



**Groundwater Sample Results,
Combined Level 2 and Level 4 Laboratory Report,
Electronic Data Deliverable, Data Validation Report,
and the Sample Location Report, SDG 320-41679-1**

*Naval Air Warfare Center Warminster
Warminster, Pennsylvania*

August 2019

N62269_001187
WARMINSTER_NAWC
SSIC 5000-33c

**LABORATORY DATA PACKAGE, 320-41679-1, NAS WILLOW GROVE NAWC
WARMINSTER PA**
08/15/2018
TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

ANALYTICAL REPORT

Job Number: 320-41679-1

Job Description: WE04

For:

Tetra Tech, Inc.

234 Mall Boulevard

Suite 260

King of Prussia, PA 19406

Attention: Andy Frebowitz



Approved for release.
David R. Alltucker
Project Manager I
8/15/2018 2:19 PM

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08/15/2018

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Definitions/Glossary

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

Qualifiers

LCMS

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

Glossary

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

Job Narrative
320-41679-1

Receipt

The samples were received on 8/1/2018 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.7° C.

LCMS

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

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

Organic Prep

Method(s) 537: The following sample: NAWC-073118-RW-154 (320-41679-3) in preparation batch 320-237969 was observed to be a yellow color prior to extraction and after it was brought to final volume.

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

Detection Summary

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

Client Sample ID: WGNA-073118-RW-3785

Lab Sample ID: 320-41679-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	11	J	42	7.1	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	16	J	21	2.9	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	15	J	31	5.7	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.9	J	10	2.0	ng/L	1		537	Total/NA

Client Sample ID: WGNA-073118-FRB-3785

Lab Sample ID: 320-41679-2

No Detections.

Client Sample ID: NAWC-073118-RW-154

Lab Sample ID: 320-41679-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	17	J	39	6.7	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	24		20	2.8	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	8.9	J	9.8	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-073118-FRB-154

Lab Sample ID: 320-41679-4

No Detections.

Client Sample ID: NAWC-073118-RW-185

Lab Sample ID: 320-41679-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	15	J	38	6.4	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	12	J	19	2.6	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	8.5	J	28	5.2	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	8.2	J	9.4	1.8	ng/L	1		537	Total/NA

Client Sample ID: NAWC-073118-FRB-185

Lab Sample ID: 320-41679-6

No Detections.

Client Sample ID: NAWC-073118-RW-179

Lab Sample ID: 320-41679-7

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	17	J	39	6.6	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	21		19	2.7	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	7.1	J	29	5.3	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.0	J	9.7	1.8	ng/L	1		537	Total/NA

Client Sample ID: NAWC-073118-FRB-179

Lab Sample ID: 320-41679-8

No Detections.

Client Sample ID: NAWC-073118-RW-124

Lab Sample ID: 320-41679-9

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	31	J	39	6.7	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	20		20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	14	J	30	5.4	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.7	J	9.9	1.9	ng/L	1		537	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

Client Sample ID: NAWC-073118-FRB-124

Lab Sample ID: 320-41679-10

No Detections.

Client Sample ID: WGNA-073118-RW-3103

Lab Sample ID: 320-41679-11

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	7.1	J	39	6.6	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	8.3	J	19	2.7	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.4	J M	9.6	1.8	ng/L	1		537	Total/NA

Client Sample ID: WGNA-073118-FRB-3103

Lab Sample ID: 320-41679-12

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

Client Sample ID: WGNA-073118-RW-3785

Lab Sample ID: 320-41679-1

Date Collected: 07/31/18 08:40

Matrix: Water

Date Received: 08/01/18 09:45

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	11	J	42	7.1	ng/L		08/04/18 08:24	08/08/18 04:50	1
Perfluorooctanoic acid (PFOA)	16	J	21	2.9	ng/L		08/04/18 08:24	08/08/18 04:50	1
Perfluorononanoic acid (PFNA)	21	U	25	8.3	ng/L		08/04/18 08:24	08/08/18 04:50	1
Perfluorohexanesulfonic acid (PFHxS)	15	J	31	5.7	ng/L		08/04/18 08:24	08/08/18 04:50	1
Perfluoroheptanoic acid (PFHpA)	5.9	J	10	2.0	ng/L		08/04/18 08:24	08/08/18 04:50	1
Perfluorobutanesulfonic acid (PFBS)	37	U	94	17	ng/L		08/04/18 08:24	08/08/18 04:50	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	88		70 - 130				08/04/18 08:24	08/08/18 04:50	1
13C2 PFDA	103		70 - 130				08/04/18 08:24	08/08/18 04:50	1

Client Sample ID: WGNA-073118-FRB-3785

Lab Sample ID: 320-41679-2

Date Collected: 07/31/18 08:35

Matrix: Water

Date Received: 08/01/18 09:45

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		08/04/18 08:24	08/08/18 05:04	1
Perfluorooctanoic acid (PFOA)	7.6	U	19	2.7	ng/L		08/04/18 08:24	08/08/18 05:04	1
Perfluorononanoic acid (PFNA)	19	U	23	7.6	ng/L		08/04/18 08:24	08/08/18 05:04	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	29	5.3	ng/L		08/04/18 08:24	08/08/18 05:04	1
Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	1.8	ng/L		08/04/18 08:24	08/08/18 05:04	1
Perfluorobutanesulfonic acid (PFBS)	34	U	86	15	ng/L		08/04/18 08:24	08/08/18 05:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	86		70 - 130				08/04/18 08:24	08/08/18 05:04	1
13C2 PFDA	97		70 - 130				08/04/18 08:24	08/08/18 05:04	1

Client Sample ID: NAWC-073118-RW-154

Lab Sample ID: 320-41679-3

Date Collected: 07/31/18 10:10

Matrix: Water

Date Received: 08/01/18 09:45

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	17	J	39	6.7	ng/L		08/04/18 08:24	08/08/18 05:09	1
Perfluorooctanoic acid (PFOA)	24		20	2.8	ng/L		08/04/18 08:24	08/08/18 05:09	1
Perfluorononanoic acid (PFNA)	20	U	24	7.9	ng/L		08/04/18 08:24	08/08/18 05:09	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.4	ng/L		08/04/18 08:24	08/08/18 05:09	1
Perfluoroheptanoic acid (PFHpA)	8.9	J	9.8	1.9	ng/L		08/04/18 08:24	08/08/18 05:09	1
Perfluorobutanesulfonic acid (PFBS)	35	U	88	16	ng/L		08/04/18 08:24	08/08/18 05:09	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	80		70 - 130				08/04/18 08:24	08/08/18 05:09	1
13C2 PFDA	94		70 - 130				08/04/18 08:24	08/08/18 05:09	1

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

Client Sample ID: NAWC-073118-FRB-154

Lab Sample ID: 320-41679-4

Date Collected: 07/31/18 10:05

Matrix: Water

Date Received: 08/01/18 09:45

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		08/04/18 08:24	08/08/18 05:13	1
Perfluorooctanoic acid (PFOA)	7.8	U	19	2.7	ng/L		08/04/18 08:24	08/08/18 05:13	1
Perfluorononanoic acid (PFNA)	19	U	23	7.8	ng/L		08/04/18 08:24	08/08/18 05:13	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.3	ng/L		08/04/18 08:24	08/08/18 05:13	1
Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	1.8	ng/L		08/04/18 08:24	08/08/18 05:13	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	16	ng/L		08/04/18 08:24	08/08/18 05:13	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	86		70 - 130	08/04/18 08:24	08/08/18 05:13	1
13C2 PFDA	98		70 - 130	08/04/18 08:24	08/08/18 05:13	1

Client Sample ID: NAWC-073118-RW-185

Lab Sample ID: 320-41679-5

Date Collected: 07/31/18 11:10

Matrix: Water

Date Received: 08/01/18 09:45

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	J	38	6.4	ng/L		08/04/18 08:24	08/08/18 05:18	1
Perfluorooctanoic acid (PFOA)	12	J	19	2.6	ng/L		08/04/18 08:24	08/08/18 05:18	1
Perfluorononanoic acid (PFNA)	19	U	23	7.5	ng/L		08/04/18 08:24	08/08/18 05:18	1
Perfluorohexanesulfonic acid (PFHxS)	8.5	J	28	5.2	ng/L		08/04/18 08:24	08/08/18 05:18	1
Perfluoroheptanoic acid (PFHpA)	8.2	J	9.4	1.8	ng/L		08/04/18 08:24	08/08/18 05:18	1
Perfluorobutanesulfonic acid (PFBS)	34	U	85	15	ng/L		08/04/18 08:24	08/08/18 05:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	81		70 - 130	08/04/18 08:24	08/08/18 05:18	1
13C2 PFDA	94		70 - 130	08/04/18 08:24	08/08/18 05:18	1

Client Sample ID: NAWC-073118-FRB-185

Lab Sample ID: 320-41679-6

Date Collected: 07/31/18 11:05

Matrix: Water

Date Received: 08/01/18 09:45

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	41	7.0	ng/L		08/04/18 08:24	08/08/18 05:23	1
Perfluorooctanoic acid (PFOA)	8.2	U	20	2.9	ng/L		08/04/18 08:24	08/08/18 05:23	1
Perfluorononanoic acid (PFNA)	20	U	25	8.2	ng/L		08/04/18 08:24	08/08/18 05:23	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	31	5.6	ng/L		08/04/18 08:24	08/08/18 05:23	1
Perfluoroheptanoic acid (PFHpA)	4.1	U	10	1.9	ng/L		08/04/18 08:24	08/08/18 05:23	1
Perfluorobutanesulfonic acid (PFBS)	37	U	92	16	ng/L		08/04/18 08:24	08/08/18 05:23	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	98		70 - 130	08/04/18 08:24	08/08/18 05:23	1
13C2 PFDA	103		70 - 130	08/04/18 08:24	08/08/18 05:23	1

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

Client Sample ID: NAWC-073118-RW-179

Lab Sample ID: 320-41679-7

Date Collected: 07/31/18 12:10

Matrix: Water

Date Received: 08/01/18 09:45

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	17	J	39	6.6	ng/L		08/04/18 08:24	08/08/18 05:37	1
Perfluorooctanoic acid (PFOA)	21		19	2.7	ng/L		08/04/18 08:24	08/08/18 05:37	1
Perfluorononanoic acid (PFNA)	19	U	23	7.8	ng/L		08/04/18 08:24	08/08/18 05:37	1
Perfluorohexanesulfonic acid (PFHxS)	7.1	J	29	5.3	ng/L		08/04/18 08:24	08/08/18 05:37	1
Perfluoroheptanoic acid (PFHpA)	6.0	J	9.7	1.8	ng/L		08/04/18 08:24	08/08/18 05:37	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	16	ng/L		08/04/18 08:24	08/08/18 05:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	87		70 - 130				08/04/18 08:24	08/08/18 05:37	1
13C2 PFDA	101		70 - 130				08/04/18 08:24	08/08/18 05:37	1

Client Sample ID: NAWC-073118-FRB-179

Lab Sample ID: 320-41679-8

Date Collected: 07/31/18 12:05

Matrix: Water

Date Received: 08/01/18 09:45

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		08/04/18 08:24	08/08/18 05:41	1
Perfluorooctanoic acid (PFOA)	7.9	U	20	2.8	ng/L		08/04/18 08:24	08/08/18 05:41	1
Perfluorononanoic acid (PFNA)	20	U	24	7.9	ng/L		08/04/18 08:24	08/08/18 05:41	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.4	ng/L		08/04/18 08:24	08/08/18 05:41	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	9.9	1.9	ng/L		08/04/18 08:24	08/08/18 05:41	1
Perfluorobutanesulfonic acid (PFBS)	36	U	89	16	ng/L		08/04/18 08:24	08/08/18 05:41	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	87		70 - 130				08/04/18 08:24	08/08/18 05:41	1
13C2 PFDA	101		70 - 130				08/04/18 08:24	08/08/18 05:41	1

Client Sample ID: NAWC-073118-RW-124

Lab Sample ID: 320-41679-9

Date Collected: 07/31/18 12:40

Matrix: Water

Date Received: 08/01/18 09:45

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	31	J	39	6.7	ng/L		08/04/18 08:24	08/08/18 05:46	1
Perfluorooctanoic acid (PFOA)	20		20	2.8	ng/L		08/04/18 08:24	08/08/18 05:46	1
Perfluorononanoic acid (PFNA)	20	U	24	7.9	ng/L		08/04/18 08:24	08/08/18 05:46	1
Perfluorohexanesulfonic acid (PFHxS)	14	J	30	5.4	ng/L		08/04/18 08:24	08/08/18 05:46	1
Perfluoroheptanoic acid (PFHpA)	4.7	J	9.9	1.9	ng/L		08/04/18 08:24	08/08/18 05:46	1
Perfluorobutanesulfonic acid (PFBS)	35	U	89	16	ng/L		08/04/18 08:24	08/08/18 05:46	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	83		70 - 130				08/04/18 08:24	08/08/18 05:46	1
13C2 PFDA	94		70 - 130				08/04/18 08:24	08/08/18 05:46	1

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

Client Sample ID: NAWC-073118-FRB-124

Lab Sample ID: 320-41679-10

Date Collected: 07/31/18 12:35

Matrix: Water

Date Received: 08/01/18 09:45

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	39	6.7	ng/L		08/04/18 08:24	08/08/18 05:51	1
Perfluorooctanoic acid (PFOA)	7.9	U	20	2.8	ng/L		08/04/18 08:24	08/08/18 05:51	1
Perfluorononanoic acid (PFNA)	20	U	24	7.9	ng/L		08/04/18 08:24	08/08/18 05:51	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.4	ng/L		08/04/18 08:24	08/08/18 05:51	1
Perfluoroheptanoic acid (PFHpA)	3.9	U	9.8	1.9	ng/L		08/04/18 08:24	08/08/18 05:51	1
Perfluorobutanesulfonic acid (PFBS)	35	U	88	16	ng/L		08/04/18 08:24	08/08/18 05:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	87		70 - 130	08/04/18 08:24	08/08/18 05:51	1
13C2 PFDA	91		70 - 130	08/04/18 08:24	08/08/18 05:51	1

Client Sample ID: WGNA-073118-RW-3103

Lab Sample ID: 320-41679-11

Date Collected: 07/31/18 13:40

Matrix: Water

Date Received: 08/01/18 09:45

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	7.1	J	39	6.6	ng/L		08/04/18 08:24	08/08/18 05:55	1
Perfluorooctanoic acid (PFOA)	8.3	J	19	2.7	ng/L		08/04/18 08:24	08/08/18 05:55	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L		08/04/18 08:24	08/08/18 05:55	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.3	ng/L		08/04/18 08:24	08/08/18 05:55	1
Perfluoroheptanoic acid (PFHpA)	2.4	J M	9.6	1.8	ng/L		08/04/18 08:24	08/08/18 05:55	1
Perfluorobutanesulfonic acid (PFBS)	35	U M	87	16	ng/L		08/04/18 08:24	08/08/18 05:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	90		70 - 130	08/04/18 08:24	08/08/18 05:55	1
13C2 PFDA	99		70 - 130	08/04/18 08:24	08/08/18 05:55	1

Client Sample ID: WGNA-073118-FRB-3103

Lab Sample ID: 320-41679-12

Date Collected: 07/31/18 13:35

Matrix: Water

Date Received: 08/01/18 09:45

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		08/04/18 08:24	08/08/18 06:00	1
Perfluorooctanoic acid (PFOA)	7.7	U	19	2.7	ng/L		08/04/18 08:24	08/08/18 06:00	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L		08/04/18 08:24	08/08/18 06:00	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.3	ng/L		08/04/18 08:24	08/08/18 06:00	1
Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	1.8	ng/L		08/04/18 08:24	08/08/18 06:00	1
Perfluorobutanesulfonic acid (PFBS)	35	U	86	15	ng/L		08/04/18 08:24	08/08/18 06:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	85		70 - 130	08/04/18 08:24	08/08/18 06:00	1
13C2 PFDA	92		70 - 130	08/04/18 08:24	08/08/18 06:00	1

Default Detection Limits

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

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

Prep: 537

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

Surrogate Summary

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

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

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		PFHxA (70-130)	PFDA (70-130)
320-41679-1	WGNA-073118-RW-3785	88	103
320-41679-1 MS	WGNA-073118-RW-3785	90	98
320-41679-1 MSD	WGNA-073118-RW-3785	86	99
320-41679-2	WGNA-073118-FRB-3785	86	97
320-41679-3	NAWC-073118-RW-154	80	94
320-41679-4	NAWC-073118-FRB-154	86	98
320-41679-5	NAWC-073118-RW-185	81	94
320-41679-6	NAWC-073118-FRB-185	98	103
320-41679-7	NAWC-073118-RW-179	87	101
320-41679-8	NAWC-073118-FRB-179	87	101
320-41679-9	NAWC-073118-RW-124	83	94
320-41679-10	NAWC-073118-FRB-124	87	91
320-41679-11	WGNA-073118-RW-3103	90	99
320-41679-12	WGNA-073118-FRB-3103	85	92
LCS 320-237969/2-A	Lab Control Sample	88	94
MB 320-237969/1-A	Method Blank	90	95

Surrogate Legend

PFHxA = 13C2 PFHxA

PFDA = 13C2 PFDA

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

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

Lab Sample ID: MB 320-237969/1-A
Matrix: Water
Analysis Batch: 238610

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 237969

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		08/04/18 08:24	08/08/18 04:40	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		08/04/18 08:24	08/08/18 04:40	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		08/04/18 08:24	08/08/18 04:40	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		08/04/18 08:24	08/08/18 04:40	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		08/04/18 08:24	08/08/18 04:40	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		08/04/18 08:24	08/08/18 04:40	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFHxA	90		70 - 130	08/04/18 08:24	08/08/18 04:40	1
13C2 PFDA	95		70 - 130	08/04/18 08:24	08/08/18 04:40	1

Lab Sample ID: LCS 320-237969/2-A
Matrix: Water
Analysis Batch: 238610

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 237969

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA)	66.0	68.3		ng/L		103	70 - 130
Perfluorononanoic acid (PFNA)	66.0	64.4		ng/L		98	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	100	107		ng/L		107	70 - 130
Perfluoroheptanoic acid (PFHpA)	32.0	32.1		ng/L		100	70 - 130
Perfluorobutanesulfonic acid (PFBS)	300	321		ng/L		107	70 - 130

Surrogate	LCS	LCS	Limits
	%Recovery	Qualifier	
13C2 PFHxA	88		70 - 130
13C2 PFDA	94		70 - 130

Lab Sample ID: 320-41679-1 MS
Matrix: Water
Analysis Batch: 238610

Client Sample ID: WGNA-073118-RW-3785
Prep Type: Total/NA
Prep Batch: 237969

Analyte	Sample	Sample	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
	Result	Qualifier							
Perfluorooctanesulfonic acid (PFOS)	11	J	131	146		ng/L		103	70 - 130
Perfluorooctanoic acid (PFOA)	16	J	65.8	79.2		ng/L		97	70 - 130
Perfluorononanoic acid (PFNA)	21	U	65.8	64.8		ng/L		99	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	15	J	99.8	118		ng/L		103	70 - 130
Perfluoroheptanoic acid (PFHpA)	5.9	J	31.9	34.3		ng/L		89	70 - 130
Perfluorobutanesulfonic acid (PFBS)	37	U	299	325		ng/L		109	70 - 130

Surrogate	MS	MS	Limits
	%Recovery	Qualifier	
13C2 PFHxA	90		70 - 130
13C2 PFDA	98		70 - 130

