1.00","0","","
"NAWC-030518-RW-201","537","RES","320-36794-5","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"9.8","ng/L","J M","6.5","DL","","TRG","","","38","LOQ","YES",-99","","260.2","1.00","15","","
"NAWC-030518-RW-201","537","RES","320-36794-5","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"14","ng/L","J","2.7","DL","","TRG","","","19","LOQ","YES",-99","","260.2","1.00","7.7","","
"NAWC-030518-RW-201","537","RES","320-36794-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"12","ng/L","U M","5.3","DL","","TRG","","","29","LOQ","YES",-99","","260.2","1.00","12","","
"NAWC-030518-RW-201","537","RES","320-36794-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"35","ng/L","U M","15","DL","","TRG","","","86","LOQ","YES",-99","","260.2","1.00","35","","
"NAWC-030518-RW-201","537","RES","320-36794-5","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"4.3","ng/L","J","1.8","DL","","TRG","","","9.6","LOQ","YES",-99","","260.2","1.00","3.8","","
"NAWC-030518-RW-201","537","RES","320-36794-5","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"19","ng/L","U","7.7","DL","","TRG","","","23","LOQ","YES",-99","","260.2","1.00","19","","
"NAWC-030518-RW-201","537","RES","320-36794-5","TALSAC","STL00993","13C2
PFHxA),"35","ng/L","","-99","DL","","SURRE","90","","-99","LOQ","YES","38.4","","260.2","1.00","0","","
"NAWC-030518-RW-201","537","RES","320-36794-5","TALSAC","STL00996","13C2
PFDA),"43","ng/L","","-99","DL","","SURRE","112","","-99","LOQ","YES","38.4","","260.2","1.00","0","","
"NAWC-030518-FRB-201","537","RES","320-36794-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"16","ng/L","U","6.6","DL","","TRG","","","39","LOQ","YES",-99","","257.2","1.00","16","","
"NAWC-030518-FRB-201","537","RES","320-36794-6","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"7.8","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES",-99","","257.2","1.00","7.8","","
"NAWC-030518-FRB-201","537","RES","320-36794-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"12","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES",-99","","257.2","1.00","12","","
"NAWC-030518-FRB-201","537","RES","320-36794-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"35","ng/L","U","16","DL","","TRG","","","87","LOQ","YES",-99","","257.2","1.00","35","","
"NAWC-030518-FRB-201","537","RES","320-36794-6","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"3.9","ng/L","U","1.8","DL","","TRG","","","9.7","LOQ","YES",-99","","257.2","1.00","3.9","","
"NAWC-030518-FRB-201","537","RES","320-36794-6","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"19","ng/L","U","7.8","DL","","TRG","","","23","LOQ","YES",-99","","257.2","1.00","19","","
"NAWC-030518-FRB-201","537","RES","320-36794-6","TALSAC","STL00993","13C2
PFHxA),"40","ng/L","","-99","DL","","SURRE","103","","-99","LOQ","YES","38.9","","257.2","1.00","0","","
"NAWC-030518-FRB-201","537","RES","320-36794-6","TALSAC","STL00996","13C2
PFDA),"44","ng/L","","-99","DL","","SURRE","112","","-99","LOQ","YES","38.9","","257.2","1.00","0","","
"NAWC-030518-RW-190","537","RES","320-36794-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"11","ng/L","J M","6.5","DL","","TRG","","","38","LOQ","YES",-99","","260.7","1.00","15","","
"NAWC-030518-RW-190","537","RES","320-36794-7","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"12","ng/L","J M","2.7","DL","","TRG","","","19","LOQ","YES",-99","","260.7","1.00","7.7","","
"NAWC-030518-RW-190","537","RES","320-36794-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"12","ng/L","U M","5.3","DL","","TRG","","","29","LOQ","YES",-99","","260.7","1.00","12","","
"NAWC-030518-RW-190","537","RES","320-36794-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"35","ng/L","U","15","DL","","TRG","","","86","LOQ","YES",-99","","260.7","1.00","35","","
"NAWC-030518-RW-190","537","RES","320-36794-7","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"3.5","ng/L","J","1.8","DL","","TRG","","","9.6","LOQ","YES",-99","","260.7","1.00","3.8","","
"NAWC-030518-RW-190","537","RES","320-36794-7","TALSAC","375-95-1","Perfluorononanoic acid

(PFNA)","19","ng/L","U","7.7","DL","","","TRG","","","23","LOQ","YES","-99","","","260.7","1.00","19","","
"NAWC-030518-RW-190","537","RES","320-36794-7","TALSAC","STL00993","13C2
PFHxA","37","ng/L","","","-99","DL","","","SURRE","97","","","-99","LOQ","YES","38.4","","","260.7","1.00","0","","
"NAWC-030518-RW-190","537","RES","320-36794-7","TALSAC","STL00996","13C2
PFDA","43","ng/L","","","-99","DL","","","SURRE","112","","","-99","LOQ","YES","38.4","","","260.7","1.00","0","","
"NAWC-030518-RW-190MS","537","RES","320-36794-7MS","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","153","ng/L","M","6.6","DL","","","SPK","110","","","39","LOQ","YES","129","NAWC-030518-RW-
190","258.6","1.00","15","","
"NAWC-030518-RW-190MS","537","RES","320-36794-7MS","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","83.0","ng/L","","","2.7","DL","","","SPK","110","","","19","LOQ","YES","64.8","NAWC-030518-RW-
190","258.6","1.00","7.7","","
"NAWC-030518-RW-190MS","537","RES","320-36794-7MS","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","104","ng/L","M","5.3","DL","","","SPK","107","","","29","LOQ","YES","96.7","NAWC-030518-RW-
190","258.6","1.00","12","","
"NAWC-030518-RW-190MS","537","RES","320-36794-7MS","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","248","ng/L","","","16","DL","","","SPK","85","","","87","LOQ","YES","290","NAWC-030518-RW-
190","258.6","1.00","35","","
"NAWC-030518-RW-190MS","537","RES","320-36794-7MS","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","38.8","ng/L","","","1.8","DL","","","SPK","110","","","9.7","LOQ","YES","32.2","NAWC-030518-RW-
190","258.6","1.00","3.9","","
"NAWC-030518-RW-190MS","537","RES","320-36794-7MS","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","72.7","ng/L","","","7.7","DL","","","SPK","113","","","23","LOQ","YES","64.5","NAWC-030518-RW-
190","258.6","1.00","19","","
"NAWC-030518-RW-190MS","537","RES","320-36794-7MS","TALSAC","STL00993","13C2
PFHxA","33.5","ng/L","","","-99","DL","","","SURRE","87","","","-99","LOQ","YES","38.7","NAWC-030518-RW-
190","258.6","1.00","0","","
"NAWC-030518-RW-190MS","537","RES","320-36794-7MS","TALSAC","STL00996","13C2
PFDA","43.3","ng/L","","","-99","DL","","","SURRE","112","","","-99","LOQ","YES","38.7","NAWC-030518-RW-
190","258.6","1.00","0","","
"NAWC-030518-RW-190MSD","537","RES","320-36794-7MSD","TALSAC","1763-23-1","Perfluorooctanesulfonic
acid (PFOS)","147","ng/L","M","6.2","DL","","","SPK","111","4","36","LOQ","YES","122","NAWC-030518-RW-
190","274.1","1.00","15","","
"NAWC-030518-RW-190MSD","537","RES","320-36794-7MSD","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","77.3","ng/L","","","2.6","DL","","","SPK","107","7","18","LOQ","YES","61.1","NAWC-030518-RW-
190","274.1","1.00","7.3","","
"NAWC-030518-RW-190MSD","537","RES","320-36794-7MSD","TALSAC","355-46-4","Perfluorohexanesulfonic
acid (PFHxS)","105","ng/L","","","5.0","DL","","","SPK","115","1","27","LOQ","YES","91.2","NAWC-030518-RW-
190","274.1","1.00","11","","
"NAWC-030518-RW-190MSD","537","RES","320-36794-7MSD","TALSAC","375-73-5","Perfluorobutanesulfonic
acid (PFBS)","283","ng/L","","","15","DL","","","SPK","103","13","82","LOQ","YES","274","NAWC-030518-RW-
190","274.1","1.00","33","","
"NAWC-030518-RW-190MSD","537","RES","320-36794-7MSD","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","35.7","ng/L","","","1.7","DL","","","SPK","106","8","9.1","LOQ","YES","30.4","NAWC-030518-RW-
190","274.1","1.00","3.6","","
"NAWC-030518-RW-190MSD","537","RES","320-36794-7MSD","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","66.3","ng/L","","","7.3","DL","","","SPK","109","9","22","LOQ","YES","60.8","NAWC-030518-RW-
190","274.1","1.00","18","","
"NAWC-030518-RW-190MSD","537","RES","320-36794-7MSD","TALSAC","STL00993","13C2
PFHxA","34.7","ng/L","","","-99","DL","","","SURRE","95","","","-99","LOQ","YES","36.5","NAWC-030518-RW-
190","274.1","1.00","0","","
"NAWC-030518-RW-190MSD","537","RES","320-36794-7MSD","TALSAC","STL00996","13C2
PFDA","38.9","ng/L","","","-99","DL","","","SURRE","107","","","-99","LOQ","YES","36.5","NAWC-030518-RW-
190","274.1","1.00","0","","
"NAWC-030518-FRB-190","537","RES","320-36794-8","TALSAC","1763-23-1","Perfluorooctanesulfonic acid

(PFOS),"14","ng/L","U","6.1","DL","","","TRG","","","36","LOQ","YES",-99","","278.4","1.00","14","","
"NAWC-030518-FRB-190","537","RES","320-36794-8","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"7.2","ng/L","U","2.5","DL","","","TRG","","","18","LOQ","YES",-99","","278.4","1.00","7.2","","
"NAWC-030518-FRB-190","537","RES","320-36794-8","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"11","ng/L","U","4.9","DL","","","TRG","","","27","LOQ","YES",-99","","278.4","1.00","11","","
"NAWC-030518-FRB-190","537","RES","320-36794-8","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"32","ng/L","U","14","DL","","","TRG","","","81","LOQ","YES",-99","","278.4","1.00","32","","
"NAWC-030518-FRB-190","537","RES","320-36794-8","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"3.6","ng/L","U","1.7","DL","","","TRG","","","9.0","LOQ","YES",-99","","278.4","1.00","3.6","","
"NAWC-030518-FRB-190","537","RES","320-36794-8","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"18","ng/L","U","7.2","DL","","","TRG","","","22","LOQ","YES",-99","","278.4","1.00","18","","
"NAWC-030518-FRB-190","537","RES","320-36794-8","TALSAC","STL00993","13C2
PFHxA","36","ng/L","","","-99","DL","","","SURR","101","","","-99","LOQ","YES","35.9","","278.4","1.00","0","","
"NAWC-030518-FRB-190","537","RES","320-36794-8","TALSAC","STL00996","13C2
PFDA","42","ng/L","","","-99","DL","","","SURR","116","","","-99","LOQ","YES","35.9","","278.4","1.00","0","","
"LCS 320-212343/2-A","537","RES","LCS 320-212343/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"149","ng/L","M","6.8","DL","","","SPK","111","","","40","LOQ","YES","134","","250","1.00","16","","
"LCS 320-212343/2-A","537","RES","LCS 320-212343/2-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"71.9","ng/L","","","2.8","DL","","","SPK","107","","","20","LOQ","YES","67.0","","250","1.00","8.0","","
"LCS 320-212343/2-A","537","RES","LCS 320-212343/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"114","ng/L","","","5.5","DL","","","SPK","114","","","30","LOQ","YES","100","","250","1.00","12","","
"LCS 320-212343/2-A","537","RES","LCS 320-212343/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"271","ng/L","","","16","DL","","","SPK","90","","","90","LOQ","YES","300","","250","1.00","36","","
"LCS 320-212343/2-A","537","RES","LCS 320-212343/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"35.2","ng/L","","","1.9","DL","","","SPK","105","","","10","LOQ","YES","33.3","","250","1.00","4.0","","
"LCS 320-212343/2-A","537","RES","LCS 320-212343/2-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"68.7","ng/L","","","8.0","DL","","","SPK","103","","","24","LOQ","YES","66.7","","250","1.00","20","","
"LCS 320-212343/2-A","537","RES","LCS 320-212343/2-A","TALSAC","STL00993","13C2
PFHxA","36.5","ng/L","","","-99","DL","","","SURR","91","","","-99","LOQ","YES","40.0","","250","1.00","0","","
"LCS 320-212343/2-A","537","RES","LCS 320-212343/2-A","TALSAC","STL00996","13C2
PFDA","43.5","ng/L","","","-99","DL","","","SURR","109","","","-99","LOQ","YES","40.0","","250","1.00","0","","
"MB 320-212343/1-A","537","RES","MB 320-212343/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"16","ng/L","U","6.8","DL","","","TRG","","","40","LOQ","YES",-99","","250","1.00","16","","
"MB 320-212343/1-A","537","RES","MB 320-212343/1-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"8.0","ng/L","U","2.8","DL","","","TRG","","","20","LOQ","YES",-99","","250","1.00","8.0","","
"MB 320-212343/1-A","537","RES","MB 320-212343/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"12","ng/L","U","5.5","DL","","","TRG","","","30","LOQ","YES",-99","","250","1.00","12","","
"MB 320-212343/1-A","537","RES","MB 320-212343/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"36","ng/L","U","16","DL","","","TRG","","","90","LOQ","YES",-99","","250","1.00","36","","
"MB 320-212343/1-A","537","RES","MB 320-212343/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"4.0","ng/L","U","1.9","DL","","","TRG","","","10","LOQ","YES",-99","","250","1.00","4.0","","
"MB 320-212343/1-A","537","RES","MB 320-212343/1-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"20","ng/L","U","8.0","DL","","","TRG","","","24","LOQ","YES",-99","","250","1.00","20","","
"MB 320-212343/1-A","537","RES","MB 320-212343/1-A","TALSAC","STL00993","13C2
PFHxA","40.9","ng/L","","","-99","DL","","","SURR","102","","","-99","LOQ","YES","40.0","","250","1.00","0","","
"MB 320-212343/1-A","537","RES","MB 320-212343/1-A","TALSAC","STL00996","13C2
PFDA","43.4","ng/L","","","-99","DL","","","SURR","108","","","-99","LOQ","YES","40.0","","250","1.00","0","","
"Unknown","Unknown","NAWC-030518-RW-055","03/05/2018 10:10","AQ","320-36794-
1","NM","","","3.90","537","METHOD","RES","03/12/2018 07:09","03/15/2018
22:43","TALSAC","COA","WET","NA","1","NA","NA","","","100","320-212343","320-212343","NA","320-
213297","320-36794-1","03/06/2018 09:40","03/07/2018 08:20","","
"Unknown","Unknown","NAWC-030518-FRB-055","03/05/2018 10:05","AQ","320-36794-
2","FB","","","3.90","537","METHOD","RES","03/12/2018 07:09","03/15/2018
22:48","TALSAC","COA","WET","NA","1","NA","NA","","","100","320-212343","320-212343","NA","320-

213297","320-36794-1","03/06/2018 09:40","03/07/2018 08:20",""
"Unknown","Unknown","NAWC-030518-RW-124","03/05/2018 10:40","AQ","320-36794-
3","NM","","3.90","537","METHOD","RES","03/12/2018 07:09","03/15/2018
22:52","TALSAC","COA","WET","NA","1","NA","NA","","100","320-212343","320-212343","NA","320-
213297","320-36794-1","03/06/2018 09:40","03/07/2018 08:20",""
"Unknown","Unknown","NAWC-030518-FRB-124","03/05/2018 10:35","AQ","320-36794-
4","FB","","3.90","537","METHOD","RES","03/12/2018 07:09","03/15/2018
22:57","TALSAC","COA","WET","NA","1","NA","NA","","100","320-212343","320-212343","NA","320-
213297","320-36794-1","03/06/2018 09:40","03/07/2018 08:20",""
"Unknown","Unknown","NAWC-030518-RW-201","03/05/2018 11:10","AQ","320-36794-
5","NM","","3.90","537","METHOD","RES","03/12/2018 07:09","03/15/2018
23:02","TALSAC","COA","WET","NA","1","NA","NA","","100","320-212343","320-212343","NA","320-
213297","320-36794-1","03/06/2018 09:40","03/07/2018 08:20",""
"Unknown","Unknown","NAWC-030518-FRB-201","03/05/2018 11:05","AQ","320-36794-
6","FB","","3.90","537","METHOD","RES","03/12/2018 07:09","03/15/2018
23:06","TALSAC","COA","WET","NA","1","NA","NA","","100","320-212343","320-212343","NA","320-
213297","320-36794-1","03/06/2018 09:40","03/07/2018 08:20",""
"Unknown","Unknown","NAWC-030518-RW-190","03/05/2018 11:40","AQ","320-36794-
7","NM","","3.90","537","METHOD","RES","03/12/2018 07:09","03/15/2018
23:20","TALSAC","COA","WET","NA","1","NA","NA","","100","320-212343","320-212343","NA","320-
213299","320-36794-1","03/06/2018 09:40","03/07/2018 08:20",""
"Unknown","Unknown","NAWC-030518-RW-190MS","03/05/2018 11:40","AQ","320-36794-
7MS","MS","","3.90","537","METHOD","RES","03/12/2018 07:09","03/15/2018
23:25","TALSAC","COA","WET","NA","1","NA","NA","","100","320-212343","320-212343","NA","320-
213299","320-36794-1","03/06/2018 09:40","03/07/2018 08:20",""
"Unknown","Unknown","NAWC-030518-RW-190MSD","03/05/2018 11:40","AQ","320-36794-
7MSD","MSD","","3.90","537","METHOD","RES","03/12/2018 07:09","03/15/2018
23:30","TALSAC","COA","WET","NA","1","NA","NA","","100","320-212343","320-212343","NA","320-
213299","320-36794-1","03/06/2018 09:40","03/07/2018 08:20",""
"Unknown","Unknown","NAWC-030518-FRB-190","03/05/2018 11:35","AQ","320-36794-
8","FB","","3.90","537","METHOD","RES","03/12/2018 07:09","03/15/2018
23:34","TALSAC","COA","WET","NA","1","NA","NA","","100","320-212343","320-212343","NA","320-
213299","320-36794-1","03/06/2018 09:40","03/07/2018 08:20",""
"Unknown","Unknown","LCS 320-212343/2-A","","AQ","LCS 320-212343/2-
A","LCS","","-99","537","METHOD","RES","03/12/2018 07:09","03/15/2018
22:38","TALSAC","COA","WET","NA","1","NA","NA","","100","320-212343","320-212343","NA","320-
213297","320-36794-1","03/12/2018 07:09","03/07/2018 08:20",""
"Unknown","Unknown","MB 320-212343/1-A","","AQ","MB 320-212343/1-
A","MB","","-99","537","METHOD","RES","03/12/2018 07:09","03/15/2018
22:34","TALSAC","COA","WET","NA","1","NA","NA","","100","320-212343","320-212343","NA","320-
213297","320-36794-1","03/12/2018 07:09","03/07/2018 08:20",""



TETRA TECH

INTERNAL CORRESPONDENCE

TO: A. FREBOWITZ **DATE:** APRIL 13, 2018
FROM: MEGAN RITCHIE **COPIES:** DV FILE
SUBJECT: ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)
NAS JRB WILLOW GROVE
SAMPLE DELIVERY GROUP (SDG) 320-36794-1

SAMPLES: 4/Field Reagent Blank (FRB)
NAWC-030518-FRB-055 NAWC-030518-FRB-201
NAWC-030518-FRB-124 NAWC-030518-FRB-190

4/Drinking Water
NAWC-030518-RW-055 NAWC-030518-RW-201
NAWC-030518-RW-124 NAWC-030518-RW-190

Overview

The sample set for NAS JRB Willow Grove, SDG 320-36794-1, consisted of four (4) drinking water samples and four (4) FRB samples. All samples were analyzed for select perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA) and perfluorooctane sulfonic acid (PFOS). No field duplicate sample pairs were included in this SDG.