TestAmerica Sacramento

QC Association Summary

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

LCMS

Prep Batch: 237969

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41679-1	WGNA-073118-RW-3785	Total/NA	Water	537	
320-41679-2	WGNA-073118-FRB-3785	Total/NA	Water	537	
320-41679-3	NAWC-073118-RW-154	Total/NA	Water	537	
320-41679-4	NAWC-073118-FRB-154	Total/NA	Water	537	
320-41679-5	NAWC-073118-RW-185	Total/NA	Water	537	
320-41679-6	NAWC-073118-FRB-185	Total/NA	Water	537	
320-41679-7	NAWC-073118-RW-179	Total/NA	Water	537	
320-41679-8	NAWC-073118-FRB-179	Total/NA	Water	537	
320-41679-9	NAWC-073118-RW-124	Total/NA	Water	537	
320-41679-10	NAWC-073118-FRB-124	Total/NA	Water	537	
320-41679-11	WGNA-073118-RW-3103	Total/NA	Water	537	
320-41679-12	WGNA-073118-FRB-3103	Total/NA	Water	537	
MB 320-237969/1-A	Method Blank	Total/NA	Water	537	
LCS 320-237969/2-A	Lab Control Sample	Total/NA	Water	537	
320-41679-1 MS	WGNA-073118-RW-3785	Total/NA	Water	537	
320-41679-1 MSD	WGNA-073118-RW-3785	Total/NA	Water	537	

Analysis Batch: 238610

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41679-1	WGNA-073118-RW-3785	Total/NA	Water	537	237969
320-41679-2	WGNA-073118-FRB-3785	Total/NA	Water	537	237969
320-41679-3	NAWC-073118-RW-154	Total/NA	Water	537	237969
320-41679-4	NAWC-073118-FRB-154	Total/NA	Water	537	237969
320-41679-5	NAWC-073118-RW-185	Total/NA	Water	537	237969
320-41679-6	NAWC-073118-FRB-185	Total/NA	Water	537	237969
MB 320-237969/1-A	Method Blank	Total/NA	Water	537	237969
LCS 320-237969/2-A	Lab Control Sample	Total/NA	Water	537	237969
320-41679-1 MS	WGNA-073118-RW-3785	Total/NA	Water	537	237969
320-41679-1 MSD	WGNA-073118-RW-3785	Total/NA	Water	537	237969

Analysis Batch: 238612

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41679-7	NAWC-073118-RW-179	Total/NA	Water	537	237969
320-41679-8	NAWC-073118-FRB-179	Total/NA	Water	537	237969
320-41679-9	NAWC-073118-RW-124	Total/NA	Water	537	237969
320-41679-10	NAWC-073118-FRB-124	Total/NA	Water	537	237969
320-41679-11	WGNA-073118-RW-3103	Total/NA	Water	537	237969
320-41679-12	WGNA-073118-FRB-3103	Total/NA	Water	537	237969

Lab Chronicle

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

Client Sample ID: WGNA-073118-RW-3785

Date Collected: 07/31/18 08:40

Date Received: 08/01/18 09:45

Lab Sample ID: 320-41679-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237969	08/04/18 08:24	SK	TAL SAC
Total/NA	Analysis	537		1	238610	08/08/18 04:50	JRB	TAL SAC

Client Sample ID: WGNA-073118-FRB-3785

Date Collected: 07/31/18 08:35

Date Received: 08/01/18 09:45

Lab Sample ID: 320-41679-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237969	08/04/18 08:24	SK	TAL SAC
Total/NA	Analysis	537		1	238610	08/08/18 05:04	JRB	TAL SAC

Client Sample ID: NAWC-073118-RW-154

Date Collected: 07/31/18 10:10

Date Received: 08/01/18 09:45

Lab Sample ID: 320-41679-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237969	08/04/18 08:24	SK	TAL SAC
Total/NA	Analysis	537		1	238610	08/08/18 05:09	JRB	TAL SAC

Client Sample ID: NAWC-073118-FRB-154

Date Collected: 07/31/18 10:05

Date Received: 08/01/18 09:45

Lab Sample ID: 320-41679-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237969	08/04/18 08:24	SK	TAL SAC
Total/NA	Analysis	537		1	238610	08/08/18 05:13	JRB	TAL SAC

Client Sample ID: NAWC-073118-RW-185

Date Collected: 07/31/18 11:10

Date Received: 08/01/18 09:45

Lab Sample ID: 320-41679-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237969	08/04/18 08:24	SK	TAL SAC
Total/NA	Analysis	537		1	238610	08/08/18 05:18	JRB	TAL SAC

Client Sample ID: NAWC-073118-FRB-185

Date Collected: 07/31/18 11:05

Date Received: 08/01/18 09:45

Lab Sample ID: 320-41679-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237969	08/04/18 08:24	SK	TAL SAC
Total/NA	Analysis	537		1	238610	08/08/18 05:23	JRB	TAL SAC

TestAmerica Sacramento

Lab Chronicle

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

Client Sample ID: NAWC-073118-RW-179

Lab Sample ID: 320-41679-7

Date Collected: 07/31/18 12:10

Matrix: Water

Date Received: 08/01/18 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237969	08/04/18 08:24	SK	TAL SAC
Total/NA	Analysis	537		1	238612	08/08/18 05:37	JRB	TAL SAC

Client Sample ID: NAWC-073118-FRB-179

Lab Sample ID: 320-41679-8

Date Collected: 07/31/18 12:05

Matrix: Water

Date Received: 08/01/18 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237969	08/04/18 08:24	SK	TAL SAC
Total/NA	Analysis	537		1	238612	08/08/18 05:41	JRB	TAL SAC

Client Sample ID: NAWC-073118-RW-124

Lab Sample ID: 320-41679-9

Date Collected: 07/31/18 12:40

Matrix: Water

Date Received: 08/01/18 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237969	08/04/18 08:24	SK	TAL SAC
Total/NA	Analysis	537		1	238612	08/08/18 05:46	JRB	TAL SAC

Client Sample ID: NAWC-073118-FRB-124

Lab Sample ID: 320-41679-10

Date Collected: 07/31/18 12:35

Matrix: Water

Date Received: 08/01/18 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237969	08/04/18 08:24	SK	TAL SAC
Total/NA	Analysis	537		1	238612	08/08/18 05:51	JRB	TAL SAC

Client Sample ID: WGNA-073118-RW-3103

Lab Sample ID: 320-41679-11

Date Collected: 07/31/18 13:40

Matrix: Water

Date Received: 08/01/18 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237969	08/04/18 08:24	SK	TAL SAC
Total/NA	Analysis	537		1	238612	08/08/18 05:55	JRB	TAL SAC

Client Sample ID: WGNA-073118-FRB-3103

Lab Sample ID: 320-41679-12

Date Collected: 07/31/18 13:35

Matrix: Water

Date Received: 08/01/18 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237969	08/04/18 08:24	SK	TAL SAC
Total/NA	Analysis	537		1	238612	08/08/18 06:00	JRB	TAL SAC

TestAmerica Sacramento

Lab Chronicle

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

Laboratory References:

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

Accreditation/Certification Summary

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD ELAP		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	10-31-18
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

Method Summary

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

Method	Method Description	Protocol	Laboratory
537	Perfluorinated Alkyl Acids (LC/MS)	EPA	TAL SAC
537	Extraction of Perfluorinated Alkyl Acids	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.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-41679-1	WGNA-073118-RW-3785	Water	07/31/18 08:40	08/01/18 09:45
320-41679-2	WGNA-073118-FRB-3785	Water	07/31/18 08:35	08/01/18 09:45
320-41679-3	NAWC-073118-RW-154	Water	07/31/18 10:10	08/01/18 09:45
320-41679-4	NAWC-073118-FRB-154	Water	07/31/18 10:05	08/01/18 09:45
320-41679-5	NAWC-073118-RW-185	Water	07/31/18 11:10	08/01/18 09:45
320-41679-6	NAWC-073118-FRB-185	Water	07/31/18 11:05	08/01/18 09:45
320-41679-7	NAWC-073118-RW-179	Water	07/31/18 12:10	08/01/18 09:45
320-41679-8	NAWC-073118-FRB-179	Water	07/31/18 12:05	08/01/18 09:45
320-41679-9	NAWC-073118-RW-124	Water	07/31/18 12:40	08/01/18 09:45
320-41679-10	NAWC-073118-FRB-124	Water	07/31/18 12:35	08/01/18 09:45
320-41679-11	WGNA-073118-RW-3103	Water	07/31/18 13:40	08/01/18 09:45
320-41679-12	WGNA-073118-FRB-3103	Water	07/31/18 13:35	08/01/18 09:45

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 238612

Lab Sample ID: 320-41679-11 Client Sample ID: WGNA-073118-RW-3103

Date Analyzed: 08/08/18 05:55 Lab File ID: 2018.08.07_537C_039.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.34	Peak assignment corrected	barnettj	08/08/18 13:47
Perfluoroheptanoic acid (PFHpA)	1.59	Missed Peak	barnettj	08/08/18 13:47

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41679-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-ICV_00032	08/15/18	06/23/18	MeOH/H2O, Lot 197626	10 mL	LC537-IS_00074	1000 uL	13C2-PFOA	10 ng/mL
.LC537-IS_00074	12/16/18	06/16/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C4 PFOS	28.68 ng/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			LCMPFOS_00024	180 uL	13C2-PFOA	0.1 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	0.2868 ug/mL
LC537-ICV_00032	08/15/18	06/23/18	MeOH/H2O, Lot 197626	10 mL	LC537-SU_00072	1000 uL	13C2-PFOA	50 ug/mL
.LC537-SU_00072	12/16/18	06/16/18	Methanol, Lot 104453	30000 uL	LC537ICIM2_00001	400 uL	13C2 PFDA	47.8 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916					13C2 PFDA	10 ng/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116					13C2 PFHxA	10 ng/mL
.LC537ICIM2_00001	08/15/18	02/15/18	Methanol, Lot 090285	10 mL	LC537ICIM_00020	0.5 mL	Perfluorobutanesulfonic acid (PFBS)	100.092 ng/mL
..LC537ICIM_00020	08/15/18	02/15/18	Methanol, Lot 090285	25 mL			Perfluoroheptanoic acid (PFHpA)	10 ng/mL
... <td>08/15/18</td> <td>02/15/18</td> <td>Methanol, Lot 090285</td> <td>17.1 mL</td> <td>LC537-PFBS2_00009</td> <td>0.625 mL</td> <td>Perfluorohexanesulfonic acid (PFHxS)</td> <td>20.1619 ng/mL</td>	08/15/18	02/15/18	Methanol, Lot 090285	17.1 mL	LC537-PFBS2_00009	0.625 mL	Perfluorohexanesulfonic acid (PFHxS)	20.1619 ng/mL
....LC537_PFBS2_00002	09/08/22	Santa Cruz Biotechnology, Lot F0917					Perfluorononanoic acid (PFNA)	20.1641 ng/mL
							Perfluorooctanoic acid (PFOA)	20.167 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.1702 ng/mL
							13C2 PFDA	0.1 ug/mL
							13C2 PFHxA	0.1 ug/mL
							13C2 PFDA	50 ug/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
							Perfluorobutanesulfonic acid (PFBS)	50.0459 ug/mL
							Perfluoroheptanoic acid (PFHpA)	5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	10.0809 ug/mL
							Perfluorononanoic acid (PFNA)	10.0821 ug/mL
							Perfluorooctanoic acid (PFOA)	10.0835 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	10.0851 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	2001.84 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.998 g/g

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41679-1

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_00077	01/05/19	07/16/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
.LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-L1_00022	09/30/18	04/02/18	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00065	500 uL	13C2-PFOA	10 ng/mL
					LC537-MSP_00033	60 uL	13C4 PFOS	28.68 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	8.99912 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.96 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	3.003 ng/mL
							Perfluorononanoic acid (PFNA)	1.98 ng/mL
							Perfluorooctanoic acid (PFOA)	1.98 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	3.95328 ng/mL
					LC537-SU_00064	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-MSP_00033	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	509 uL	Perfluorobutanesulfonic acid (PFBS)	749.927 ng/mL
					LCPFHpA_00009	48 uL	Perfluoroheptanoic acid (PFHpA)	80 ng/mL
					LCPFHxS-br_00005	165 uL	Perfluorohexanesulfonic acid (PFHxS)	250.25 ng/mL
					LCPFNA_00009	99 uL	Perfluorononanoic acid (PFNA)	165 ng/mL
					LCPFOA_00010	99 uL	Perfluorooctanoic acid (PFOA)	165 ng/mL
					LCPFOS-br_00005	213 uL	Perfluorooctanesulfonic acid (PFOS)	329.44 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41679-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	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_00022	09/30/18	04/02/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00028	320 uL	Perfluorobutanesulfonic acid (PFBS)	20.0138 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.16 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	6.72187 ng/mL
							Perfluorononanoic acid (PFNA)	4.4 ng/mL
							Perfluorooctanoic acid (PFOA)	4.4 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	8.78507 ng/mL
					LC537-IS_00065	2 mL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00064	2 mL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41679-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
..LCM2PFOA_00010	02/12/21		Wellington Laboratories, Lot M2PFOA0216		LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL		
..LCMPFOS_00024	05/19/22		Wellington Laboratories, Lot MPFOS517		(Purchased Reagent)		13C2-PFOA	50 ug/mL		
..LC537-SU_00064	10/02/18	04/02/18	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		
..LCMPFHxA_00015	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFHxA	50 ug/mL		
LC537-L3_00025	09/30/18	04/02/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00028	720 uL	Perfluorobutanesulfonic acid (PFBS)	45.031 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	4.86 ng/mL		
							Perfluorohexanesulfonic acid (PFHxS)	15.1242 ng/mL		
							Perfluorononanoic acid (PFNA)	9.9 ng/mL		
							Perfluorooctanoic acid (PFOA)	9.9 ng/mL		
							Perfluorooctanesulfonic acid (PFOS)	19.7664 ng/mL		
					LC537-IS_00065	2 mL	13C2-PFOA	10 ng/mL		
LC537-SU_00064	2 mL	13C4 PFOS	28.68 ng/mL							
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL		
							LCPFHpA_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
							LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL
							LCPFNA_00009	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
							LCPFOA_00010	165 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL
							LCPFOS-br_00005	355 uL	Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL
..LCPFBSA_00002	12/02/21		Wellington Laboratories, Lot LPFBS1116		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL		
..LCPFHpA_00009	12/02/21		Wellington Laboratories, Lot PFHpA1216		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL		
..LCPFHxS-br_00005	01/04/22		Wellington Laboratories, Lot brPFHxSK0117		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL		
..LCPFNA_00009	07/20/22		Wellington Laboratories, Lot PFNA0717		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL		
..LCPFOA_00010	09/27/22		Wellington Laboratories, Lot PFOA0917		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL		
..LCPFOS-br_00005	01/12/22		Wellington Laboratories, Lot brPFOSK0117		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL		
..LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL		
..LCM2PFOA_00010	02/12/21		Wellington Laboratories, Lot M2PFOA0216		LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL		
..LCMPFOS_00024	05/19/22		Wellington Laboratories, Lot MPFOS517		(Purchased Reagent)		13C2-PFOA	50 ug/mL		
..LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	(Purchased Reagent)		13C4 PFOS	47.8 ug/mL		
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL		
..LCMPFHxA_00015	11/22/21		Wellington Laboratories, Lot MPFHxA1116		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		
..LCMPFHxA_00015	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFHxA	50 ug/mL		

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41679-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
LC537-L4_00022	09/30/18	04/02/18	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00028	360 uL	Perfluorobutanesulfonic acid (PFBS)	90.0619 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	9.72 ng/mL		
							Perfluorohexanesulfonic acid (PFHxS)	30.2484 ng/mL		
							Perfluorononanoic acid (PFNA)	19.8 ng/mL		
							Perfluorooctanoic acid (PFOA)	19.8 ng/mL		
							Perfluorooctanesulfonic acid (PFOS)	39.5328 ng/mL		
LC537-IS_00065						500 uL	13C2-PFOA	10 ng/mL		
							13C4 PFOS	28.68 ng/mL		
							13C2 PFDA	10 ng/mL		
LC537-SU_00064						500 uL	13C2 PFHxA	10 ng/mL		
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL		
							LCPFHpA_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
							LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL
							LCPFNA_00009	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
							LCPFOA_00010	165 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL
							LCPFOS-br_00005	355 uL	Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL		
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL		
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL		
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL		
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL		
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL		
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL		
							LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL		
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL		
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL		
							LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL		
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL		
LC537-L5_00026	09/30/18	04/02/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00028	2160 uL	Perfluorobutanesulfonic acid (PFBS)	135.093 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	14.58 ng/mL		
							Perfluorohexanesulfonic acid (PFHxS)	45.3726 ng/mL		
							Perfluorononanoic acid (PFNA)	29.7 ng/mL		

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41679-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanoic acid (PFOA)	29.7 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	59.2992 ng/mL
					LC537-IS_00065	2 mL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00064	2 mL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L6_00022	09/30/18	04/02/18	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00028	720 uL	Perfluorobutanesulfonic acid (PFBS)	180.124 ng/mL
							Perfluoroheptanoic acid (PFHpA)	19.44 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	60.4968 ng/mL
							Perfluorononanoic acid (PFNA)	39.6 ng/mL
							Perfluorooctanoic acid (PFOA)	39.6 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	79.0656 ng/mL
					LC537-IS_00065	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00064	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41679-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-MSP_00033	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	509 uL	Perfluorobutanesulfonic acid (PFBS)	749.927 ng/mL
					LCPFHpA_00009	48 uL	Perfluoroheptanoic acid (PFHpA)	80 ng/mL
					LCPFHxS-br_00005	165 uL	Perfluorohexane Sulfonate	250.25 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	250.25 ng/mL
					LCPFNA_00009	99 uL	Perfluorononanoic acid (PFNA)	165 ng/mL
					LCPFOA_00010	99 uL	Perfluorooctanoic acid (PFOA)	165 ng/mL
LCPFOS-br_00005	213 uL	Perfluorooctanesulfonic acid (PFOS)	329.44 ng/mL					
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117		(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL	
						Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL	
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

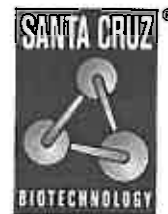
SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFOS-br_00005	01/12/22		Wellington Laboratories, Lot brPFOSK0117		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LC537-SU_00074	01/05/19	07/16/18	Methanol, Lot 104453	30000 uL	LCMPFDA 00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA 00015	60 uL	13C2 PFHxA	0.1 ug/mL
.LCMPFDA 00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFHxA 00015	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Reagent

LC537_PFB2_00002

P: 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_PFHpA2_00002

Certificate of analysis

R:6.13.17 SW

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

PFHpA

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

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Reagent

LC537_PFHxS2_00002

n: 6-E-17SKV

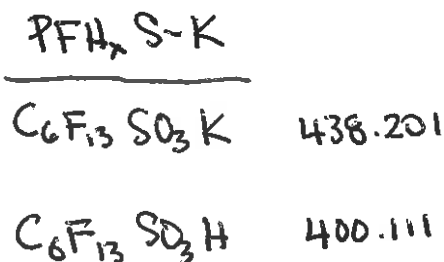


The Future is Custom

CERTIFICATE OF ANALYSIS

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

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



MW correction = $\frac{400.11}{438.201} = 0.91307$ PFH₂S
 cas# 355-46-4

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

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Reagent

LC537_PFN2_00002

P: 6.14.17 SKW

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

Certificate of Analysis

Product Name:
Perfluorononanoic acid - 97%

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



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

Michael Grady, Manager
Quality Control
Milwaukee, WI US

PFNA

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

Reagent

LC537_PFOA2_00002

Certificate of analysis

P: 6/9/17 

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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ThermoFisher
SCIENTIFIC