The samples were collected by Tetra Tech on March 5, 2018 and analyzed by Test America-Sacramento. All sample analyses were conducted in accordance with EPA Method 537 version 1.1 analytical and reporting protocols.

The data contained in this SDG was validated regarding the following parameters: data completeness, holding times, initial/continuing calibrations, laboratory method/FRBs, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate results, internal standard areas and recoveries, chromatographic resolution, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

Major

None.

Minor

Detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated, (J).

TO: A. FREBOWITZ
SDG: 320-36794-1

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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-030518-RW-055	NAWC-030518-FRB-055
NAWC-030518-RW-124	NAWC-030518-FRB-124
NAWC-030518-RW-190	NAWC-030518-FRB-190
NAWC-030518-RW-201	NAWC-030518-FRB-201

Non-detected results were reported to the Limit of Detection (LOD).

The buffering agent Trizma was added to all drinking water samples.

Executive Summary

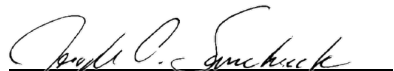
Laboratory Performance: No issues.

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.
Megan Ritchie
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

Appendix A

Qualified Analytical Results

PROJ_NO: 08005-WE04 SDG: 320-36794-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	NAWC-030518-FRB-055			NAWC-030518-FRB-124			NAWC-030518-FRB-190			NAWC-030518-FRB-201		
	LAB_ID	320-36794-2			320-36794-4			320-36794-8			320-36794-6		
	SAMP_DATE	3/5/2018			3/5/2018			3/5/2018			3/5/2018		
	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		7.7	U		7.9	U		7.2	U		7.8	U	
PERFLUOROBUTANESULFONIC ACID		34	U		36	U		32	U		35	U	
PERFLUOROHEPTANOIC ACID		3.8	U		4	U		3.6	U		3.9	U	
PERFLUOROHEXANESULFONIC ACID		11	U		12	U		11	U		12	U	
PERFLUORONONANOIC ACID		19	U		20	U		18	U		19	U	
PERFLUOROOCTANE SULFONIC ACID		15	U		16	U		14	U		16	U	

PROJ_NO: 08005-WE04 SDG: 320-36794-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	NAWC-030518-RW-055			NAWC-030518-RW-124			NAWC-030518-RW-190			NAWC-030518-RW-201		
	LAB_ID	320-36794-1			320-36794-3			320-36794-7			320-36794-5		
	SAMP_DATE	3/5/2018			3/5/2018			3/5/2018			3/5/2018		
	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		4.3	J	P	30			12	J	P	14	J	P
PERFLUOROBUTANESULFONIC ACID		35	U		36	U		35	U		35	U	
PERFLUOROHEPTANOIC ACID		3.9	U		6	J	P	3.5	J	P	4.3	J	P
PERFLUOROHEXANESULFONIC ACID		12	U		17	J	P	12	U		12	U	
PERFLUORONONANOIC ACID		19	U		20	U		19	U		19	U	
PERFLUOROOCTANE SULFONIC ACID		16	U		34	J	P	11	J	P	9.8	J	P

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.

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 ($< 2 \times \text{IDL}$ for inorganics and $< \text{CRQL}$ 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

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-RW-055</u>	Lab Sample ID: <u>320-36794-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_020.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 10:10</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>256.9(mL)</u>	Date Analyzed: <u>03/15/2018 22:43</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213297</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U M	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	4.3	J	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U M	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U M	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	117		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-FRB-055</u>	Lab Sample ID: <u>320-36794-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_021.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 10:05</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>261.3 (mL)</u>	Date Analyzed: <u>03/15/2018 22:48</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213297</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	29	11	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	86	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	101		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-RW-124</u>	Lab Sample ID: <u>320-36794-3</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_022.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 10:40</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>247.4 (mL)</u>	Date Analyzed: <u>03/15/2018 22:52</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213297</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	34	J M	40	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	30		20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	17	J	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.0	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	94		70-130
STL00996	13C2 PFDA	110		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-FRB-124</u>	Lab Sample ID: <u>320-36794-4</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_023.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 10:35</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>253.1 (mL)</u>	Date Analyzed: <u>03/15/2018 22:57</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213297</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	104		70-130
STL00996	13C2 PFDA	111		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-RW-201</u>	Lab Sample ID: <u>320-36794-5</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_024.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 11:10</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>260.2 (mL)</u>	Date Analyzed: <u>03/15/2018 23:02</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213297</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.8	J M	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	14	J	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U M	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.3	J	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U M	86	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	112		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-FRB-201</u>	Lab Sample ID: <u>320-36794-6</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_025.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 11:05</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>257.2 (mL)</u>	Date Analyzed: <u>03/15/2018 23:06</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213297</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.8	U	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		70-130
STL00996	13C2 PFDA	112		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-RW-190</u>	Lab Sample ID: <u>320-36794-7</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_028.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 11:40</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>260.7(mL)</u>	Date Analyzed: <u>03/15/2018 23:20</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213299</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	11	J M	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	12	J M	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U M	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.5	J	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	86	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	112		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-36794-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-030518-FRB-190</u>	Lab Sample ID: <u>320-36794-8</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.03.15_537AAX_031.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>03/05/2018 11:35</u>
Extraction Method: <u>537</u>	Date Extracted: <u>03/12/2018 07:09</u>
Sample wt/vol: <u>278.4 (mL)</u>	Date Analyzed: <u>03/15/2018 23:34</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>213299</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	36	14	6.1
335-67-1	Perfluorooctanoic acid (PFOA)	7.2	U	18	7.2	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	27	11	4.9
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.6	U	9.0	3.6	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	81	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	116		70-130

Appendix C

Support Documentation

TestAmerica Sacramento

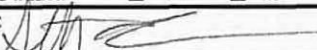
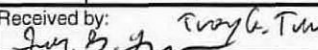
880 Riverside Parkway
West Sacramento, CA 95605-1500
phone 916.373.5600 fax 303.467.7248

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact		Project Manager: Andy Frebowitz		Site Contact: Mary Kay Bond		Date: 3/5/2018		COC No:	
TetraTech		Tel/Fax: 610.382.1170		Lab Contact: Dave Alltucker		Carrier: FedEx		1 of 1 COCs	
234 Mall Boulevard Suite 260		Analysis Turnaround Time		Filtered Sample (Y/N) Perform MS / MSD (Y/N) EPA 537 UCMR3				Sampler: Mary Kay Bond	
King of Prussia, PA 19406		☐ CALENDAR DAYS ☐ WORKING DAYS						For Lab Use Only:	
610-382-1174		TAT if different from Below 21						Walk-in Client:	
610-491-9688		☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day						Lab Sampling:	
Project Name: WE04								Job / SDG No.:	
Site: WE04									
P O # 1132358 (through EarthToxics)									
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.			Sample Specific Notes:
NAWC-030518-RW-055	3/5/2018	10:10	G	DW	2	N N Y			
NAWC-030518-FRB-055	3/5/2018	10:05	G	DW	2	N N Y			Field Reagent Blank
NAWC-030518-RW-124	3/5/2018	10:40	G	DW	2	N Y Y			
NAWC-030518-FRB-124	3/5/2018	10:35	G	DW	2	N N Y			Field Reagent Blank
NAWC-030518-RW-201	3/5/2018	11:10	G	DW	2	N N Y			
NAWC-030518-FRB-201	3/5/2018	11:05	G	DW	2	N N Y			Field Reagent Blank
NAWC-030518-RW-190	3/5/2018	11:40	G	DW	6	N Y Y			MS/MSD
NAWC-030518-FRB-190	3/5/2018	11:35	G	DW	2	N N Y			Field Reagent Blank
							 320-36794 Chain of Custody		
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other: Trizma							6		
Possible Hazard Identification:							Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		
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							☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months		
Fed Ex Tracking: 7717 1384 7126									
Custody Seals Intact: ☐ Yes ☐ No		Custody Seal No.:		Cooler Temp. (°C): Obs'd: 3.9 Corr'd: 3.9		Therm ID No.: #K-2 ice			
Relinquished by: 		Company: Tetra Tech		Date/Time: 3/5/2018 16:00		Received by: 		Company: TA-SAC	
Relinquished by:		Company:		Date/Time:		Received by:		Date/Time:	
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:		Date/Time:	

Form No. CA-C-WI-002, Rev. 4.11, dated 1/24/2017

Job Narrative
320-36794-1

Receipt

The samples were received on 3/6/2018 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.9° 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.