Reagent

LC537_PFOs2_00002

N: 6.14.17 SKV

Certificate of Analysis

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

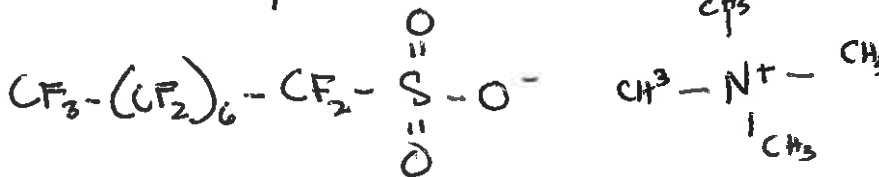
TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	WHITE TO OFF WHITE	OFF-WHITE
APPEARANCE (FORM)	POWDER OR POWDER WITH CHUNK(S)	POWDER
CARBON CONTENT	29.77 % - 31.29 %	29.97 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

Claudia Geitner

Dr. Claudia Geitner
 Manager Quality Control
 Buchs, Switzerland

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

Purity & MW correction = 77.87%



	$C_8 F_{17} SO_3^+ H$	$C_8 H_{20} N$
C = 12.011	96.088	96.088
F = 18.998	322.966	—
S = 32.066	32.066	—
O = 16.999	47.997	—
H = 1.008	1.008	20.160
N = 14.007	—	14.007
	<hr/>	<hr/>
	500.125	130.255

Reagent

LCM2PFOA_00010

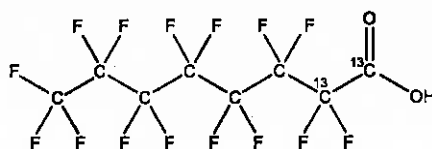


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₈HF₁₆O₂
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:

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:

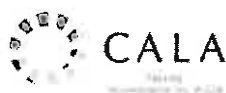
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

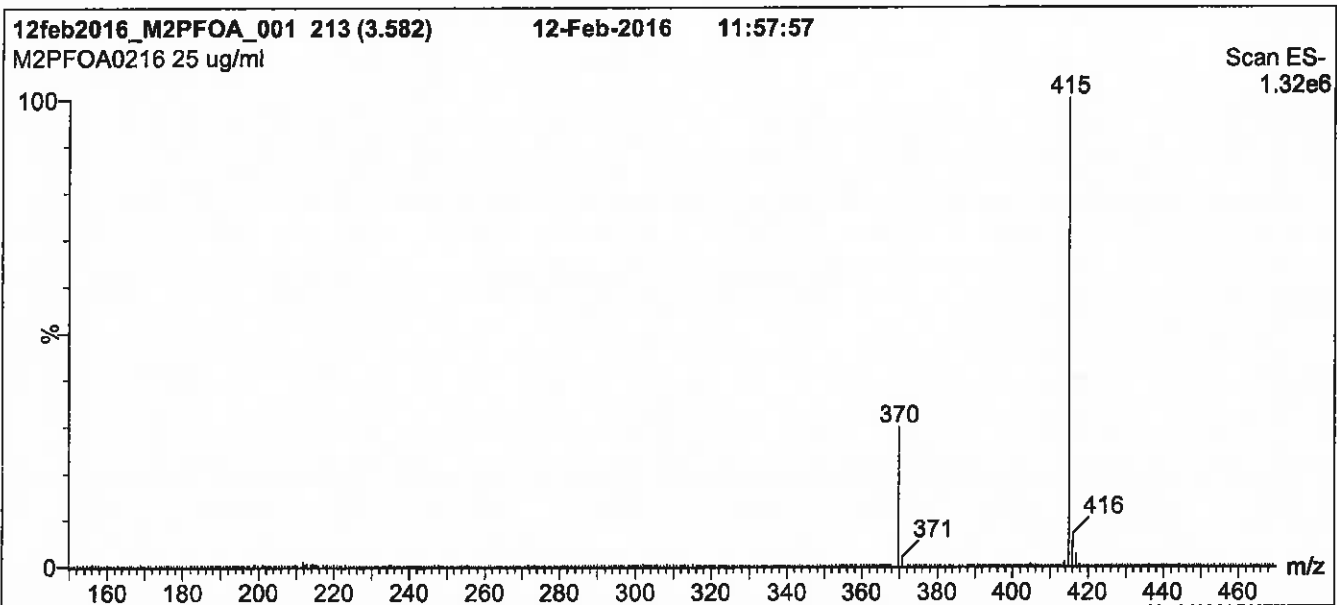
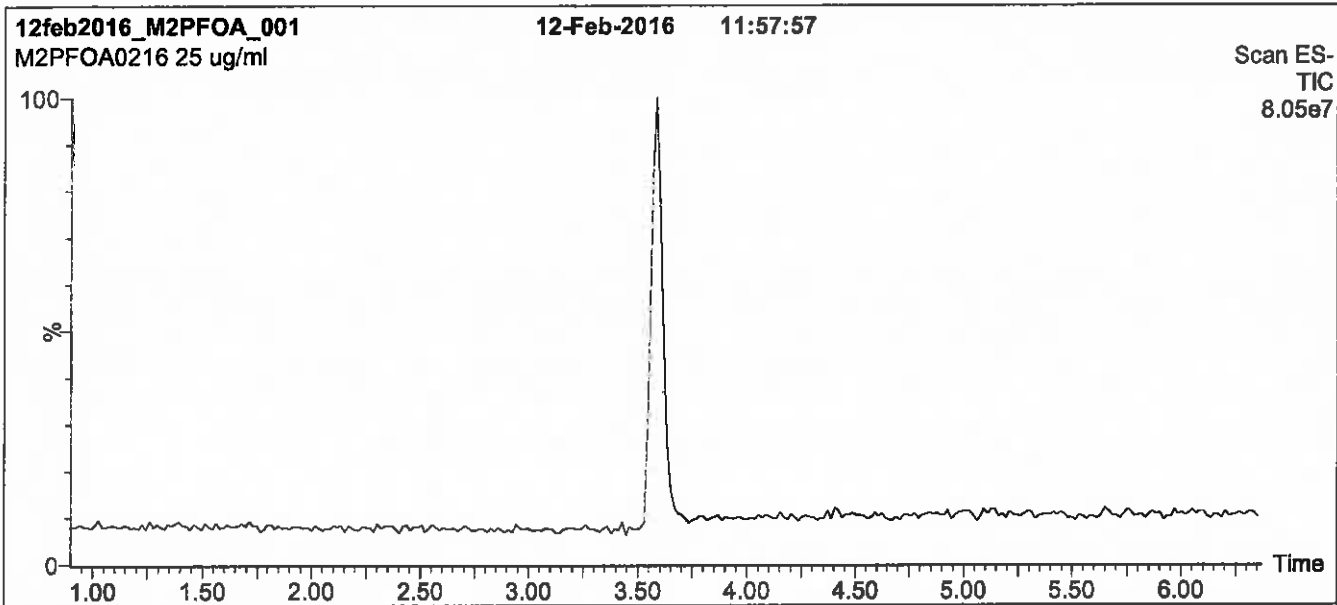
QUALITY MANAGEMENT:

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: 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

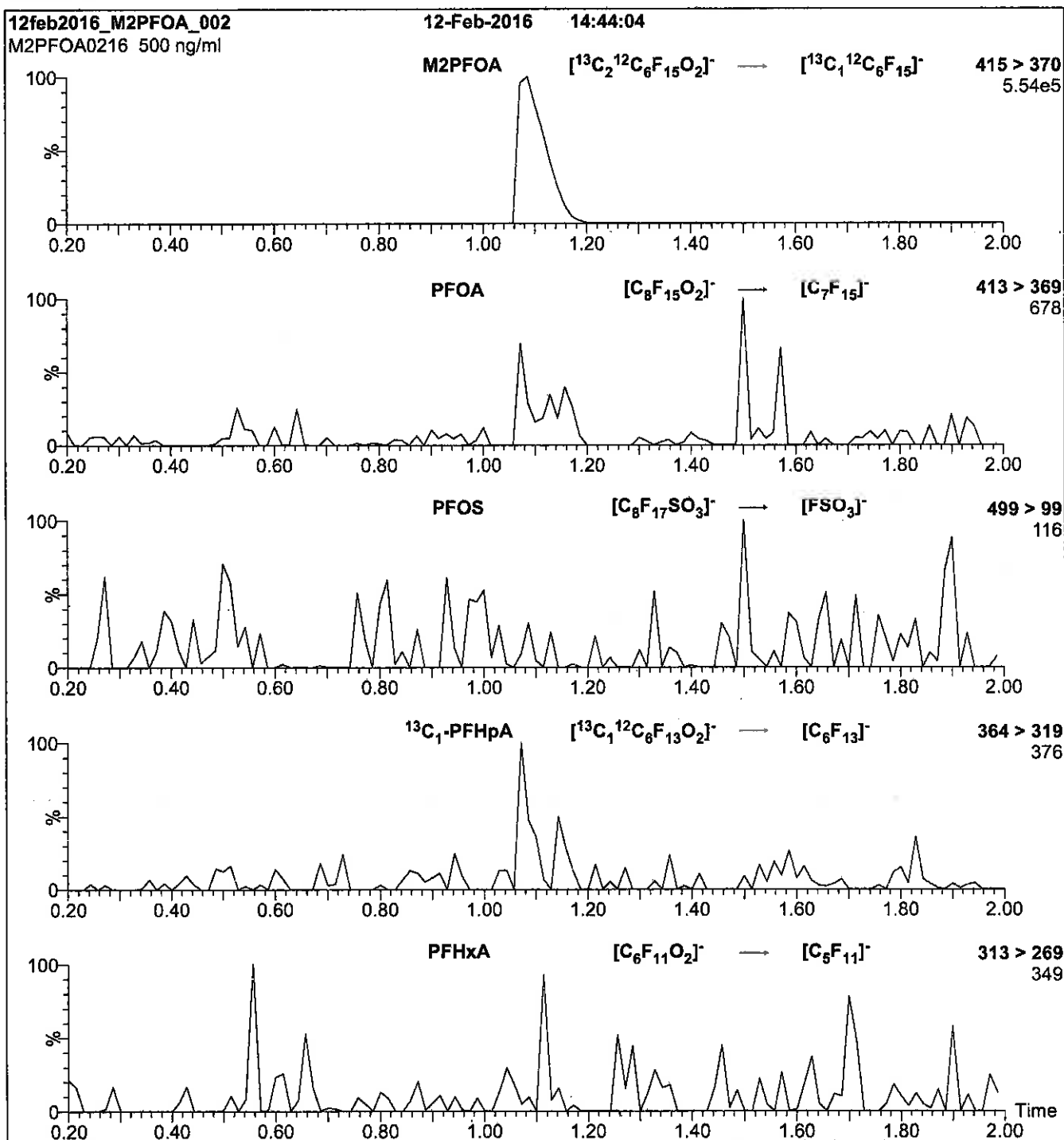
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

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 Prpd: SBC

13C2-Perfluorodecanoic a

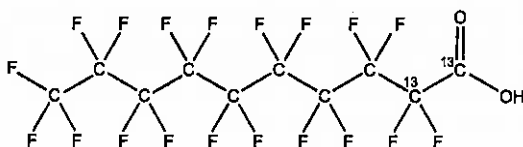


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE: CAS #: Not available



MOLECULAR FORMULA: 13C2 12C8 HF19 O2 MOLECULAR WEIGHT: 516.07
CONCENTRATION: 50 ± 2.5 µg/ml SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98% ISOTOPIC PURITY: ≥99% 13C (1,2-13C2)
LAST TESTED: (mm/dd/yyyy) 09/30/2016
EXPIRY DATE: (mm/dd/yyyy) 09/30/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
Contains < 0.1% of 13C1-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: [Signature] Date: 10/07/2016
B.G. Chrftim (mm/dd/yyyy)

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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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.

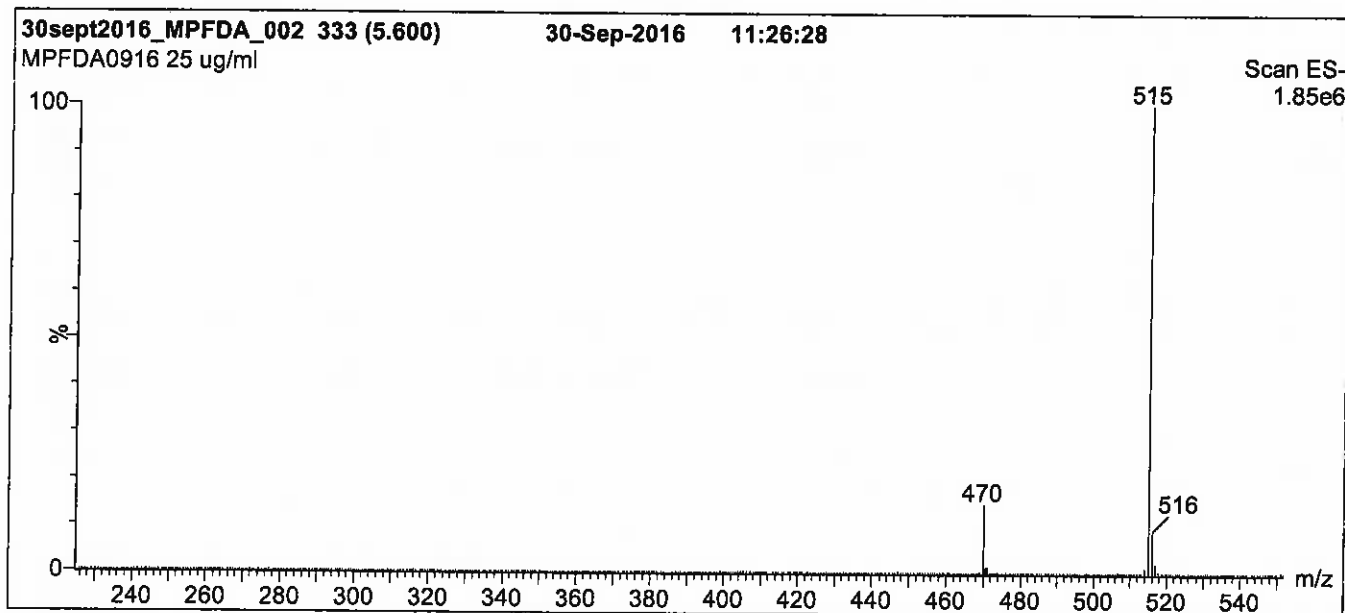
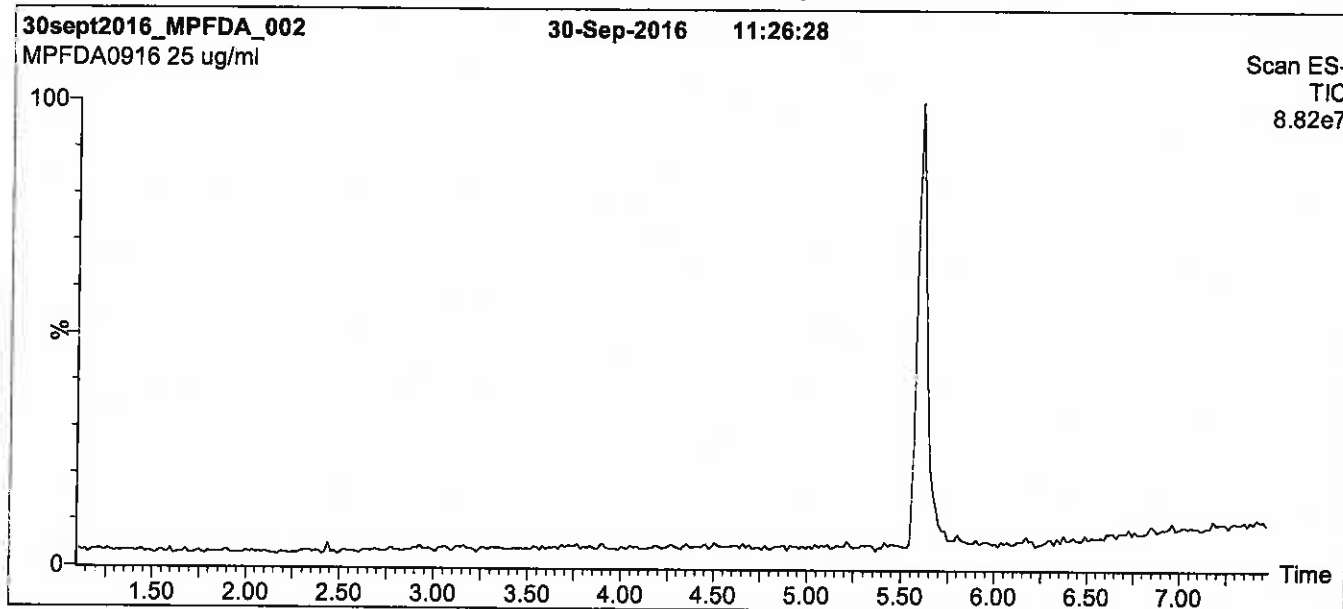
QUALITY MANAGEMENT:

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

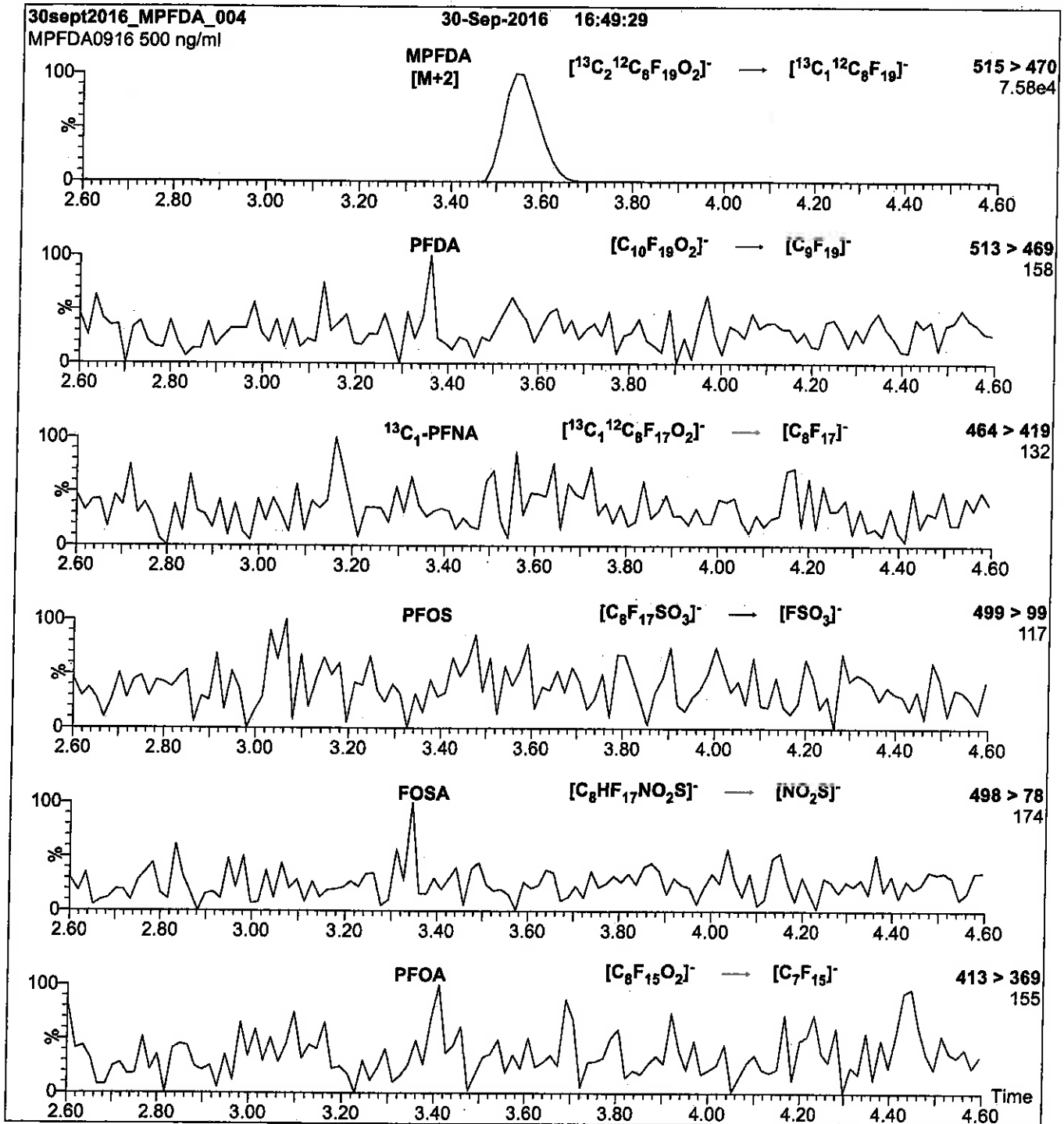
Flow: 300 μ l/min

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% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFHxA_00015

r: 5/17/17 SKJ

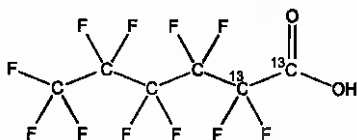


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxA **LOT NUMBER:** MPFHxA1116
COMPOUND: Perfluoro-n-[1,2-¹³C₂]hexanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₄HF₁₁O₂ **MOLECULAR WEIGHT:** 316.04
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99%¹³C
(1,2-¹³C₂)
LAST TESTED: (mm/dd/yyyy) 11/22/2016
EXPIRY DATE: (mm/dd/yyyy) 11/22/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

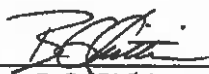
DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim **Date:** 12/13/2016
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

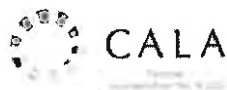
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

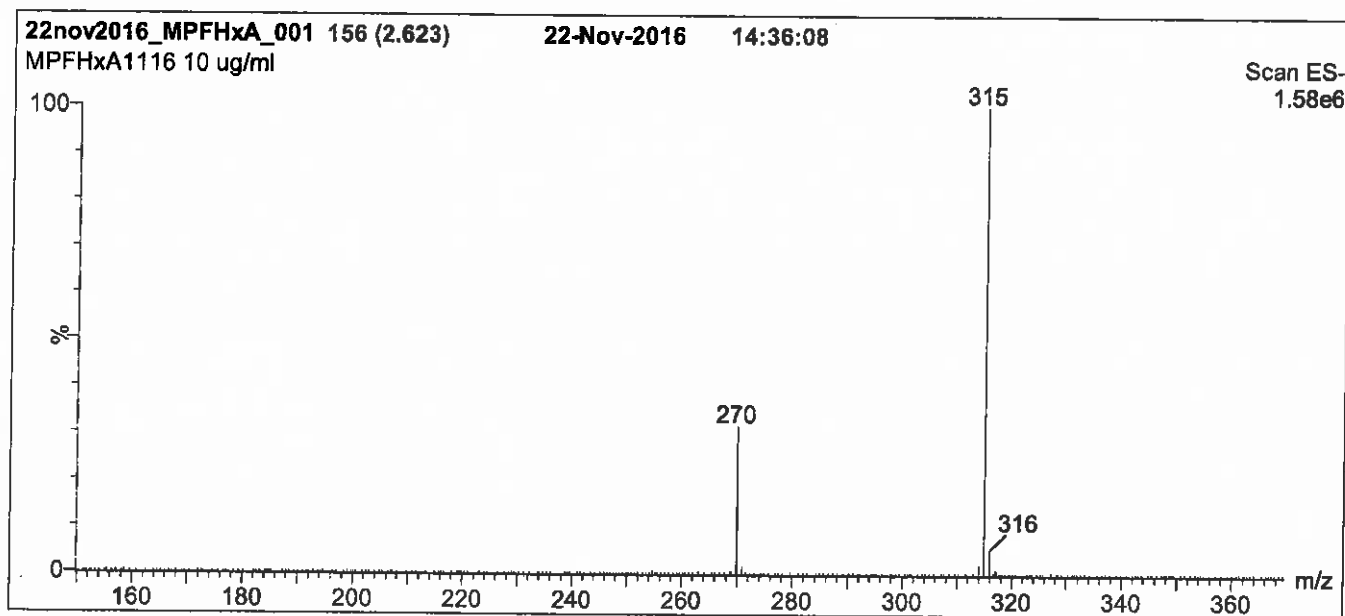
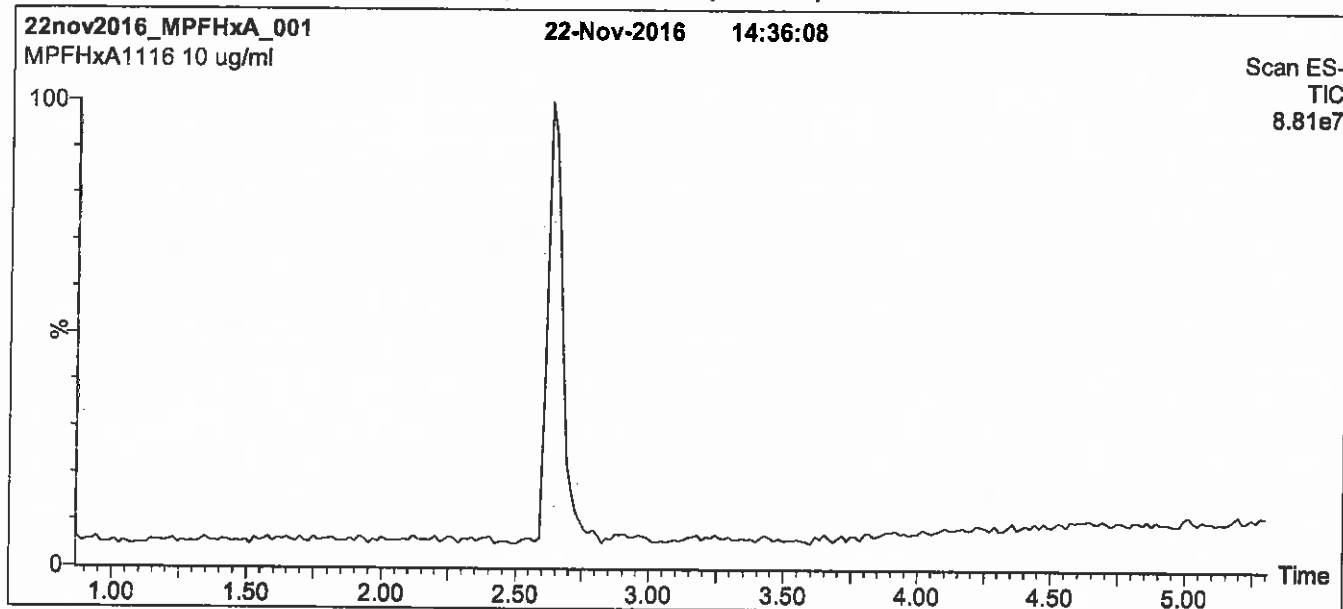
QUALITY MANAGEMENT:

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).



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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{ss}
1.7 μ m, 2.1 x 100 mm

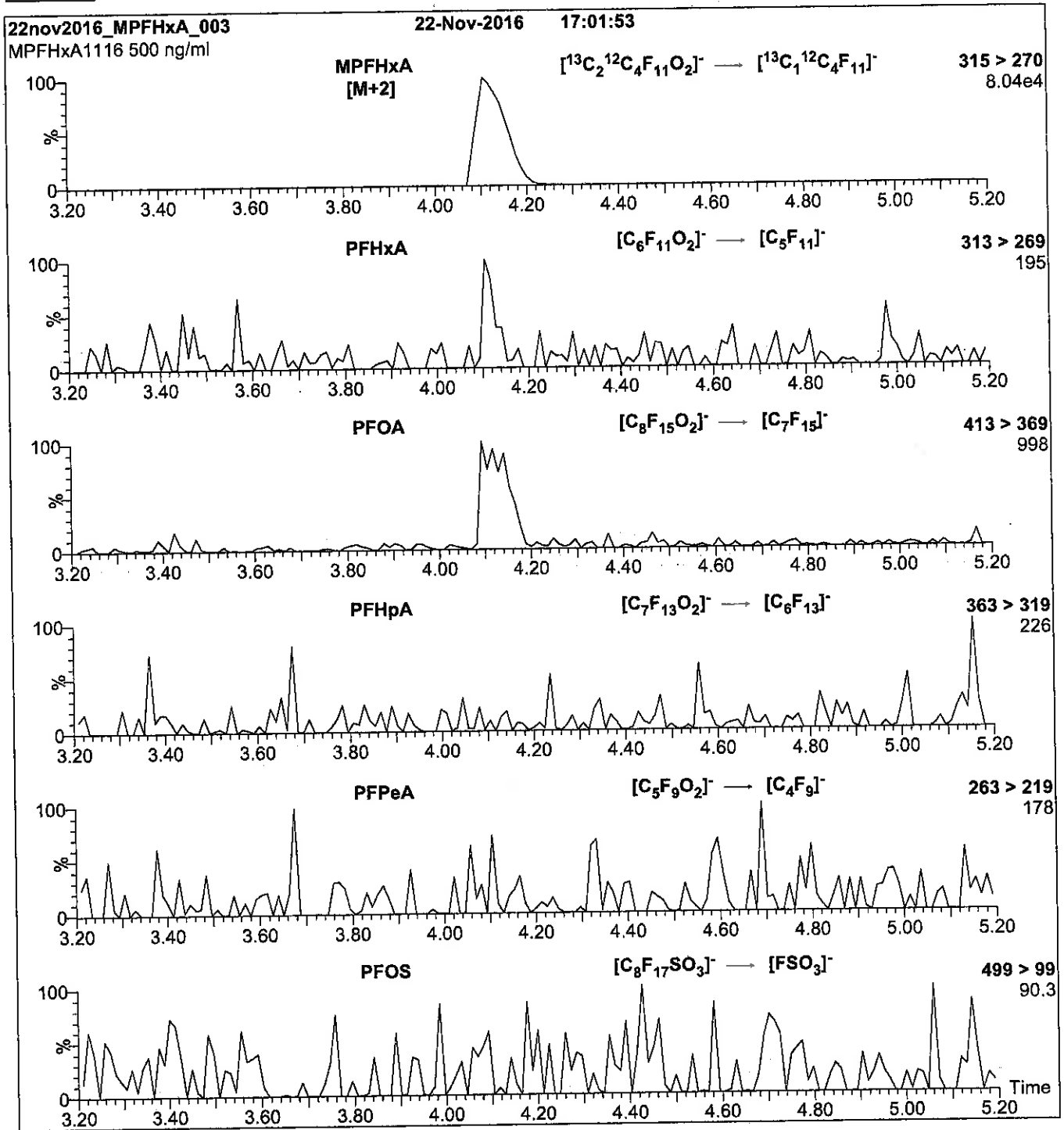
Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions over 0.5 min.
Time: 10 min

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_00024

r: skln skj



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFOS

LOT NUMBER:

MPFOS0517

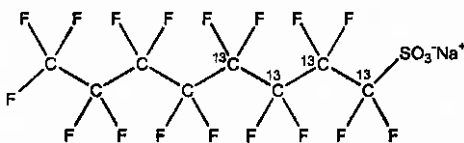
COMPOUND:

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)
47.8 ± 2.4 µg/ml (MPFOS anion)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C
(1,2,3,4-¹³C₄)

LAST TESTED: (mm/dd/yyyy)

05/19/2017

EXPIRY DATE: (mm/dd/yyyy)

05/19/2022

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
B.G. Chittim, General Manager

Date: 05/30/2017

(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. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

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 calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, 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.

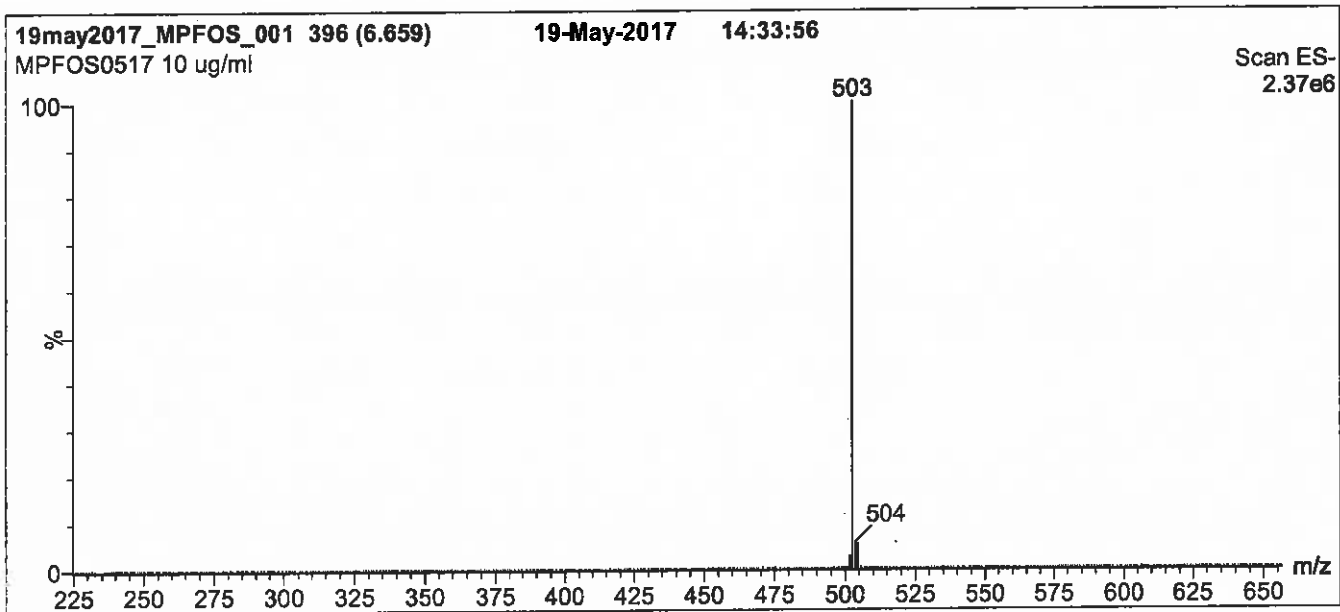
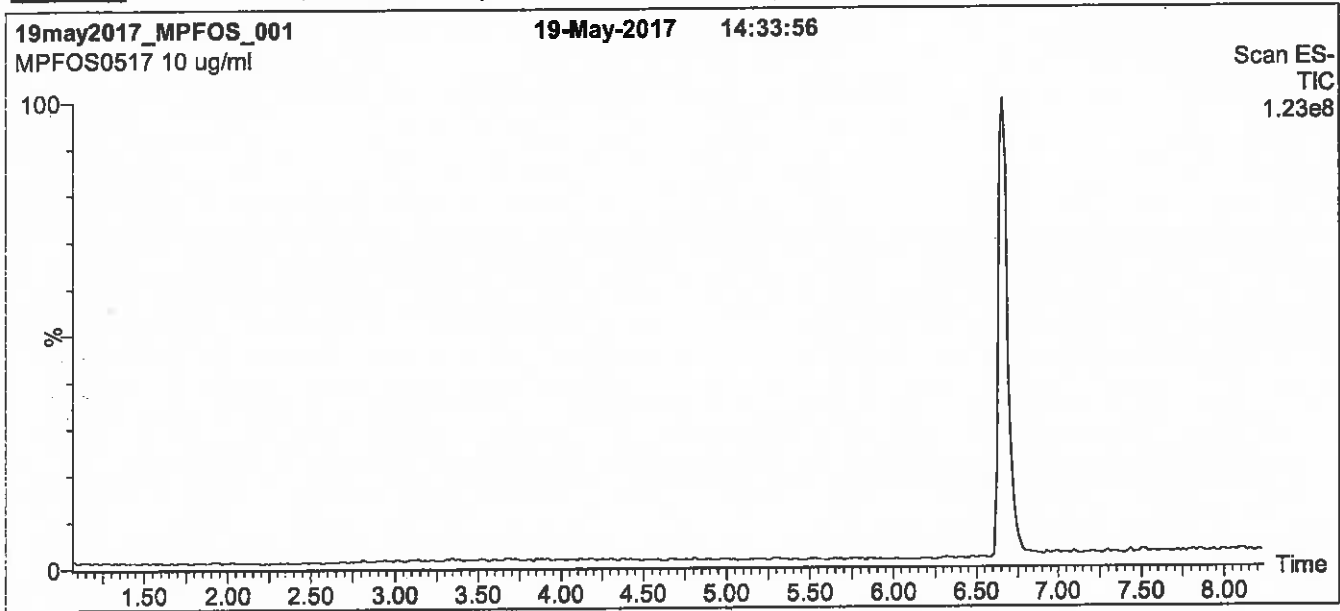
QUALITY MANAGEMENT:

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).