NAS JRB WG PFAS
SDG 320-36794-1

SAMPLE IDENTIFICATION

NAWC-030518-RW-0190

COMPOUND

Perfluorooctane sulfonic acid (PFOS)

COMPOUND AREA	298874
INTERNAL STANDARD AMOUNT (ng/ml)	28.7
DILUTION FACTOR	1
INTERNAL STANDARD AREA	3172593
AVERAGE RRF	0.9474
SAMPLE VOLUME (ml)	260.7
VOLUME EXTRACT (ml)	1
VOLUME INJECTED (μl)	2
ml to L	1000
CONCENTRATION =	10.95 μg/L

$298874 \times 28.7 \text{ ng/ml} \times 1000 \text{ ml} \times 1 / (3172593 \times 0.9474 \times 260.7 \text{ ml} \times 1 \text{ L})$

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Matrix: Water Level: Low
 GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-030518-RW-055	320-36794-1	95	117
NAWC-030518-FRB-055	320-36794-2	93	101
NAWC-030518-RW-124	320-36794-3	94	110
NAWC-030518-FRB-124	320-36794-4	104	111
NAWC-030518-RW-201	320-36794-5	90	112
NAWC-030518-FRB-201	320-36794-6	103	112
NAWC-030518-RW-190	320-36794-7	97	112
NAWC-030518-FRB-190	320-36794-8	101	116
	MB 320-212343/1-A	102	108
	LCS 320-212343/2-A	91	109
NAWC-030518-RW-190 MS	320-36794-7 MS	87	112
NAWC-030518-RW-190 MSD	320-36794-7 MSD	95	107

PFHxA = 13C2 PFHxA
 PFDA = 13C2 PFDA

QC LIMITS
 70-130
 70-130

Column to be used to flag recovery values

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.03.15_537AAX_019.d
 Lab ID: LCS 320-212343/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	134	149	111	70-130	M
Perfluorooctanoic acid (PFOA)	67.0	71.9	107	70-130	
Perfluorononanoic acid (PFNA)	66.7	68.7	103	70-130	
Perfluorohexanesulfonic acid (PFHxS)	100	114	114	70-130	
Perfluoroheptanoic acid (PFHpA)	33.3	35.2	105	70-130	
Perfluorobutanesulfonic acid (PFBS)	300	271	90	70-130	

Column to be used to flag recovery and RPD values

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.03.15_537AAX_029.d
 Lab ID: 320-36794-7 MS Client ID: NAWC-030518-RW-190 MS

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	129	11 J	153	110	70-130	M
Perfluorooctanoic acid (PFOA)	64.8	12 J	83.0	110	70-130	
Perfluorononanoic acid (PFNA)	64.5	19 U	72.7	113	70-130	
Perfluorohexanesulfonic acid (PFHxS)	96.7	12 U	104	107	70-130	M
Perfluoroheptanoic acid (PFHpA)	32.2	3.5 J	38.8	110	70-130	
Perfluorobutanesulfonic acid (PFBS)	290	35 U	248	85	70-130	

Column to be used to flag recovery and RPD values

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.03.15_537AAX_030.d
 Lab ID: 320-36794-7 MSD Client ID: NAWC-030518-RW-190 MSD

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	122	147	111	4	30	70-130	M
Perfluorooctanoic acid (PFOA)	61.1	77.3	107	7	30	70-130	
Perfluorononanoic acid (PFNA)	60.8	66.3	109	9	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	91.2	105	115	1	30	70-130	
Perfluoroheptanoic acid (PFHpA)	30.4	35.7	106	8	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	274	283	103	13	30	70-130	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Lab File ID: 2018.03.15_537AAX_018.d Lab Sample ID: MB 320-212343/1-A
 Matrix: Water Date Extracted: 03/12/2018 07:09
 Instrument ID: A8_N Date Analyzed: 03/15/2018 22:34
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-212343/2-A	2018.03.15_537AAX_019.d	03/15/2018 22:38
NAWC-030518-RW-055	320-36794-1	2018.03.15_537AAX_020.d	03/15/2018 22:43
NAWC-030518-FRB-055	320-36794-2	2018.03.15_537AAX_021.d	03/15/2018 22:48
NAWC-030518-RW-124	320-36794-3	2018.03.15_537AAX_022.d	03/15/2018 22:52
NAWC-030518-FRB-124	320-36794-4	2018.03.15_537AAX_023.d	03/15/2018 22:57
NAWC-030518-RW-201	320-36794-5	2018.03.15_537AAX_024.d	03/15/2018 23:02
NAWC-030518-FRB-201	320-36794-6	2018.03.15_537AAX_025.d	03/15/2018 23:06
NAWC-030518-RW-190	320-36794-7	2018.03.15_537AAX_028.d	03/15/2018 23:20
NAWC-030518-RW-190 MS	320-36794-7 MS	2018.03.15_537AAX_029.d	03/15/2018 23:25
NAWC-030518-RW-190 MSD	320-36794-7 MSD	2018.03.15_537AAX_030.d	03/15/2018 23:30
NAWC-030518-FRB-190	320-36794-8	2018.03.15_537AAX_031.d	03/15/2018 23:34

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Instrument ID: A8_N Calibration Start Date: 03/15/2018 11:30
 GC Column: GeminiC18 3x100 ID: 3 (mm) Calibration End Date: 03/15/2018 11:53
 Calibration ID: 38167

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		936240	1.79	2723887	2.02		
UPPER LIMIT		1404360	2.29	4085831	2.52		
LOWER LIMIT		468120	1.29	1361944	1.52		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-213143/11		897894	1.79	2561754	2.02		
ICV 320-213143/13		885172	1.81	2569550	2.05		
CCV 320-213297/12 CCVIS		939380	1.80	2770557	2.03		
MB 320-212343/1-A		914267	1.78	2506093	2.01		
LCS 320-212343/2-A		948188	1.80	2549209	2.03		
320-36794-1	NAWC-030518-RW-055	952885	1.81	2609378	2.04		
320-36794-2	NAWC-030518-FRB-055	978146	1.82	2735043	2.00		
320-36794-3	NAWC-030518-RW-124	934535	1.80	2597022	2.03		
320-36794-4	NAWC-030518-FRB-124	942072	1.78	2599292	2.00		
320-36794-5	NAWC-030518-RW-201	951290	1.78	2713732	2.00		
320-36794-6	NAWC-030518-FRB-201	928357	1.79	2523021	2.02		
CCV 320-213297/22 CCVIS		931704	1.79	2735870	2.03		
CCV 320-213299/22 CCVIS		931704	1.79	2735870	2.03		
320-36794-7	NAWC-030518-RW-190	1104308	1.78	3172593	2.00		
320-36794-7 MS	NAWC-030518-RW-190 MS	946494	1.79	2804232	2.01		
320-36794-7 MSD	NAWC-030518-RW-190 MSD	950505	1.80	2664243	2.03		
320-36794-8	NAWC-030518-FRB-190	941171	1.78	2706073	2.01		
CCV 320-213299/28 CCVIS		958419	1.78	2710914	2.03		

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 50%-150% of internal standard area

RT Limit = $\pm$ 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.: 320-36794-1
 SDG No.: _____
 Sample No.: CCV 320-213297/12 Date Analyzed: 03/15/2018 22:24
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.03.15_537AAX_0 Heated Purge: (Y/N) N
 Calibration ID: 38167

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		939380	1.80	2770557	2.03		
UPPER LIMIT		1315132	2.30	3878780	2.53		
LOWER LIMIT		657566	1.30	1939390	1.53		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-212343/1-A		914267	1.78	2506093	2.01		
LCS 320-212343/2-A		948188	1.80	2549209	2.03		
320-36794-1	NAWC-030518-RW-055	952885	1.81	2609378	2.04		
320-36794-2	NAWC-030518-FRB-055	978146	1.82	2735043	2.00		
320-36794-3	NAWC-030518-RW-124	934535	1.80	2597022	2.03		
320-36794-4	NAWC-030518-FRB-124	942072	1.78	2599292	2.00		
320-36794-5	NAWC-030518-RW-201	951290	1.78	2713732	2.00		
320-36794-6	NAWC-030518-FRB-201	928357	1.79	2523021	2.02		

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area

RT Limit = $\pm$ 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.: 320-36794-1
 SDG No.: _____
 Sample No.: CCV 320-213297/22 Date Analyzed: 03/15/2018 23:11
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.03.15_537AAX_0 Heated Purge: (Y/N) N
 Calibration ID: 38167

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		931704	1.79	2735870	2.03		
UPPER LIMIT		1304386	2.29	3830218	2.53		
LOWER LIMIT		652193	1.29	1915109	1.53		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-212343/1-A		914267	1.78	2506093	2.01		
LCS 320-212343/2-A		948188	1.80	2549209	2.03		
320-36794-1	NAWC-030518-RW-055	952885	1.81	2609378	2.04		
320-36794-2	NAWC-030518-FRB-055	978146	1.82	2735043	2.00		
320-36794-3	NAWC-030518-RW-124	934535	1.80	2597022	2.03		
320-36794-4	NAWC-030518-FRB-124	942072	1.78	2599292	2.00		
320-36794-5	NAWC-030518-RW-201	951290	1.78	2713732	2.00		
320-36794-6	NAWC-030518-FRB-201	928357	1.79	2523021	2.02		

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area

RT Limit = $\pm$ 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.: 320-36794-1
 SDG No.: _____
 Sample No.: CCV 320-213299/22 Date Analyzed: 03/15/2018 23:11
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.03.15_537AAX_0 Heated Purge: (Y/N) N
 Calibration ID: 38167