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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 μm, 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 8 min and hold for 1 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

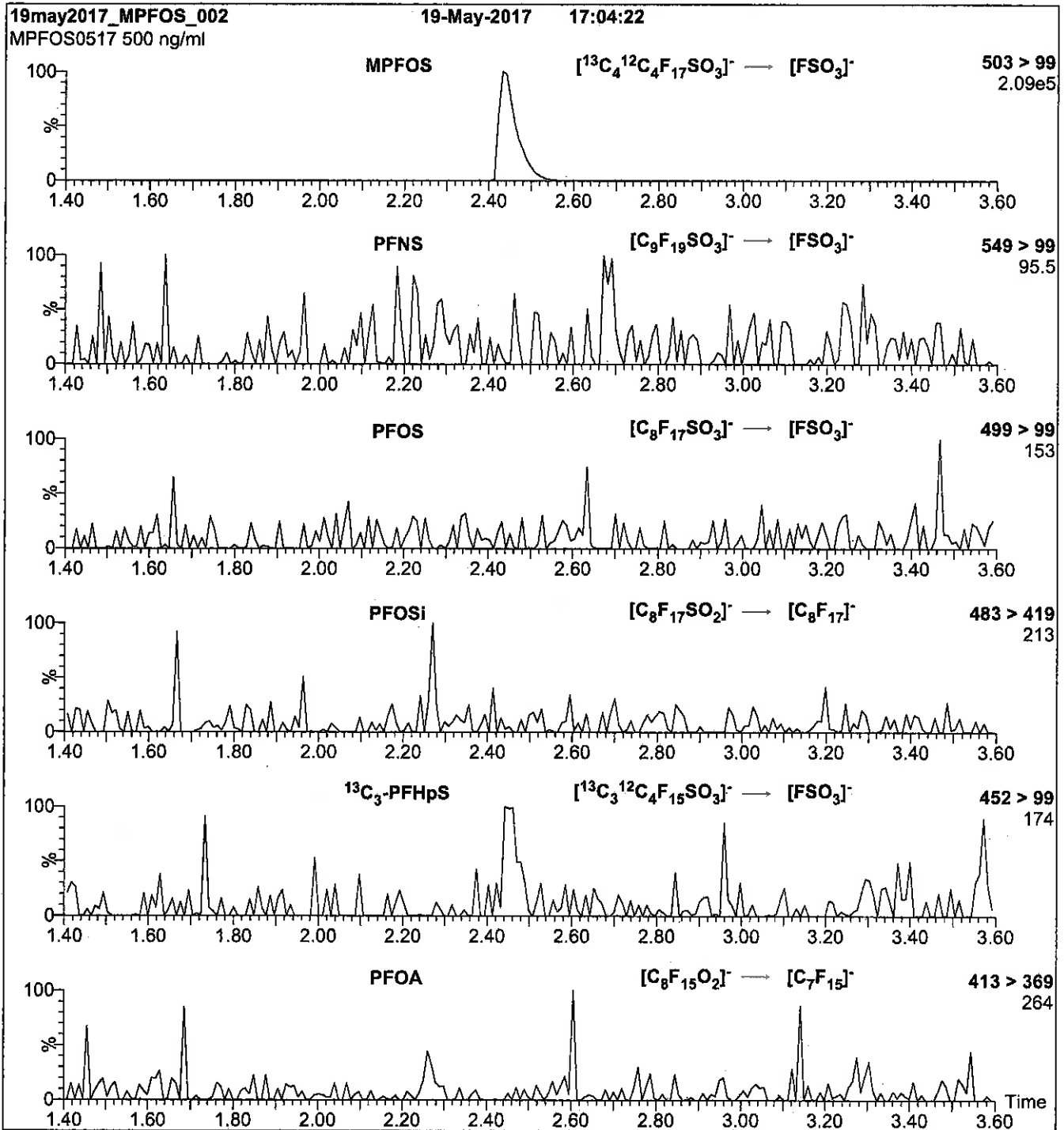
Flow: 300 μl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.31e-3
 Collision Energy (eV) = 40

Reagent

LCPFBSA_00002

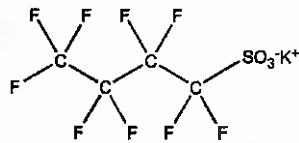
n: 12/17 SKW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFBS **LOT NUMBER:** LPFBS1116
COMPOUND: Potassium perfluoro-1-butanesulfonate
STRUCTURE: **CAS #:** 29420-49-3



MOLECULAR FORMULA: C₄F₉SO₃K **MOLECULAR WEIGHT:** 338.19
CONCENTRATION: 50.0 ± 2.5 µg/ml (K salt) **SOLVENT(S):** Methanol
44.2 ± 2.2 µg/ml (PFBS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/02/2016
EXPIRY DATE: (mm/dd/yyyy) 12/02/2021
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:  **Date:** 12/05/2016
B.G. Chittim (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.

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

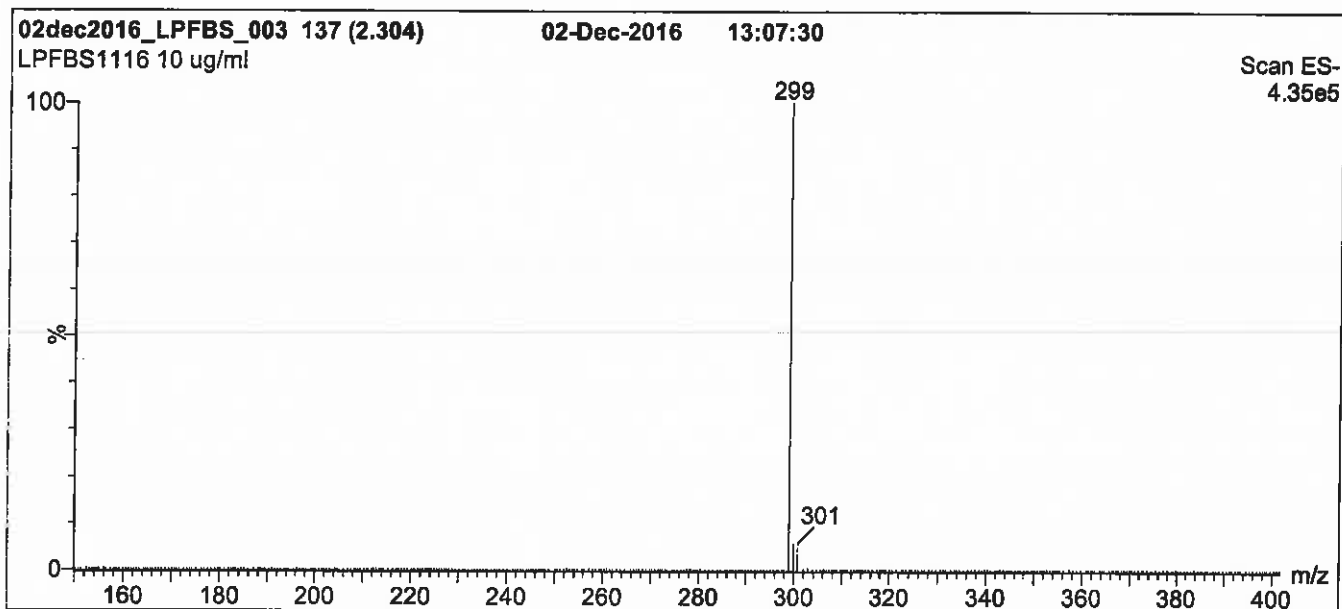
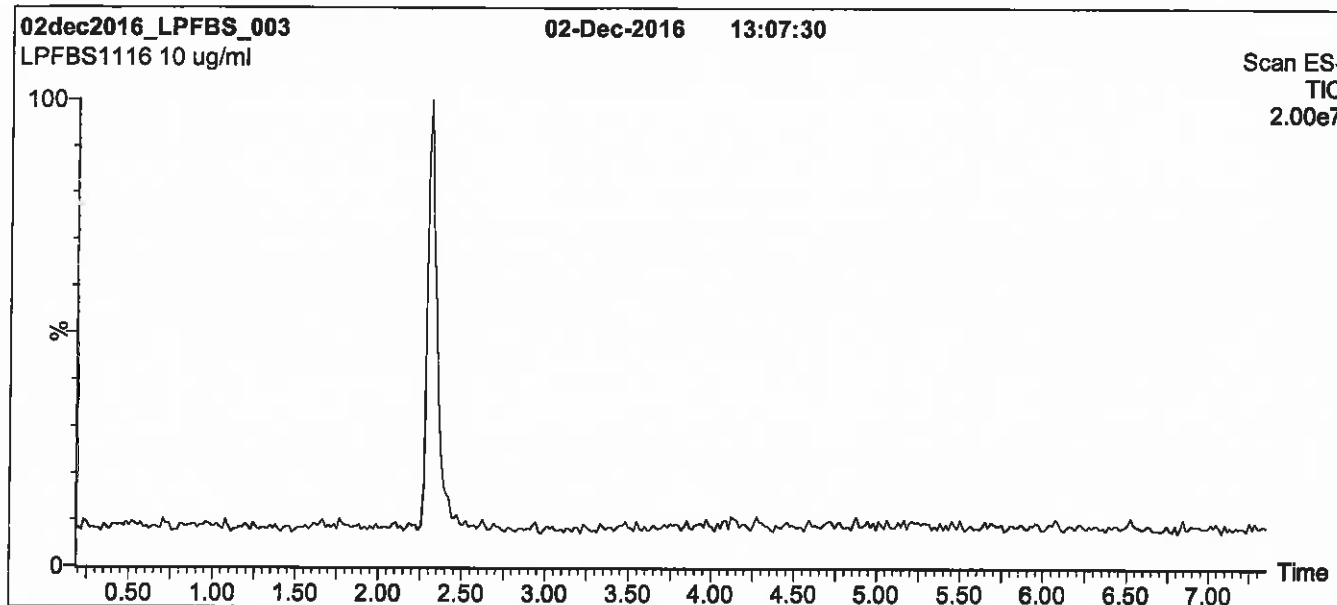
QUALITY MANAGEMENT:

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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: L-PFBS; 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 in 0.5 min.
Time: 10 min

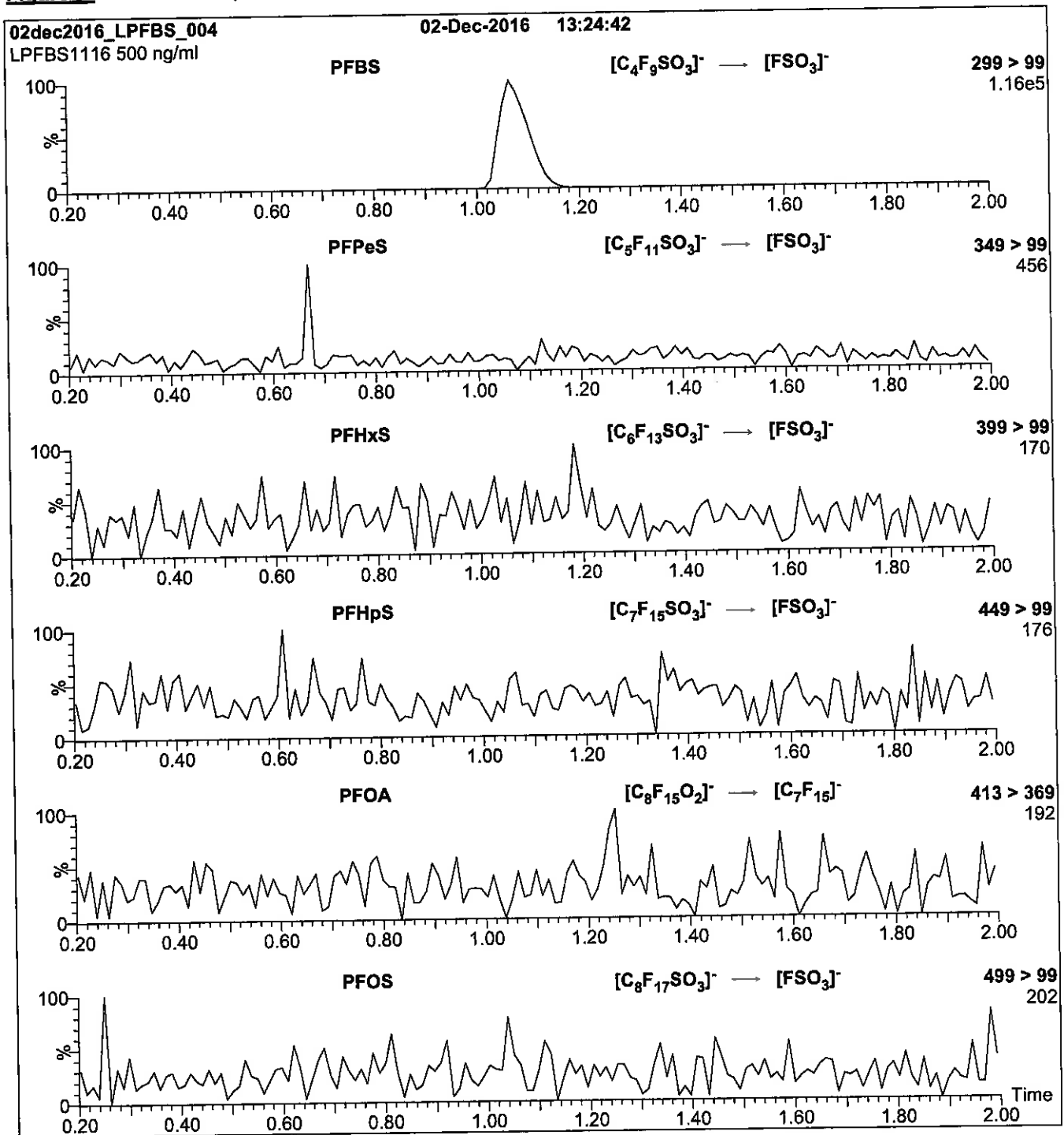
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
 10 μ l (500 ng/ml L-PFBS)

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) = 3.28e-3
 Collision Energy (eV) = 25

Reagent

LCPFHpA_00009

P: 9/21/17 SKJ

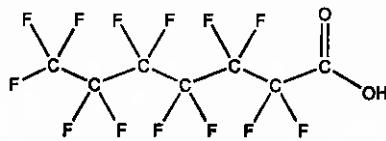


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHpA **LOT NUMBER:** PFHpA1216
COMPOUND: Perfluoro-n-heptanoic acid

STRUCTURE: **CAS #:** 375-85-9



MOLECULAR FORMULA: $C_7HF_{13}O_2$ **MOLECULAR WEIGHT:** 364.06
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/02/2016
EXPIRY DATE: (mm/dd/yyyy) 12/02/2021
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:** 12/12/2016
 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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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:

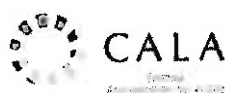
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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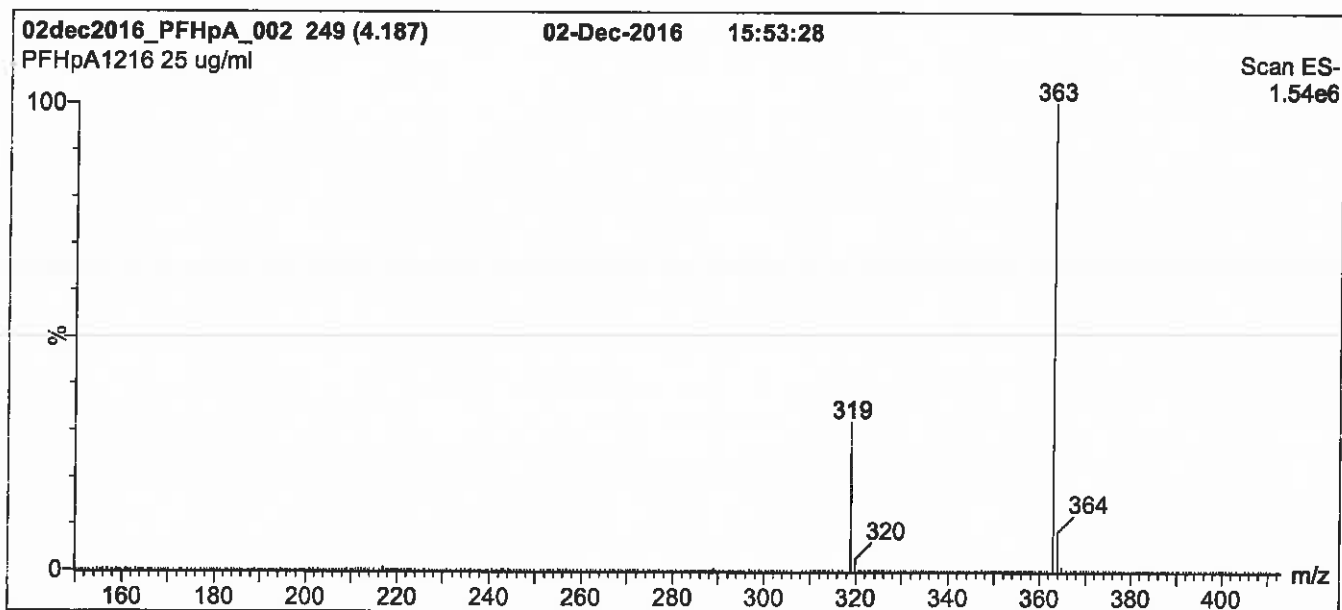
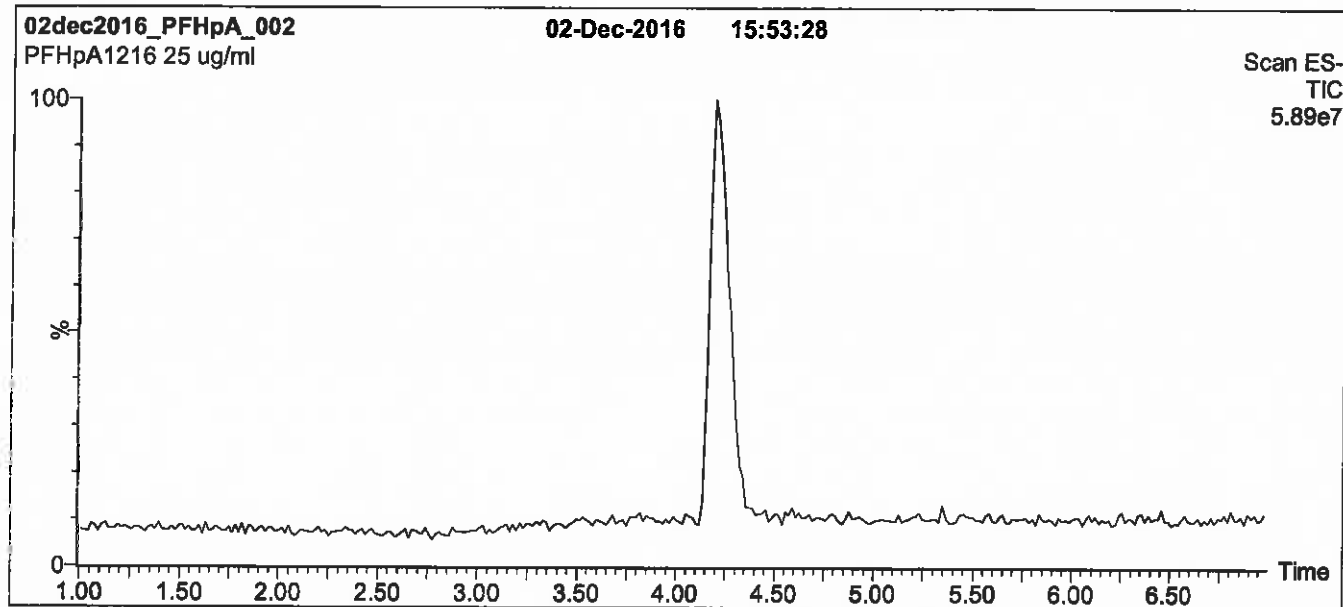
QUALITY MANAGEMENT:

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



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Figure 1: PFHpA; 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

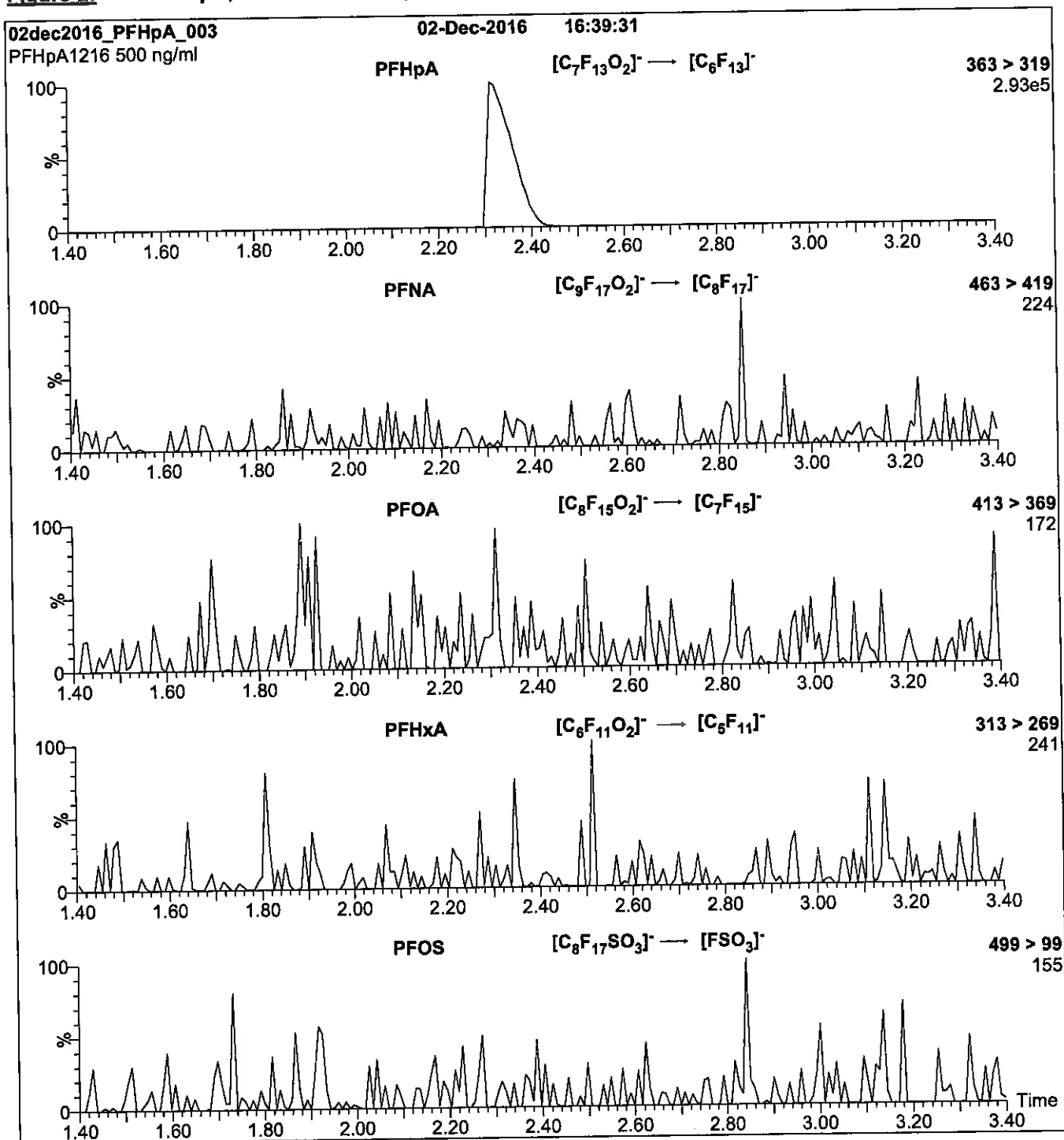
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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) = 3.50e-3
 Collision Energy (eV) = 11

Reagent

LCPFHxS-br_00005



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CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate
Solution/Mixture of Linear and
Branched Isomers

PRODUCT CODE: br-PFHxSK
LOT NUMBER: brPFHxSK0117
CONCENTRATION: 50.0 ± 2.5 µg/ml (total potassium salt)
 45.5 ± 2.3 µg/ml (total PFHxS anion)
SOLVENT(S): Methanol
DATE PREPARED: (mm/dd/yyyy) 01/03/2017
LAST TESTED: (mm/dd/yyyy) 01/04/2017
EXPIRY DATE: (mm/dd/yyyy) 01/04/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorohexanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ¹⁹F-NMR
 Figure 1: LC/MS Data (TIC and Mass Spectrum)
 Figure 2: LC/MS Data (SIR)
 Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

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Table A: br-PFHxSK; Isomeric Components and Percent Composition (by ¹⁹F-NMR)*

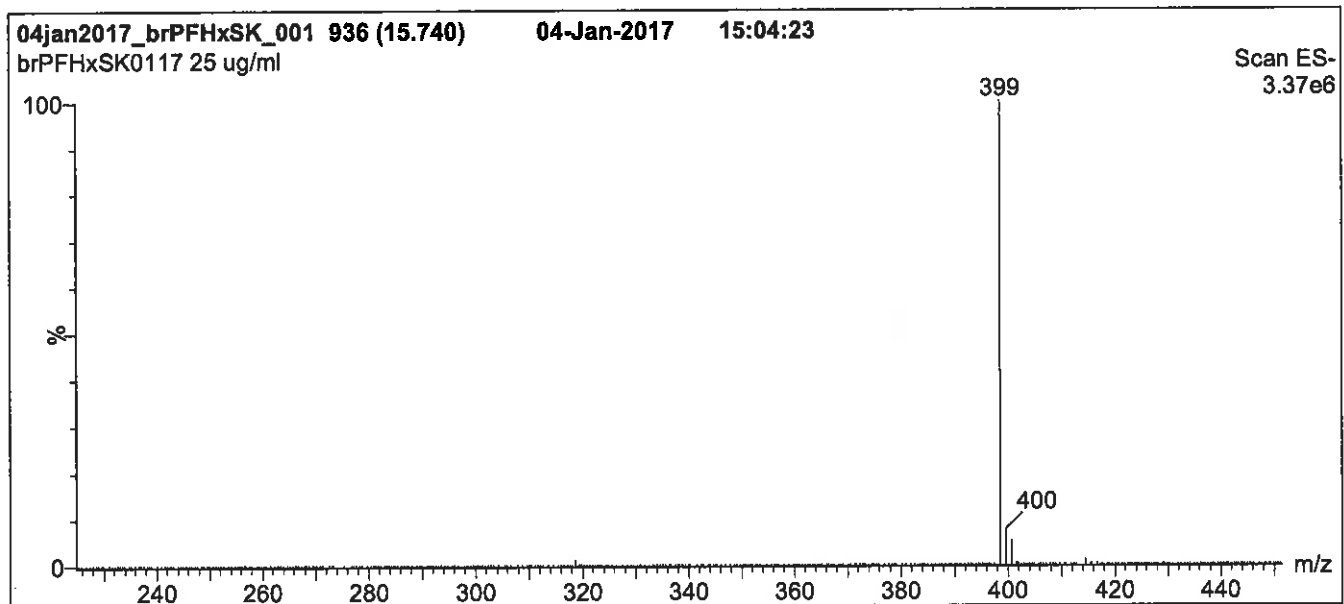
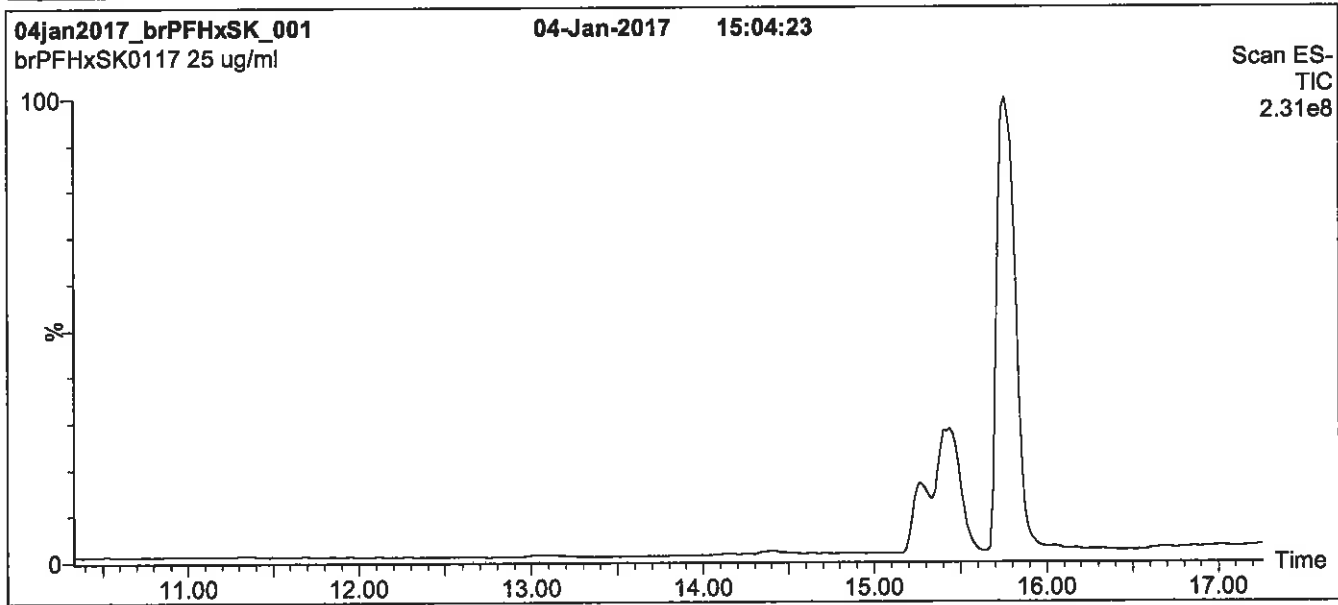
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF(SO ₃ ⁻)K ⁺ CF ₃	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CF(CF ₃)SO ₃ ⁻ K ⁺ CF ₃	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF(CF ₃)CF ₂ SO ₃ ⁻ K ⁺ CF ₃	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	CF ₃ CF(CF ₃)CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	CF ₃ CF ₃ CCF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.2
7	Other Unidentified Isomers		0.5

* Percent of total perfluorohexanesulfonate isomers only.
 ** Systematic Name: Potassium perfluorohexane-2-sulfonate.

Certified By: 
 B.G. Chittim

Date: 01/20/2017
 (mm/dd/yyyy)

Figure 1: br-PFHxSK; 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: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

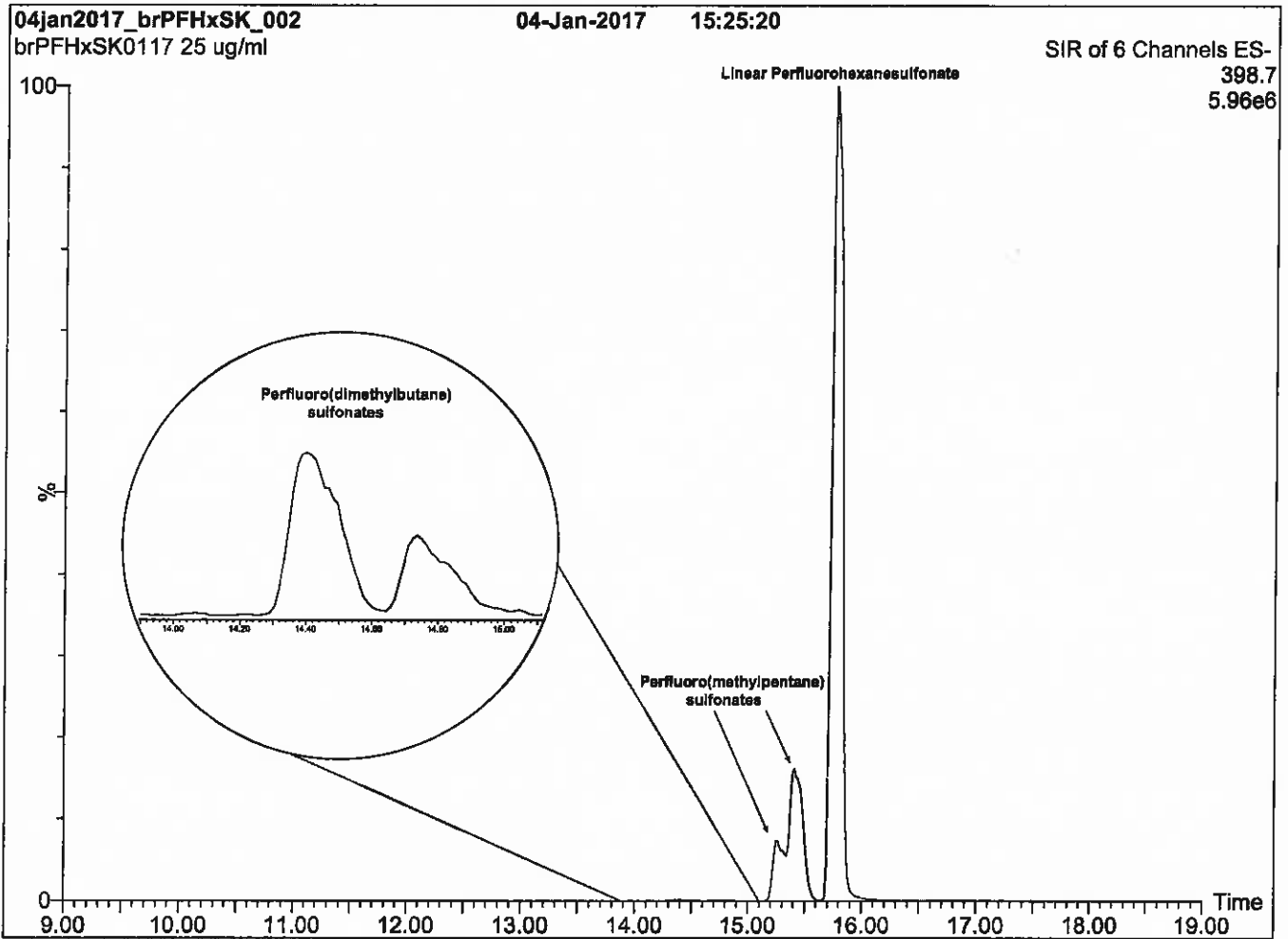
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: br-PFHxSK; LC/MS Data (SIR)



Conditions for Figure 2:

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: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

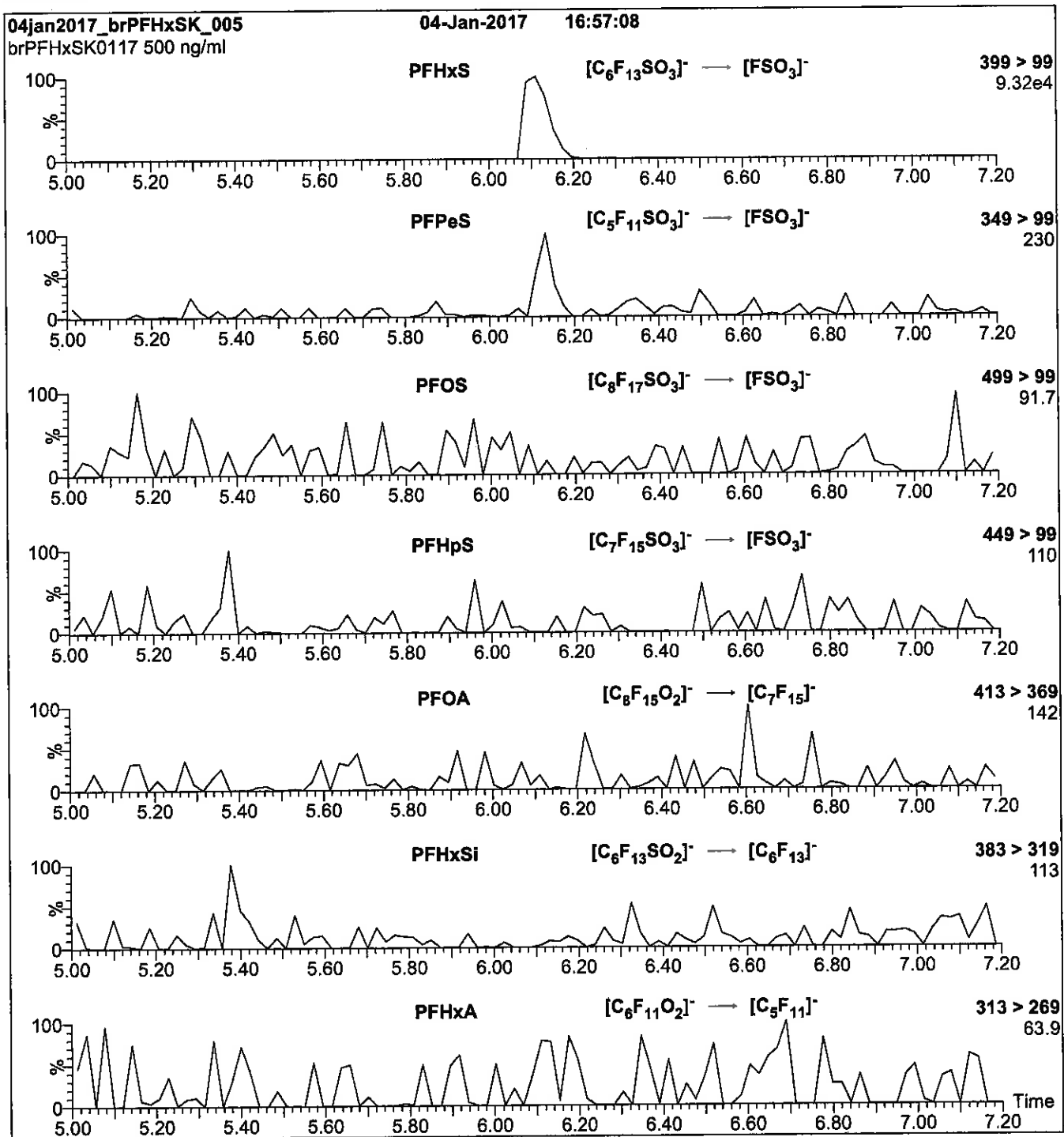
Flow: 300 μ l/min

MS Parameters

Experiment: SIR (6 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = variable (15-62)
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 3: br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 3:

Injection: Direct loop injection
10 μ l (500 ng/ml br-PFHxSK)

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 30

Reagent

LCPFNA_00009

r: 9/2/17 skv



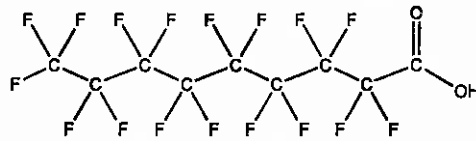
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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFNA
COMPOUND: Perfluoro-n-nonanoic acid

LOT NUMBER: PFNA0717

STRUCTURE: **CAS #:** 375-95-1



MOLECULAR FORMULA: C₉HF₁₇O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 464.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/20/2017
EXPIRY DATE: (mm/dd/yyyy) 07/20/2022
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-octanoic acid (PFOA), < 0.1% of perfluoro-n-heptanoic acid (PFHpA), and < 0.1% of perfluoro-n-undecanoic acid (PFUdA).