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	931704	1.79	2735870	2.03		
UPPER LIMIT	1304386	2.29	3830218	2.53		
LOWER LIMIT	652193	1.29	1915109	1.53		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-36794-7	NAWC-030518-RW-190	1104308	1.78	3172593	2.00	
320-36794-7 MS	NAWC-030518-RW-190 MS	946494	1.79	2804232	2.01	
320-36794-7 MSD	NAWC-030518-RW-190 MSD	950505	1.80	2664243	2.03	
320-36794-8	NAWC-030518-FRB-190	941171	1.78	2706073	2.01	

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

Area Limit = 70%-140% of internal standard area
 RT Limit = $\pm$ 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.: 320-36794-1
 SDG No.: _____
 Sample No.: CCV 320-213299/28 Date Analyzed: 03/15/2018 23:39
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.03.15_537AAX_0 Heated Purge: (Y/N) N
 Calibration ID: 38167

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	958419	1.78	2710914	2.03		
UPPER LIMIT	1341787	2.28	3795280	2.53		
LOWER LIMIT	670893	1.28	1897640	1.53		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-36794-7	NAWC-030518-RW-190	1104308	1.78	3172593	2.00	
320-36794-7 MS	NAWC-030518-RW-190 MS	946494	1.79	2804232	2.01	
320-36794-7 MSD	NAWC-030518-RW-190 MSD	950505	1.80	2664243	2.03	
320-36794-8	NAWC-030518-FRB-190	941171	1.78	2706073	2.01	

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

Area Limit = 70%-140% of internal standard area
 RT Limit = $\pm$ 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.: 320-36794-1 Analy Batch No.: 213143

SDG No.: _____

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

Calibration Start Date: 03/15/2018 11:30 Calibration End Date: 03/15/2018 11:53 Calibration ID: 38167

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-213143/4	2018.03.15_537ICAL_004.d
Level 2	IC 320-213143/5	2018.03.15_537ICAL_005.d
Level 3	IC 320-213143/6	2018.03.15_537ICAL_006.d
Level 4	IC 320-213143/7	2018.03.15_537ICAL_007.d
Level 5	IC 320-213143/8	2018.03.15_537ICAL_008.d
Level 6	IC 320-213143/9	2018.03.15_537ICAL_009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	0.9615 0.8277	1.0154	1.0724	0.9800	0.8910	QuaF		1.1188	-0.001629						1.0000		0.9600
Perfluorohexanesulfonic acid (PFHxS)	1.4855 1.5075	1.5867	1.6850	1.6470	1.6032	Ave		1.5858				4.9		30.0			
Perfluoroheptanoic acid (PFHpA)	1.0392 0.9493	0.9927	1.0292	1.0002	1.0335	Ave		1.0073				3.4		30.0			
Perfluorooctanoic acid (PFOA)	0.9137 0.9029	0.9691	0.9597	0.9456	0.9500	Ave		0.9402				2.8		30.0			
Perfluorooctanesulfonic acid (PFOS)	0.8916 0.9324	0.9603	0.9715	0.9610	0.9676	Ave		0.9474				3.2		30.0			
Perfluorononanoic acid (PFNA)	0.7021 0.6834	0.7089	0.7427	0.7300	0.6931	Ave		0.7100				3.2		30.0			
13C2 PFHxA	1.0850 1.0881	1.1012	1.1019	1.1036	1.0712	Ave		1.0918				1.2		30.0			
13C2 PFDA	0.6169 0.6602	0.6128	0.6407	0.6046	0.6263	Ave		0.6269				3.3		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.: 320-36794-1 Analy Batch No.: 213143

SDG No.: _____

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

Calibration Start Date: 03/15/2018 11:30 Calibration End Date: 03/15/2018 11:53 Calibration ID: 38167

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-213143/4	2018.03.15_537ICAL_004.d
Level 2	IC 320-213143/5	2018.03.15_537ICAL_005.d
Level 3	IC 320-213143/6	2018.03.15_537ICAL_006.d
Level 4	IC 320-213143/7	2018.03.15_537ICAL_007.d
Level 5	IC 320-213143/8	2018.03.15_537ICAL_008.d
Level 6	IC 320-213143/9	2018.03.15_537ICAL_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	810375 13981920	1817233	4266637	8623606	12839615	9.00 180	20.0	45.0	90.0	135
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	417417 8490426	946838	2235192	4832262	7702560	3.00 60.0	6.67	15.0	30.0	45.0
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	94352 1724199	197150	453280	970758	1639248	1.00 20.0	2.22	5.00	10.0	15.0
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	166802 3297362	386975	849855	1845252	3029687	2.01 40.2	4.47	10.1	20.1	30.2
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	335376 7029722	767034	1725142	3773967	6222846	4.02 80.3	8.93	20.1	40.2	60.3
Perfluorononanoic acid (PFNA)	13PF OA	Ave	127510 2482937	281632	654246	1417278	2198770	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PF OA	Ave	984815 988034	983949	970362	1070945	1132420	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	559893 599445	547551	564249	586726	662151	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.: 320-36794-1 Analy Batch No.: 213143

SDG No.: _____

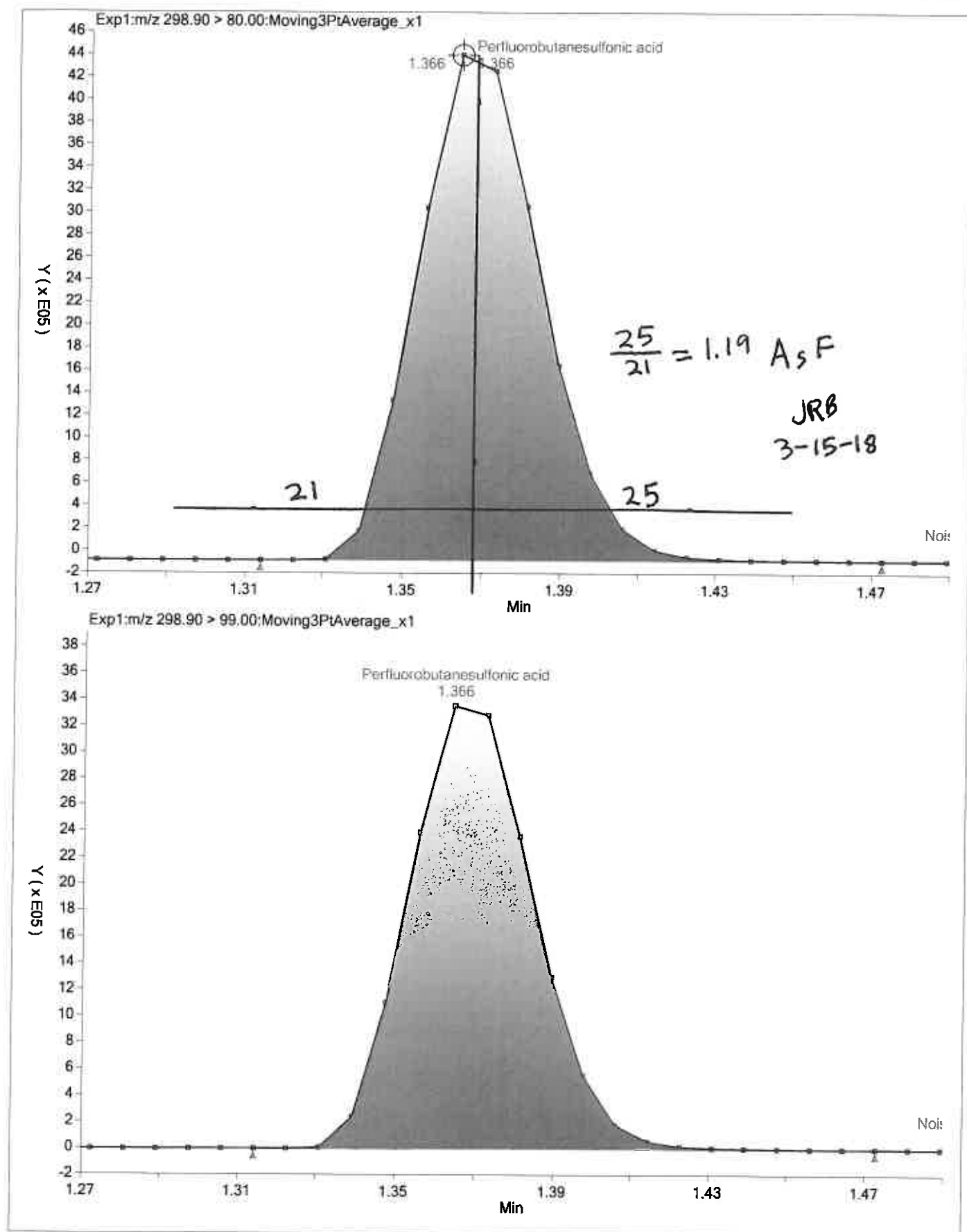
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