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Certified By: 
B.G. Chittim, General Manager

Date: 07/24/2017
(mm/dd/yyyy)

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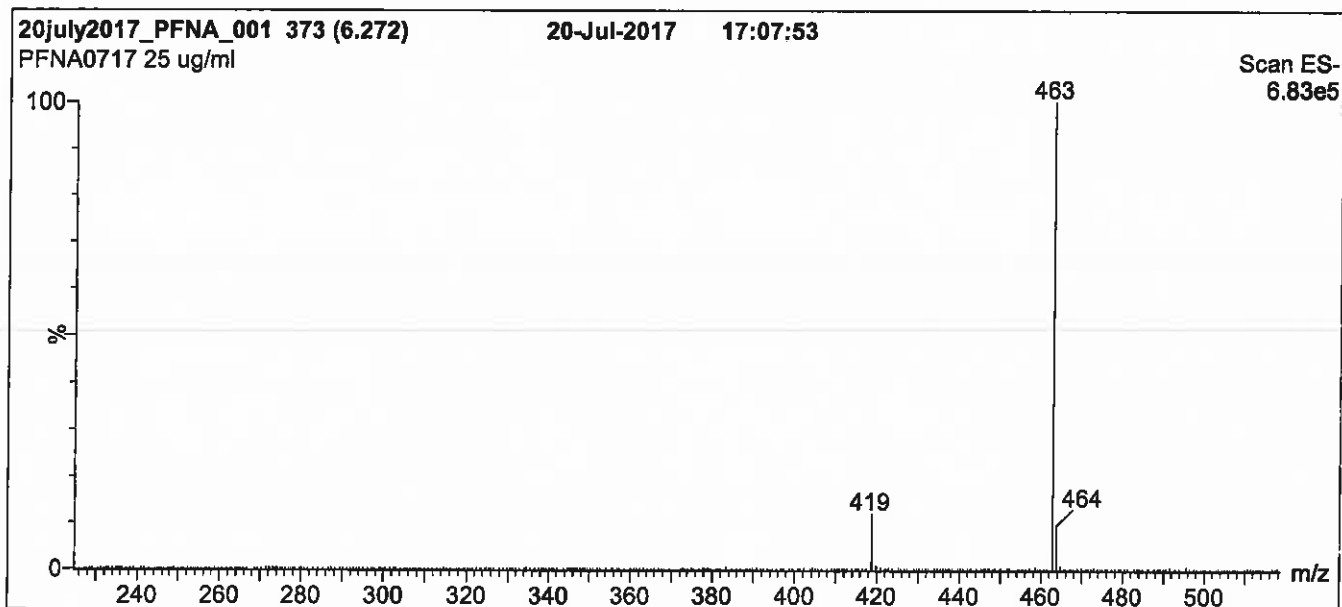
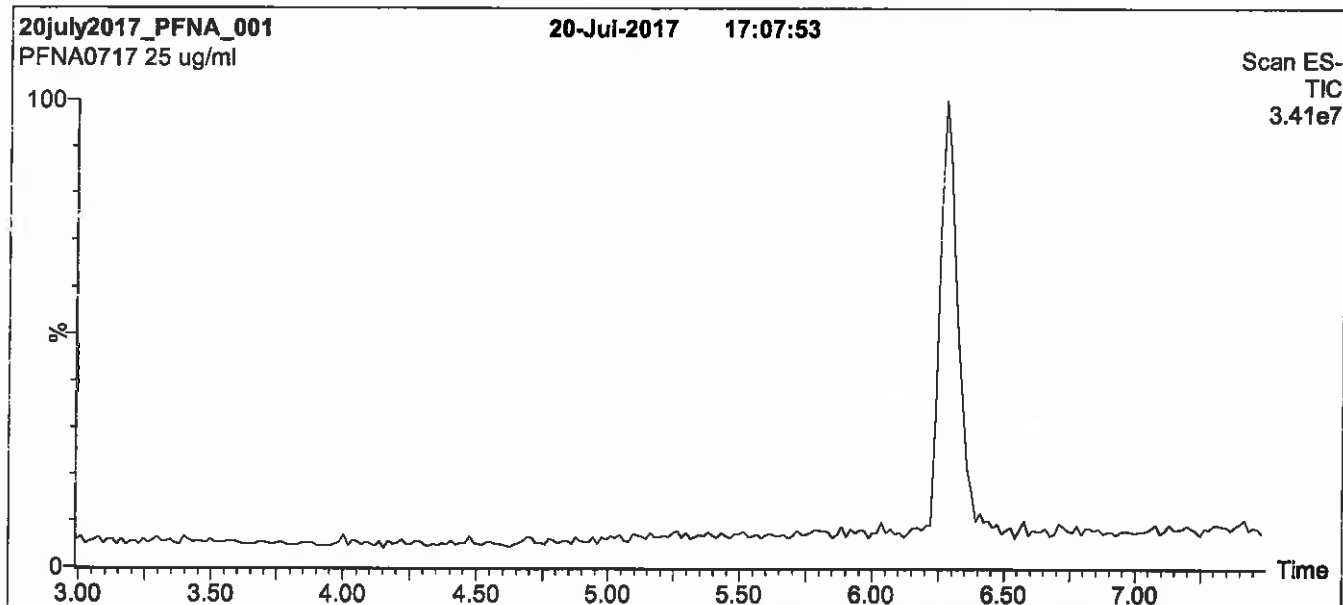
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Figure 1: PFNA; LC/MS Data (TIC and Mass Spectrum)



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)

Hold for 1 min. Ramp to 90% organic over 7 min and hold
for 1 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)

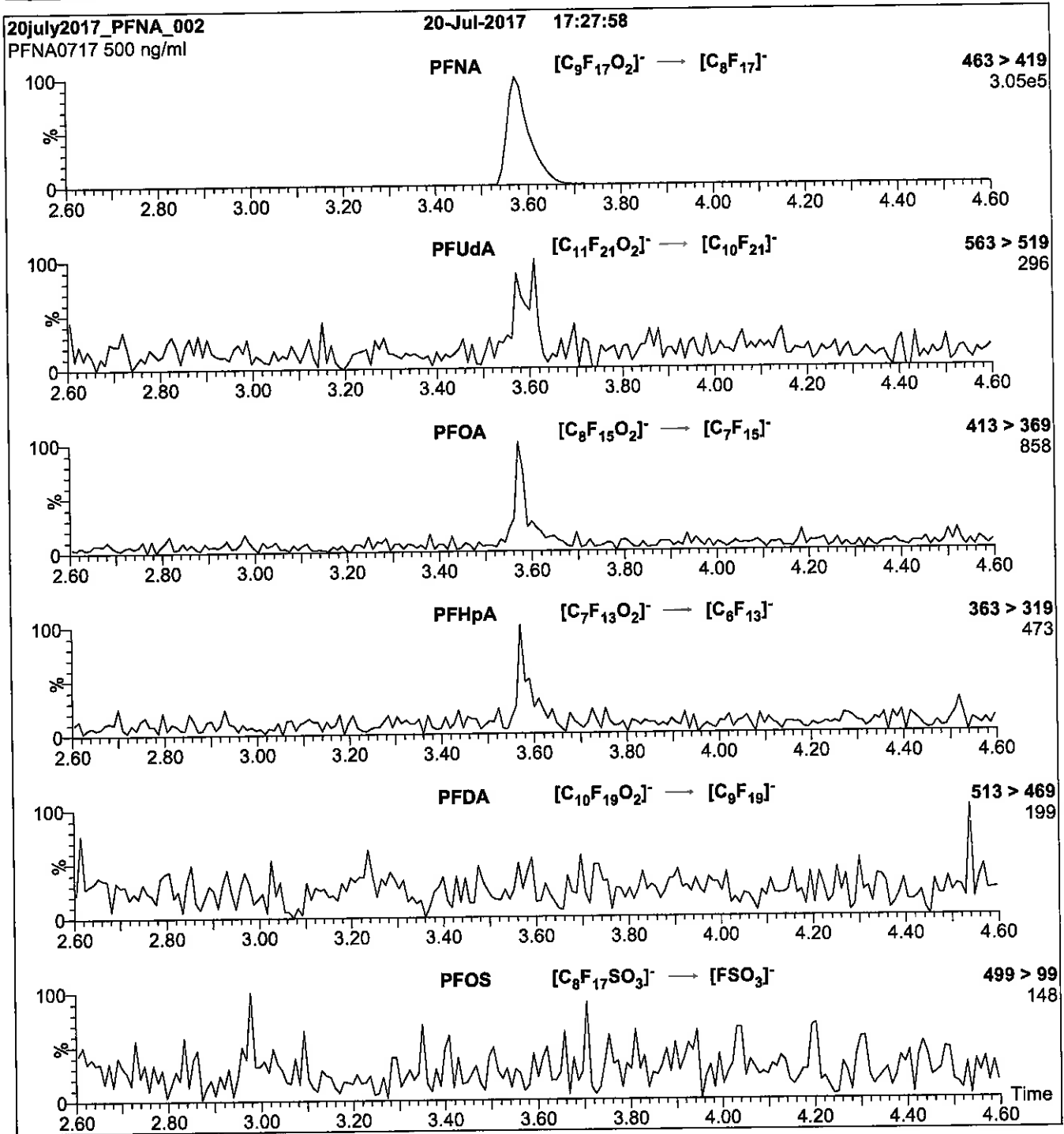
Capillary Voltage (kV) = 2.00

Cone Voltage (V) = 15.00

Cone Gas Flow (l/hr) = 50

Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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) = 3.50e-3
 Collision Energy (eV) = 11

Reagent

LCPFOA_00010

P: 10/2017 SKV



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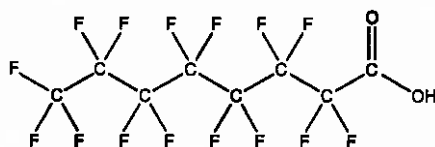
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFOA
COMPOUND: Perfluoro-n-octanoic acid

LOT NUMBER: PFOA0917

STRUCTURE:

CAS #: 335-67-1



MOLECULAR FORMULA: C₈HF₁₅O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 414.07
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/27/2017
EXPIRY DATE: (mm/dd/yyyy) 09/27/2022
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.

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Certified By: 
B.G. Chittim, General Manager

Date: 09/28/2017
(mm/dd/yyyy)

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

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

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

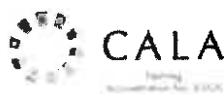
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

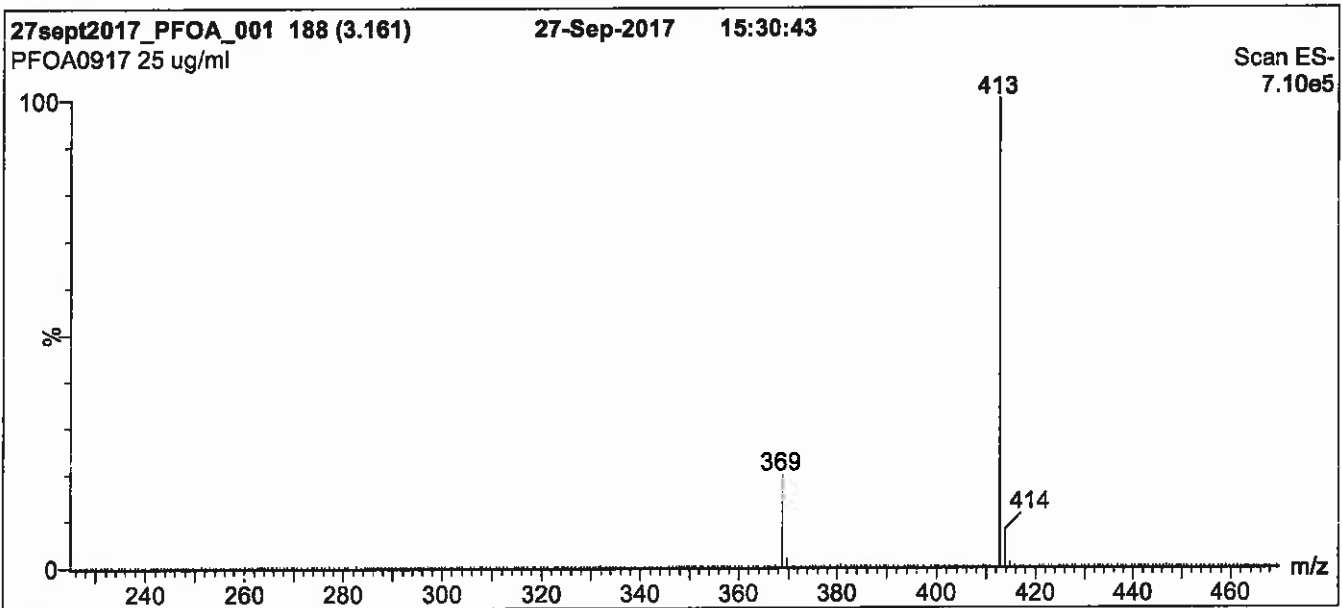
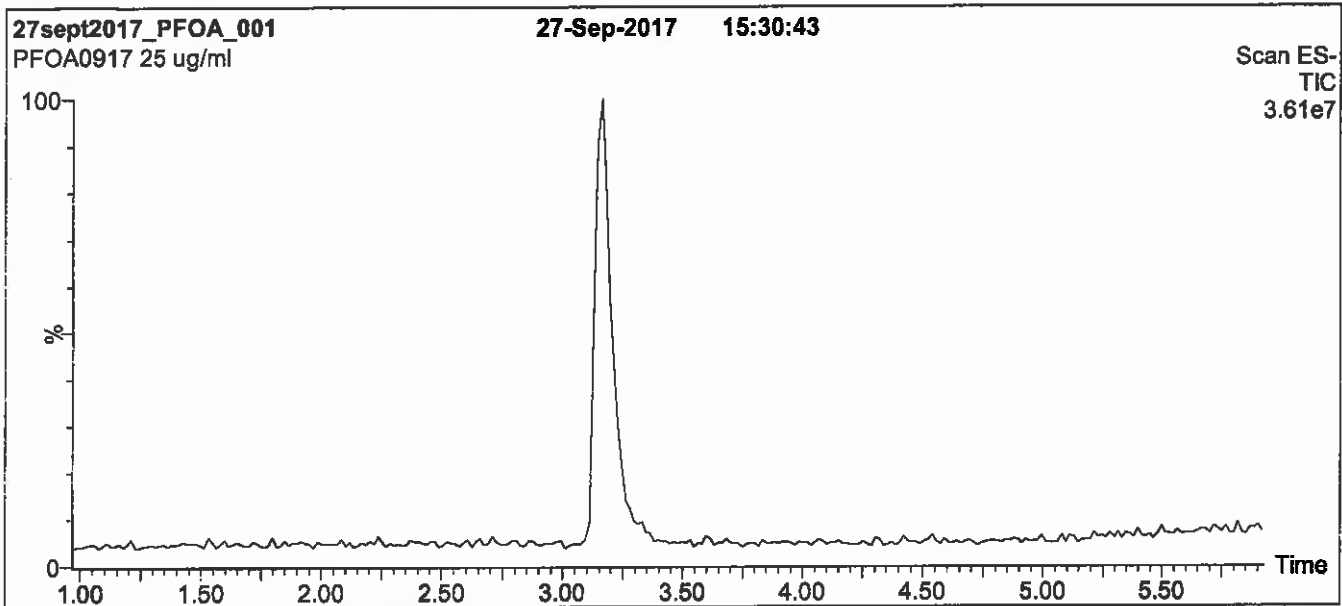
QUALITY MANAGEMENT:

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: PFOA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

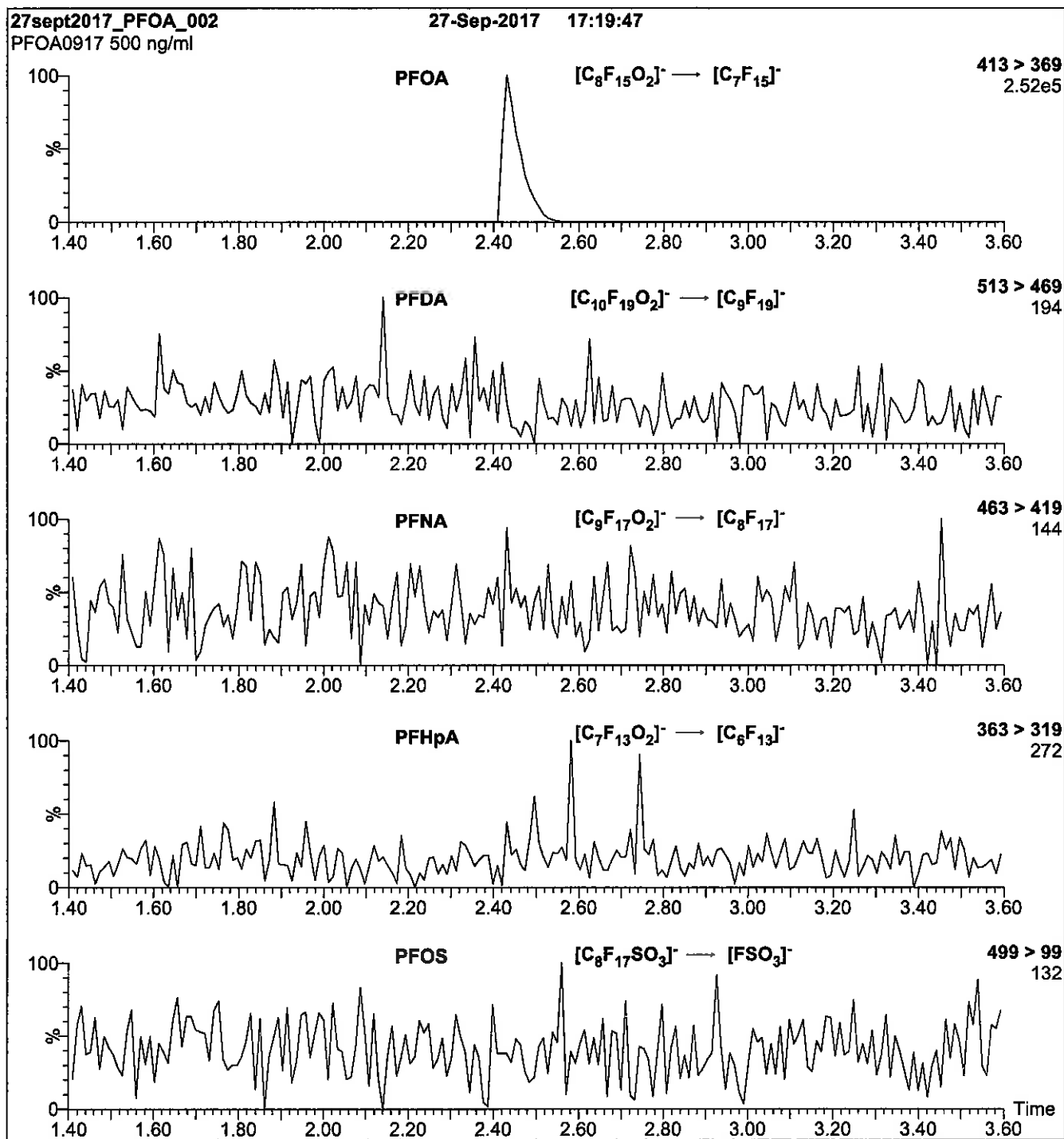
Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 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: PFOA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

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

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) = 11

Reagent

LCPFOS-br_00005

P: 10/2017 SKV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

<u>PRODUCT CODE:</u>	br-PFOSK
<u>LOT NUMBER:</u>	brPFOSK0117
<u>CONCENTRATION:</u>	50 ± 2.5 µg/ml (total potassium salt) 46.4 ± 2.3 µg/ml (total PFOS anion)
<u>SOLVENT(S):</u>	Methanol
<u>DATE PREPARED:</u> (mm/dd/yyyy)	01/09/2017
<u>LAST TESTED:</u> (mm/dd/yyyy)	01/12/2017
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	01/12/2022
<u>RECOMMENDED STORAGE:</u>	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ¹⁹F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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 compounds 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:

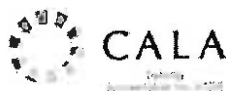
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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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