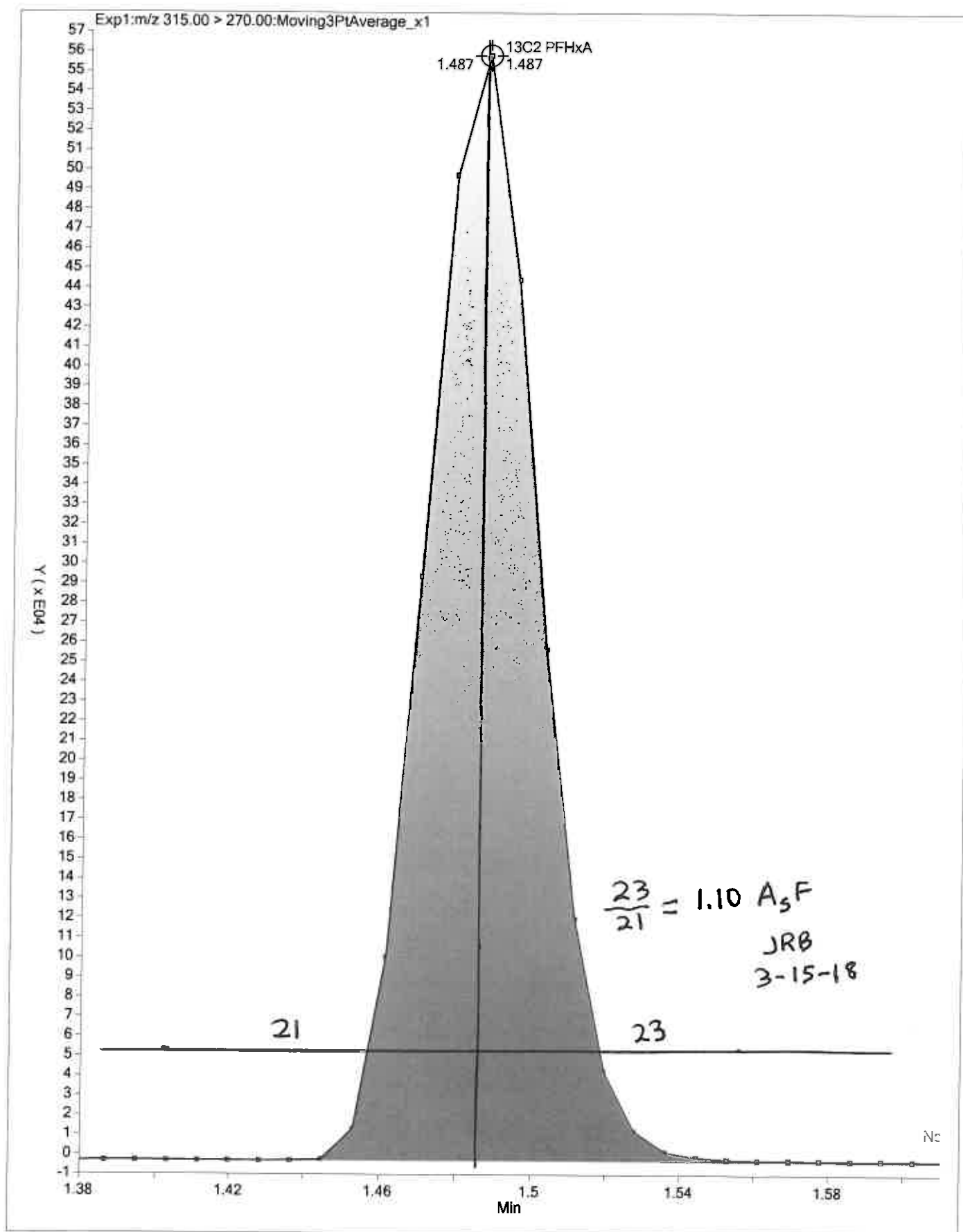
Calibration Start Date: 03/15/2018 11:30 Calibration End Date: 03/15/2018 11:53 Calibration ID: 38167

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-213143/4	2018.03.15_537ICAL_004.d
Level 2	IC 320-213143/5	2018.03.15_537ICAL_005.d
Level 3	IC 320-213143/6	2018.03.15_537ICAL_006.d
Level 4	IC 320-213143/7	2018.03.15_537ICAL_007.d
Level 5	IC 320-213143/8	2018.03.15_537ICAL_008.d
Level 6	IC 320-213143/9	2018.03.15_537ICAL_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)	-13.1	-6.7	2.8	0.9	-1.2	0.4	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	-6.3	0.1	6.3	3.9	1.1	-4.9	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	3.2	-1.5	2.2	-0.7	2.6	-5.8	50	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	-2.8	3.1	2.1	0.6	1.0	-4.0	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-5.9	1.4	2.5	1.4	2.1	-1.6	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-1.1	-0.2	4.6	2.8	-2.4	-3.8	50	30	30	30	30	30
13C2 PFHxA	-0.6	0.9	0.9	1.1	-1.9	-0.3	30	30	30	30	30	30
13C2 PFDA	-1.6	-2.3	2.2	-3.6	-0.1	5.3	30	30	30	30	30	30





TestAmerica Laboratories
Istd/Surrogate Recovery Report

Worklist Name: 14MAR2018A_537_ICAL

Worklist Num: 55366

Instrument: A8_N

Method: 537_A8_N

Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180315-55366.b

Limit Group: LC 537 ICAI

Analysis Type: SemiVOA

Inj Volume: 2.00

Inj Vol Units: ul

Lims Batch: 213143

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				942957 1.80	774128 2.04
# 1 RB	15-Mar-2018 11:15:59			931977 98.8 1.81	2623406> 338.9* 2.04
# 2 RB	15-Mar-2018 11:20:41			889728 94.4 1.81	2464820> 318.4* 2.06
# 3 RB	15-Mar-2018 11:25:25			1035289 109.8 1.80	2987398> 385.9* 2.03
IS Std					
# 4 IC L1	15-Mar-2018 11:30:04	1.49 99.38	2.23 98.40	907654> 100.0* 1.80	2685159> 100.0* 2.03
# 5 IC L2	15-Mar-2018 11:34:44	1.50 100.90	2.22 97.75	893553> 98.4* 1.79	2566276> 95.6* 2.01
# 6 IC L3	15-Mar-2018 11:39:24	1.50 100.90	2.22 102.20	880660> 97.0* 1.79	2535541> 94.4* 2.01
# 7 IC L4	15-Mar-2018 11:44:04	1.49 101.10	2.23 96.45	970381> 106.9* 1.80	2803911> 104.4* 2.03
# 8 IC L5	15-Mar-2018 11:48:46	1.49 98.11	2.22 99.91	1057188> 116.5* 1.79	3061123> 114.0* 2.02
# 9 IC L6	15-Mar-2018 11:53:25	1.50 99.66	2.22 105.30	908006> 100.0* 1.80	2691309> 100.2* 2.01
IS Std				880660 1.79	2535541 2.01
#10 RB	15-Mar-2018 11:58:05			862886 98.0 1.78	2538901 100.1 2.02
IS Std				970381 1.80	2803911 2.03
#11 CCVL	15-Mar-2018 12:02:46	1.49 98.81	2.22 93.73	897894 92.5 1.79	2561754 91.4 2.02
IS Std				897894 1.79	2561754 2.02
#12 RB	15-Mar-2018 12:07:26			882538 98.3 1.77	2649606 103.4 1.93
IS Std				970381 1.80	
#13 ICV	15-Mar-2018 12:12:05	1.50 107.50		763341 78.7 1.64	
#14 RB	15-Mar-2018 12:16:45				

13C2-PFDA

$$RPD = \frac{1057188 - 880660}{\left(\frac{1057188 + 880660}{2} \right)} \times 100 = 18.2$$

13C4-PFOS

$$RPD = \frac{3061123 - 2535541}{\left(\frac{3061123 + 2535541}{2} \right)} \times 100 = 18.8$$

JRB 3-15-18

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-213143/11 Calibration Date: 03/15/2018 12:02
 Instrument ID: A8_N Calib Start Date: 03/15/2018 11:30
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/15/2018 11:53
 Lab File ID: 2018.03.15_537ICAL_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		1.033		19.0	20.0	-5.0	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.586	1.566		6.58	6.67	-1.3	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.007	1.057		2.33	2.22	4.9	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9402	0.9814		4.67	4.47	4.4	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9474	0.9554		9.00	8.93	0.8	50.0
Perfluorononanoic acid (PFNA)	Ave	0.7100	0.7134		4.47	4.45	0.5	50.0
13C2 PFHxA	Ave	1.092	1.079		9.88	10.0	-1.2	30.0
13C2 PFDA	Ave	0.6269	0.5876		9.37	10.0	-6.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Lab Sample ID: ICV 320-213143/13 Calibration Date: 03/15/2018 14:35
 Instrument ID: A8_N Calib Start Date: 03/15/2018 11:30
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/15/2018 11:53
 Lab File ID: 2018.03.15_537ICALA_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		0.9771		103	100	2.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.007	0.997		9.90	10.0	-1.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.586	1.618		20.6	20.2	2.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9402	0.8934		19.2	20.2	-5.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9474	0.9723		20.7	20.2	2.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7100	0.7487		21.3	20.2	5.4	30.0
13C2 PFHxA	Ave	1.092	1.087		9.96	10.0	-0.4	30.0
13C2 PFDA	Ave	0.6269	0.6217		9.92	10.0	-0.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Lab Sample ID: CCV 320-213297/12 Calibration Date: 03/15/2018 22:24
 Instrument ID: A8_N Calib Start Date: 03/15/2018 11:30
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/15/2018 11:53
 Lab File ID: 2018.03.15_537AAX_016.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.8977		135	135	-0.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.586	1.538		43.6	45.0	-3.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.007	0.9604		14.3	15.0	-4.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9402	0.9890		31.7	30.2	5.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9474	0.9455		60.1	60.3	-0.2	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7100	0.6924		29.3	30.0	-2.5	30.0
13C2 PFHxA	Ave	1.092	1.061		9.72	10.0	-2.8	30.0
13C2 PFDA	Ave	0.6269	0.6400		10.2	10.0	2.1	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Lab Sample ID: CCV 320-213297/22 Calibration Date: 03/15/2018 23:11
 Instrument ID: A8_N Calib Start Date: 03/15/2018 11:30
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/15/2018 11:53
 Lab File ID: 2018.03.15_537AAX_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		1.030		44.3	45.0	-1.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.007	1.016		5.04	5.00	0.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.586	1.550		14.7	15.0	-2.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9402	0.9844		10.5	10.1	4.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9474	0.9342		19.8	20.1	-1.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7100	0.7170		10.1	10.0	1.0	30.0
13C2 PFHxA	Ave	1.092	1.087		9.96	10.0	-0.4	30.0
13C2 PFDA	Ave	0.6269	0.6572		10.5	10.0	4.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Lab Sample ID: CCV 320-213299/22 Calibration Date: 03/15/2018 23:11
 Instrument ID: A8_N Calib Start Date: 03/15/2018 11:30
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/15/2018 11:53
 Lab File ID: 2018.03.15_537AAX_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		1.030		44.3	45.0	-1.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.007	1.016		5.04	5.00	0.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.586	1.550		14.7	15.0	-2.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9402	0.9844		10.5	10.1	4.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9474	0.9342		19.8	20.1	-1.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7100	0.7170		10.1	10.0	1.0	30.0
13C2 PFHxA	Ave	1.092	1.087		9.96	10.0	-0.4	30.0
13C2 PFDA	Ave	0.6269	0.6572		10.5	10.0	4.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Lab Sample ID: CCV 320-213299/28 Calibration Date: 03/15/2018 23:39
 Instrument ID: A8_N Calib Start Date: 03/15/2018 11:30
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/15/2018 11:53
 Lab File ID: 2018.03.15_537AAX_032.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.9006		135	135	0.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.007	0.9714		14.5	15.0	-3.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.586	1.619		46.0	45.0	2.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9402	0.9455		30.3	30.2	0.6	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9474	0.9949		63.3	60.3	5.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7100	0.7160		30.3	30.0	0.8	30.0
13C2 PFHxA	Ave	1.092	1.072		9.81	10.0	-1.9	30.0
13C2 PFDA	Ave	0.6269	0.6189		9.87	10.0	-1.3	30.0

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-212343/1-A
 Matrix: Water Lab File ID: 2018.03.15_537AAX_018.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 03/12/2018 07:09
 Sample wt/vol: 250 (mL) Date Analyzed: 03/15/2018 22:34
 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.: 213297 Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	108		70-130

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-36794-1

SDG No.: _____

Instrument ID: A8_NStart Date: 03/15/2018 11:30Analysis Batch Number: 213143End Date: 03/15/2018 14:35

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-213143/4		03/15/2018 11:30	1	2018.03.15_537I CAL 004.d	GeminiC18 3x100 3(mm)
IC 320-213143/5		03/15/2018 11:34	1	2018.03.15_537I CAL 005.d	GeminiC18 3x100 3(mm)
IC 320-213143/6		03/15/2018 11:39	1	2018.03.15_537I CAL 006.d	GeminiC18 3x100 3(mm)
IC 320-213143/7 ICISAV		03/15/2018 11:44	1	2018.03.15_537I CAL 007.d	GeminiC18 3x100 3(mm)
IC 320-213143/8		03/15/2018 11:48	1	2018.03.15_537I CAL 008.d	GeminiC18 3x100 3(mm)
IC 320-213143/9		03/15/2018 11:53	1	2018.03.15_537I CAL 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		03/15/2018 11:58	1		GeminiC18 3x100 3(mm)
CCVL 320-213143/11		03/15/2018 12:02	1	2018.03.15_537I CAL 011.d	GeminiC18 3x100 3(mm)
ZZZZZ		03/15/2018 12:07	1		GeminiC18 3x100 3(mm)
ICV 320-213143/13		03/15/2018 14:35	1	2018.03.15_537I CALA 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-36794-1

SDG No.: _____

Instrument ID: A8_NStart Date: 03/15/2018 22:24Analysis Batch Number: 213297End Date: 03/15/2018 23:11

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-213297/12 CCVIS		03/15/2018 22:24	1	2018.03.15_537A AX 016.d	GeminiC18 3x100 3(mm)
MB 320-212343/1-A		03/15/2018 22:34	1	2018.03.15_537A AX 018.d	GeminiC18 3x100 3(mm)
LCS 320-212343/2-A		03/15/2018 22:38	1	2018.03.15_537A AX 019.d	GeminiC18 3x100 3(mm)
320-36794-1		03/15/2018 22:43	1	2018.03.15_537A AX 020.d	GeminiC18 3x100 3(mm)
320-36794-2		03/15/2018 22:48	1	2018.03.15_537A AX 021.d	GeminiC18 3x100 3(mm)
320-36794-3		03/15/2018 22:52	1	2018.03.15_537A AX 022.d	GeminiC18 3x100 3(mm)
320-36794-4		03/15/2018 22:57	1	2018.03.15_537A AX 023.d	GeminiC18 3x100 3(mm)
320-36794-5		03/15/2018 23:02	1	2018.03.15_537A AX 024.d	GeminiC18 3x100 3(mm)
320-36794-6		03/15/2018 23:06	1	2018.03.15_537A AX 025.d	GeminiC18 3x100 3(mm)
CCV 320-213297/22 CCVIS		03/15/2018 23:11	1	2018.03.15_537A AX 026.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Instrument ID: A8_N Start Date: 03/15/2018 23:11Analysis Batch Number: 213299 End Date: 03/15/2018 23:39

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-213299/22 CCVIS		03/15/2018 23:11	1	2018.03.15_537A AX 026.d	GeminiC18 3x100 3(mm)
320-36794-7		03/15/2018 23:20	1	2018.03.15_537A AX 028.d	GeminiC18 3x100 3(mm)
320-36794-7 MS		03/15/2018 23:25	1	2018.03.15_537A AX 029.d	GeminiC18 3x100 3(mm)
320-36794-7 MSD		03/15/2018 23:30	1	2018.03.15_537A AX 030.d	GeminiC18 3x100 3(mm)
320-36794-8		03/15/2018 23:34	1	2018.03.15_537A AX 031.d	GeminiC18 3x100 3(mm)
CCV 320-213299/28 CCVIS		03/15/2018 23:39	1	2018.03.15_537A AX 032.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Batch Number: 212343 Batch Start Date: 03/12/18 07:09 Batch Analyst: Kouchari, ShamiranBatch Method: 537 Batch End Date: 03/13/18 17:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00052
MB 320-212343/1		537, 537				250 mL	1.00 mL	7 SU	100 uL
LCS 320-212343/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-36794-A-1	NAWC-030518-RW-055	537, 537	T	286.27 g	29.34 g	256.9 mL	1.00 mL	7 SU	100 uL
320-36794-A-2	NAWC-030518-FRB-055	537, 537	T	290.19 g	28.85 g	261.3 mL	1.00 mL	7 SU	100 uL
320-36794-A-3	NAWC-030518-RW-124	537, 537	T	276.68 g	29.33 g	247.4 mL	1.00 mL	7 SU	100 uL
320-36794-A-4	NAWC-030518-FRB-124	537, 537	T	281.91 g	28.78 g	253.1 mL	1.00 mL	7 SU	100 uL
320-36794-A-5	NAWC-030518-RW-201	537, 537	T	291.25 g	31.05 g	260.2 mL	1.00 mL	7 SU	100 uL
320-36794-A-6	NAWC-030518-FRB-201	537, 537	T	286.49 g	29.27 g	257.2 mL	1.00 mL	7 SU	100 uL
320-36794-A-7	NAWC-030518-RW-190	537, 537	T	291.72 g	31.07 g	260.7 mL	1.00 mL	7 SU	100 uL
320-36794-A-7 MS	NAWC-030518-RW-190	537, 537	T	288.06 g	29.48 g	258.6 mL	1.00 mL	7 SU	100 uL
320-36794-A-7 MSD	NAWC-030518-RW-190	537, 537	T	303.07 g	29.02 g	274.1 mL	1.00 mL	7 SU	100 uL
320-36794-A-8	NAWC-030518-FRB-190	537, 537	T	309.19 g	30.77 g	278.4 mL	1.00 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-MSP 00032	LC537-SU 00062	AnalysisComment			
MB 320-212343/1		537, 537			100 uL	Chlorine, ND			
LCS 320-212343/2		537, 537		100 uL	100 uL	Chlorine, ND			
320-36794-A-1	NAWC-030518-RW-055	537, 537	T		100 uL	Chlorine, ND			
320-36794-A-2	NAWC-030518-FRB-055	537, 537	T		100 uL	Chlorine, ND			
320-36794-A-3	NAWC-030518-RW-124	537, 537	T		100 uL	Chlorine, ND			
320-36794-A-4	NAWC-030518-FRB-124	537, 537	T		100 uL	Chlorine, ND			
320-36794-A-5	NAWC-030518-RW-201	537, 537	T		100 uL	Chlorine, ND			
320-36794-A-6	NAWC-030518-FRB-201	537, 537	T		100 uL	Chlorine, ND			

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

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-36794-1

SDG No.: _____

Batch Number: 212343 Batch Start Date: 03/12/18 07:09 Batch Analyst: Kouchari, ShamiranBatch Method: 537 Batch End Date: 03/13/18 17:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-MSP 00032	LC537-SU 00062	AnalysisComment			
320-36794-A-7	NAWC-030518-RW-190	537, 537	T		100 uL	Chlorine, ND			
320-36794-A-7 MS	NAWC-030518-RW-190	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-36794-A-7 MSD	NAWC-030518-RW-190	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-36794-A-8	NAWC-030518-FRB-190	537, 537	T		100 uL	Chlorine, ND			

Batch Notes	
Analyst ID - Aliquot Step	VPM
Batch Comment	Client labels match TA labels, 03/12/18 SKD
Analyst ID - Concentration	SKD/KMK
Analyst ID - Final Volume Step	VPM
Internal Standard ID#	1048713
Manifold ID	1
Methanol ID	1175203
pH Indicator ID	3817
Pipette ID	H14930F
Analyst ID - IS Reagent Drop	KMK
Analyst ID - IS Reagent Drop Witness	JER
Analyst ID - SU Reagent Drop	HJA
Analyst ID - SU Reagent Drop Witness	KMK
Analyst ID - TA Reagent Drop	HJA
Analyst ID - TA Reagent Drop Witness	KMK
SPE Cartridge Lot ID	6369499
Trizma ID	SLBR5241V
Reagent Water ID	03/08/18

Basis	Basis Description
T	Total/NA

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

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-212343 ✓

Analyst: Kouchari, Shamiran

Batch Open: 3/12/2018 7:09:00AM

Method Code: 320-537_Prep-320

Batch End: 3/13/2018 5:30:00PM

Extraction of Perfluorinated Alkyl Acids

Due: 3/27

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB-320-212343/1 N/A	N/A		250 mL	7			N/A	N/A	N/A	Chlorine, ND	
			1.00 mL								
2 LCS-320-212343/2 N/A	N/A		250 mL	7			N/A	N/A	N/A	Chlorine, ND RI	
			1.00 mL								
3 320-36794-A-1 (537_DOD5)	N/A (320-36794-1)	286.27 g	256.9 mL	7			3/10/18	16_Days	4	Chlorine, ND RI	
		29.34 g	1.00 mL								
4 320-36794-A-2 (537_DOD5)	N/A (320-36794-1)	290.19 g	261.3 mL	7			3/10/18	16_Days	4	Chlorine, ND	
		28.85 g	1.00 mL								
5 320-36794-A-3 (537_DOD5)	N/A (320-36794-1)	276.68 g	247.4 mL	7			3/10/18	16_Days	4	Chlorine, ND	
		29.33 g	1.00 mL								
6 320-36794-A-4 (537_DOD5)	N/A (320-36794-1)	281.91 g	253.1 mL	7			3/10/18	16_Days	4	Chlorine, ND	
		28.78 g	1.00 mL								
7 320-36794-A-5 (537_DOD5)	N/A (320-36794-1)	291.25 g	260.2 mL	7			3/10/18	16_Days	4	Chlorine, ND RI	
		31.05 g	1.00 mL								
8 320-36794-A-6 (537_DOD5)	N/A (320-36794-1)	286.49 g	257.2 mL	7			3/10/18	16_Days	4	Chlorine, ND RI	
		29.27 g	1.00 mL								
9 320-36794-A-7 (537_DOD5)	N/A (320-36794-1)	291.72 g	260.7 mL	7			3/10/18	16_Days	4	Chlorine, ND RI	
		31.07 g	1.00 mL								
10 320-36794-A-7-MS (537_DOD5)	N/A (320-36794-1)	288.06 g	258.6 mL	7			3/10/18	16_Days	4	Chlorine, ND RI	
		29.48 g	1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-212343

Analyst: Kouchari, Shamiran

Batch Open: 3/12/2018 7:09:00AM

Method Code: 320-537_Prep-320

Batch End: 3/13/2018 5:30:00PM

11	320-36794-A-7~MSD (537_DOD5)	N/A (320-36794-1)	303.07 g	274.1 mL	7		3/10/18	16_Days	4	Chlorine, ND	RI	
			29.02 g	1.00 mL								
12	320-36794-A-8 (537_DOD5)	N/A (320-36794-1)	309.19 g	278.4 mL	7		3/10/18	16_Days	4	Chlorine, ND	RI	
			30.77 g	1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-212343

Analyst: Kouchari, Shamiran

Batch Open: 3/12/2018 7:09:00AM

Method Code: 320-537_Prep-320

Batch End: 3/13/2018 5:30:00PM

Batch Notes

Manifold ID 1

pH Indicator ID 3817

Trizma ID SLBR5241V

SPE Cartridge Lot ID 6369499

Methanol ID 1175203

Reagent Water ID 03/08/18

Internal Standard ID# 1048713

Pipette ID H14930F

Analyst ID - TA Reagent Drop HJA

Analyst ID - TA Reagent Drop KMK

Witness

Analyst ID - SU Reagent Drop HJA

Analyst ID - SU Reagent Drop KMK

Witness

Analyst ID - IS Reagent Drop KMK

Analyst ID - IS Reagent Drop JER

Witness

Analyst ID - Concentration SKD/KMK

Analyst ID - Aliquot Step VPM

Analyst ID - Final Volume Step VPM

Batch Comment Client labels match TA labels, 03/12/18 SKD

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-212343

Analyst: Kouchari, Shamiran

Batch Open: 3/12/2018 7:09:00AM

Method Code: 320-537_Prep-320

Batch End: 3/13/2018 5:30:00PM

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-212343

Analyst: Kouchari, Shamiran

Batch Open: 3/12/2018 7:09:00AM

Method Code: 320-537_Prep-320

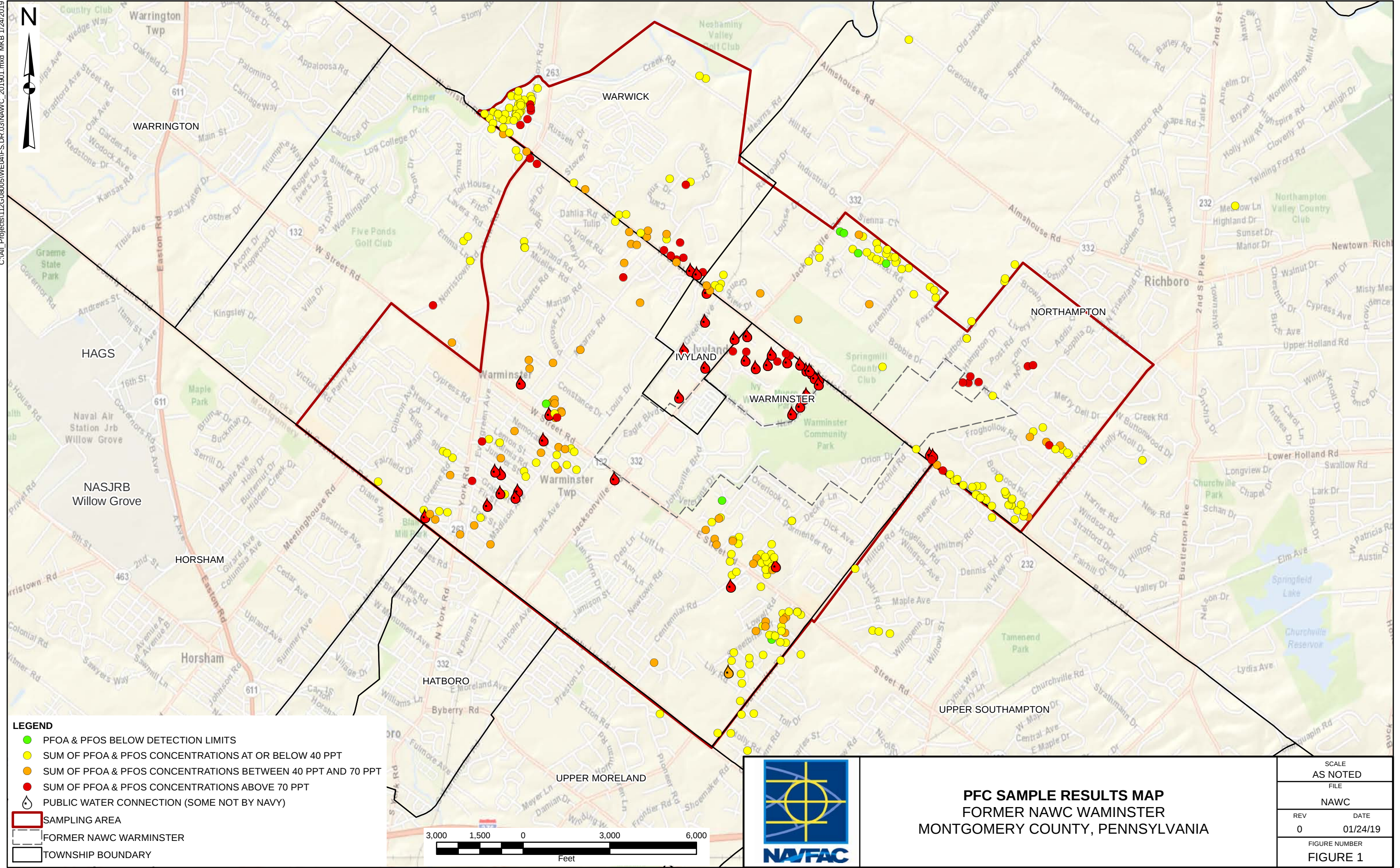
Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-212343/1	LC537-SU_00062	100 uL	1.00 mL	HJA 3-12-18	KMK-3-12-18
LCS 320-212343/2	LC537-MSP_00032	100 uL	1.00 mL		
LCS 320-212343/2	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-1	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-2	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-3	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-4	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-5	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-6	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-7	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-7 MS	LC537-MSP_00032	100 uL	1.00 mL		
320-36794-A-7 MS	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-7 MSD	LC537-MSP_00032	100 uL	1.00 mL		
320-36794-A-7 MSD	LC537-SU_00062	100 uL	1.00 mL		
320-36794-A-8	LC537-SU_00062	100 uL	1.00 mL		

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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 WARMINSTER

TOWNSHIP BOUNDARY



PFC SAMPLE RESULTS MAP

FORMER NAWC WARMINSTER

MONTGOMERY COUNTY, PENNSYLVANIA

SCALE

AS NOTED

FILE

NAWC

REV

DATE

0

01/24/19

FIGURE NUMBER

FIGURE 1