Table A: br-PFOSK; Isomeric Components and Percent Composition (by ¹⁹F-NMR)*

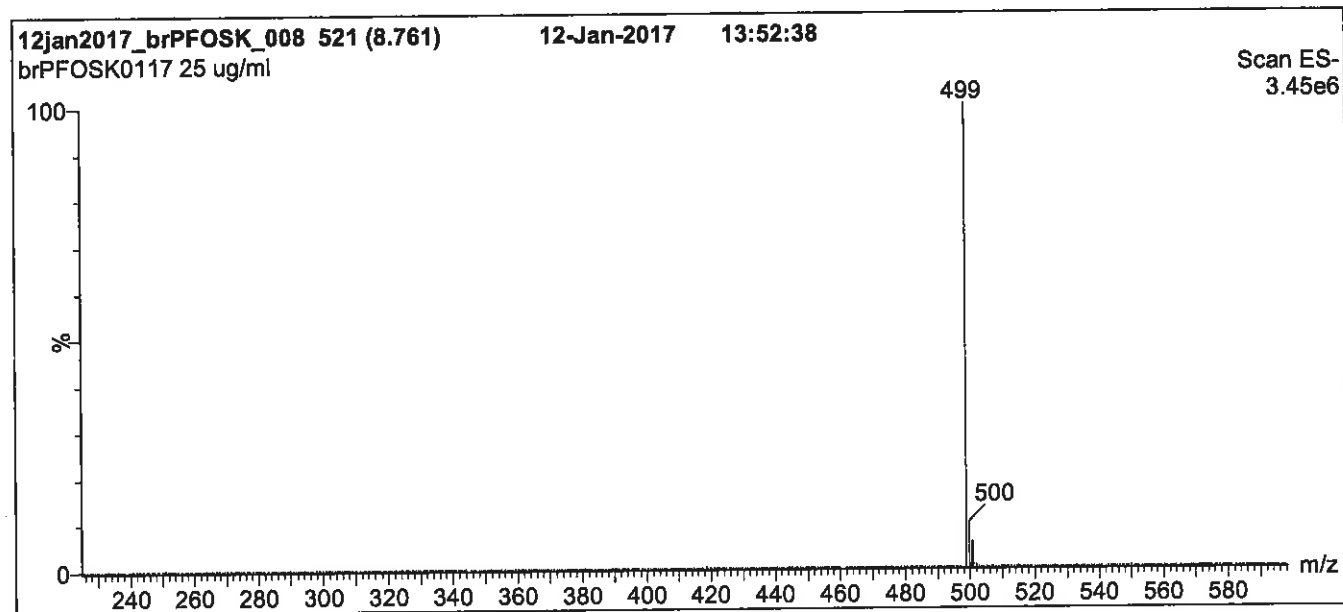
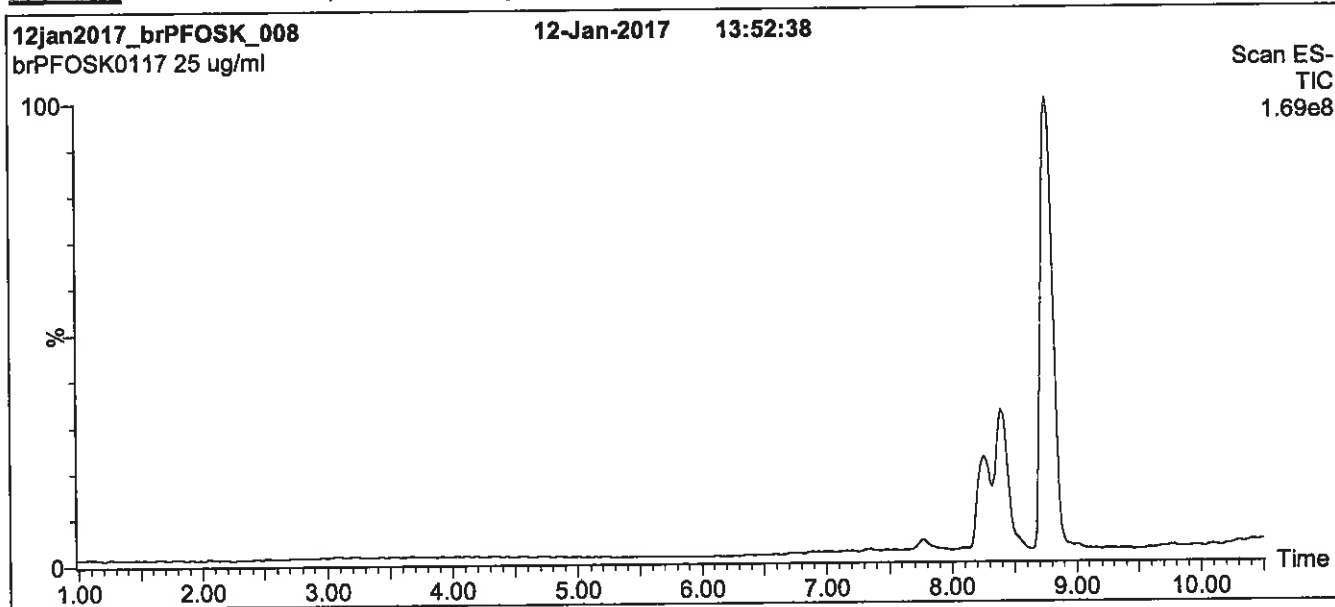
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-octanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃ CF ₃	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃ CF ₃	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃ CF ₃	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃ CF ₃	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labeled in Figure 2.
 ** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: 
 B.G. Chittim

Date: 01/20/2017
 (mm/dd/yyyy)

Figure 1: br-PFOSK; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

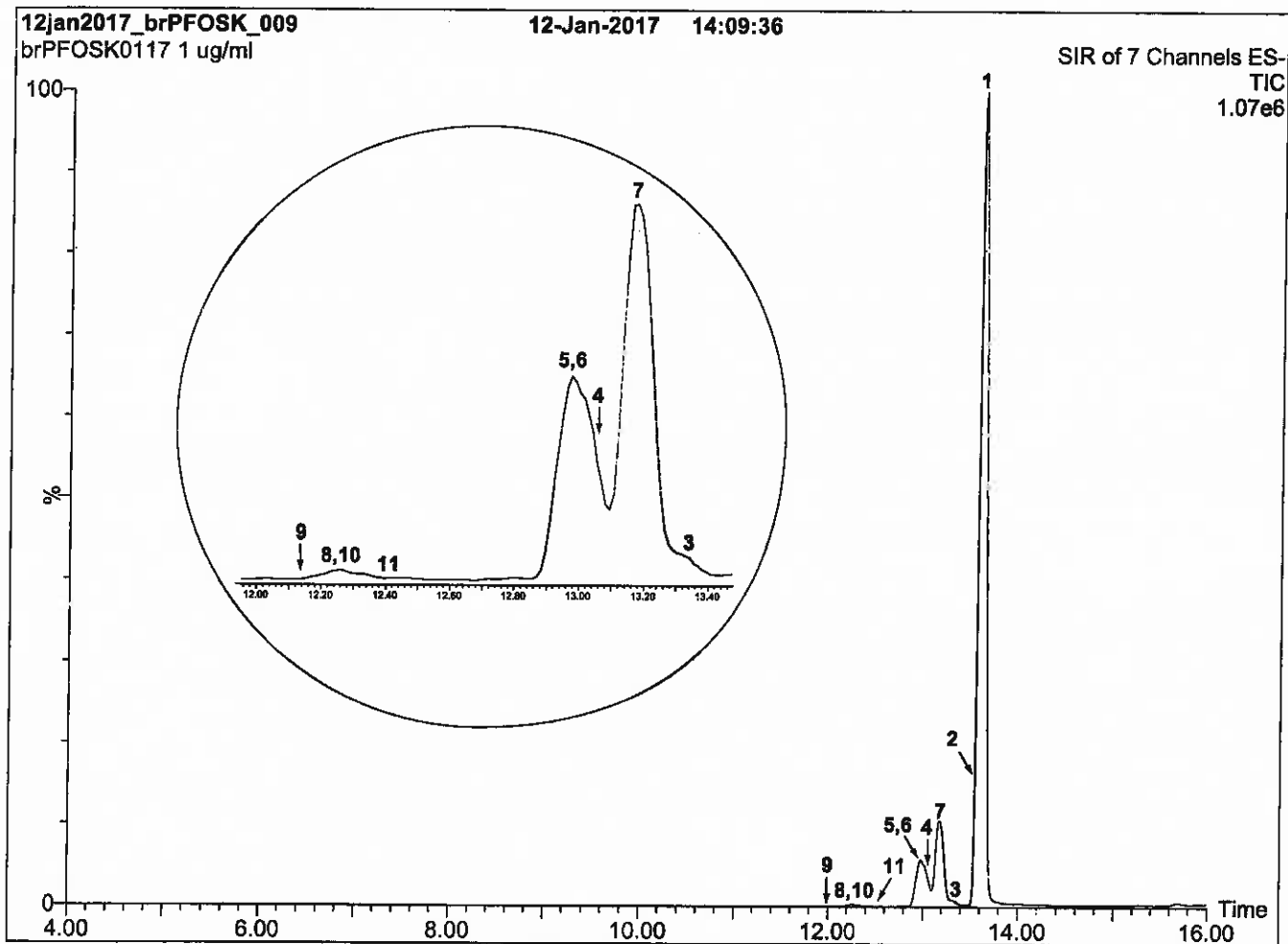
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: br-PFOSK; LC/MS Data (SIR)



Conditions for Figure 2:

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

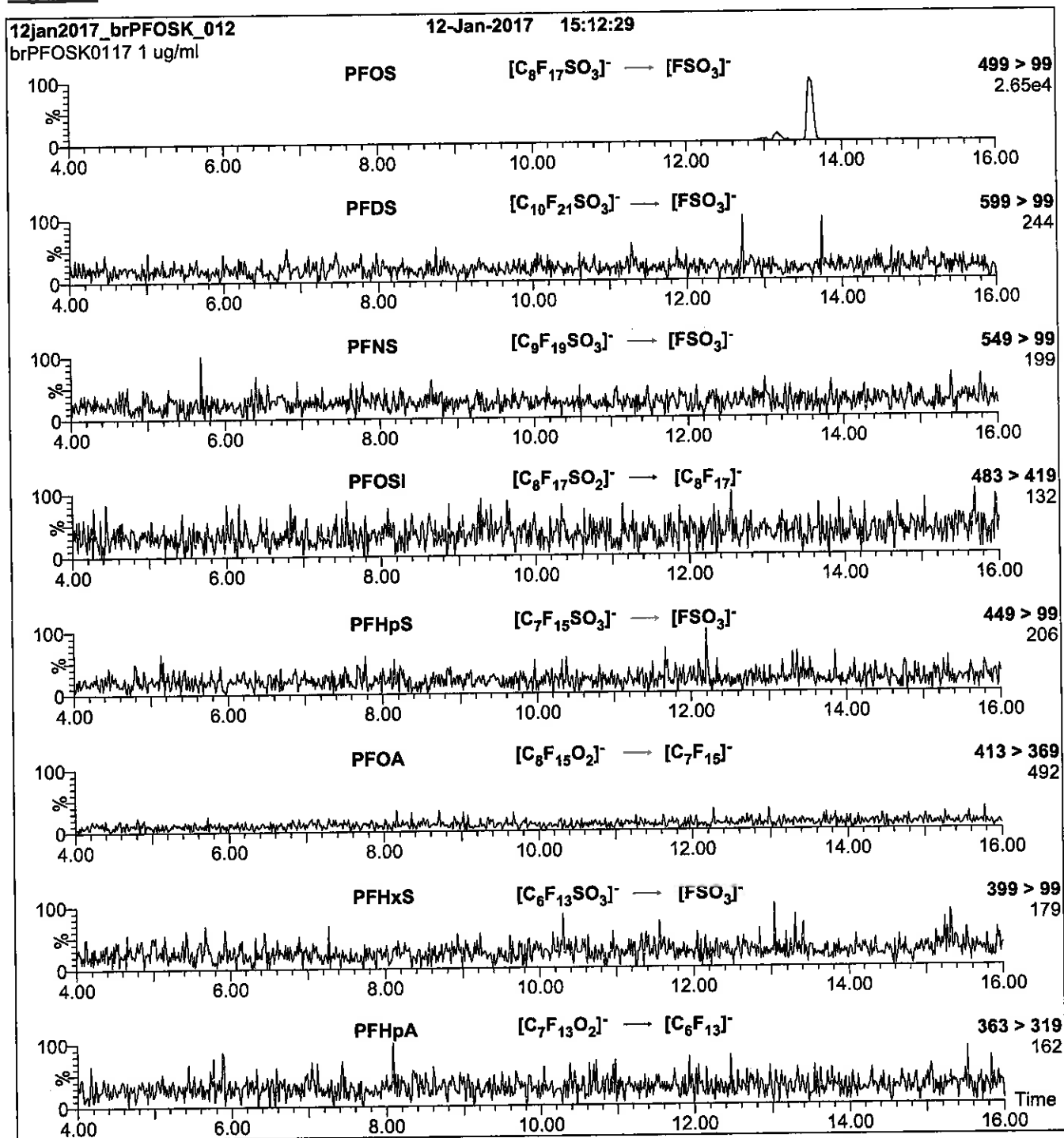
Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈ (1.7 μ m, 2.1 x 100 mm)
Injection: 1.0 μ g/ml of br-PFOSK
Mobile Phase: Gradient
 45% (80:20 MeOH:ACN) / 55% H₂O (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 15 min and hold for 3 min.
 Return to initial conditions over 1 min.
 Time: 20 min
Flow: 300 μ l/min

MS Conditions:

SIR (ES)
 Source = 110 °C
 Desolvation = 325 °C
 Cone Voltage = 60V

Figure 3: br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 11-50 (variable)

Method 537 DOD

Perfluorinated Alkyl Acids (LC/MS)
by Method 537 DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-41679-1

SDG No.: _____

Matrix: Water

Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WGNA-073118-RW-378 5	320-41679-1	88	103
WGNA-073118-FRB-37 85	320-41679-2	86	97
NAWC-073118-RW-154	320-41679-3	80	94
NAWC-073118-FRB-15 4	320-41679-4	86	98
NAWC-073118-RW-185	320-41679-5	81	94
NAWC-073118-FRB-18 5	320-41679-6	98	103
NAWC-073118-RW-179	320-41679-7	87	101
NAWC-073118-FRB-17 9	320-41679-8	87	101
NAWC-073118-RW-124	320-41679-9	83	94
NAWC-073118-FRB-12 4	320-41679-10	87	91
WGNA-073118-RW-310 3	320-41679-11	90	99
WGNA-073118-FRB-31 03	320-41679-12	85	92
	MB 320-237969/1-A	90	95
	LCS 320-237969/2-A	88	94
WGNA-073118-RW-378 5 MS	320-41679-1 MS	90	98
WGNA-073118-RW-378 5 MSD	320-41679-1 MSD	86	99

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.: 320-41679-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.08.07_537C_024.d
 Lab ID: LCS 320-237969/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	132	138	104	70-130	
Perfluorooctanoic acid (PFOA)	66.0	68.3	103	70-130	
Perfluorononanoic acid (PFNA)	66.0	64.4	98	70-130	
Perfluorohexanesulfonic acid (PFHxS)	100	107	107	70-130	
Perfluoroheptanoic acid (PFHpA)	32.0	32.1	100	70-130	
Perfluorobutanesulfonic acid (PFBS)	300	321	107	70-130	

Column to be used to flag recovery and RPD values

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.08.07_537C_026.d
 Lab ID: 320-41679-1 MS Client ID: WGNA-073118-RW-3785 MS

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	131	11 J	146	103	70-130	
Perfluorooctanoic acid (PFOA)	65.8	16 J	79.2	97	70-130	
Perfluorononanoic acid (PFNA)	65.8	21 U	64.8	99	70-130	
Perfluorohexanesulfonic acid (PFHxS)	99.8	15 J	118	103	70-130	
Perfluoroheptanoic acid (PFHpA)	31.9	5.9 J	34.3	89	70-130	
Perfluorobutanesulfonic acid (PFBS)	299	37 U	325	109	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.: 320-41679-1

SDG No.: _____

Matrix: Water Level: Low Lab File ID: 2018.08.07_537C_027.d

Lab ID: 320-41679-1 MSD Client ID: WGNA-073118-RW-3785 MSD

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	135	151	104	3	30	70-130	
Perfluorooctanoic acid (PFOA)	67.8	80.0	95	1	30	70-130	
Perfluorononanoic acid (PFNA)	67.8	65.2	96	1	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	103	120	103	2	30	70-130	
Perfluoroheptanoic acid (PFHpA)	32.9	35.1	89	2	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	308	335	109	3	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.: 320-41679-1
 SDG No.: _____
 Lab File ID: 2018.08.07_537C_023.d Lab Sample ID: MB 320-237969/1-A
 Matrix: Water Date Extracted: 08/04/2018 08:24
 Instrument ID: A8_N Date Analyzed: 08/08/2018 04:40
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-237969/2-A	2018.08.07_537C 024.d	08/08/2018 04:45
WGNA-073118-RW-3785	320-41679-1	2018.08.07_537C 025.d	08/08/2018 04:50
WGNA-073118-RW-3785 MS	320-41679-1 MS	2018.08.07_537C 026.d	08/08/2018 04:55
WGNA-073118-RW-3785 MSD	320-41679-1 MSD	2018.08.07_537C 027.d	08/08/2018 04:59
WGNA-073118-FRB-3785	320-41679-2	2018.08.07_537C 028.d	08/08/2018 05:04
NAWC-073118-RW-154	320-41679-3	2018.08.07_537C 029.d	08/08/2018 05:09
NAWC-073118-FRB-154	320-41679-4	2018.08.07_537C 030.d	08/08/2018 05:13
NAWC-073118-RW-185	320-41679-5	2018.08.07_537C 031.d	08/08/2018 05:18
NAWC-073118-FRB-185	320-41679-6	2018.08.07_537C 032.d	08/08/2018 05:23
NAWC-073118-RW-179	320-41679-7	2018.08.07_537C 035.d	08/08/2018 05:37
NAWC-073118-FRB-179	320-41679-8	2018.08.07_537C 036.d	08/08/2018 05:41
NAWC-073118-RW-124	320-41679-9	2018.08.07_537C 037.d	08/08/2018 05:46
NAWC-073118-FRB-124	320-41679-10	2018.08.07_537C 038.d	08/08/2018 05:51
WGNA-073118-RW-3103	320-41679-11	2018.08.07_537C 039.d	08/08/2018 05:55
WGNA-073118-FRB-3103	320-41679-12	2018.08.07_537C 040.d	08/08/2018 06:00

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Instrument ID: A8_N Calibration Start Date: 08/07/2018 12:44
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 08/07/2018 13:07
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	1166146	1.77	2617368	2.02		
UPPER LIMIT	1749219	2.27	3926052	2.52		
LOWER LIMIT	583073	1.27	1308684	1.52		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-238469/9		1156656	1.77	2655389	2.01	
ICV 320-238469/11		1199776	1.78	2744266	2.01	
CCVL 320-238776/1		1231833	1.76	2765004	2.00	
CCV 320-238610/1 CCVIS		1104849	1.76	2591082	1.99	
MB 320-237969/1-A		1310053	1.76	2893199	2.00	
LCS 320-237969/2-A		1249637	1.76	2724470	2.00	
320-41679-1	WGNA-073118-RW-3785	1291243	1.76	2903279	2.00	
320-41679-1 MS	WGNA-073118-RW-3785 MS	1422947	1.76	3131824	2.00	
320-41679-1 MSD	WGNA-073118-RW-3785 MSD	1410294	1.76	3025296	1.99	
320-41679-2	WGNA-073118-FRB-3785	1318818	1.75	2897246	1.99	
320-41679-3	NAWC-073118-RW-154	1216043	1.76	2589046	2.00	
320-41679-4	NAWC-073118-FRB-154	1282240	1.75	2710739	1.99	
320-41679-5	NAWC-073118-RW-185	1395103	1.75	2974332	1.98	
320-41679-6	NAWC-073118-FRB-185	1180694	1.76	2717096	2.00	
CCV 320-238610/13 CCVIS		1097335	1.76	2390195	2.00	
CCV 320-238612/13 CCVIS		1097335	1.76	2390195	2.00	
320-41679-7	NAWC-073118-RW-179	1328558	1.76	2933682	1.99	
320-41679-8	NAWC-073118-FRB-179	1340148	1.76	2940104	1.99	
320-41679-9	NAWC-073118-RW-124	1465526	1.76	3163107	2.00	
320-41679-10	NAWC-073118-FRB-124	1319545	1.76	2963050	1.99	
320-41679-11	WGNA-073118-RW-3103	1125238	1.75	2495650	1.99	
320-41679-12	WGNA-073118-FRB-3103	1179781	1.76	2532682	1.99	
CCV 320-238612/21 CCVIS		1095270	1.75	2475586	1.99	

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Sample No.: CCV 320-238610/1 Date Analyzed: 08/08/2018 04:31
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.07_537C_021 Heated Purge: (Y/N) N
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1104849	1.76	2591082	1.99		
UPPER LIMIT	1546789	2.26	3627515	2.49		
LOWER LIMIT	773394	1.26	1813757	1.49		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-237969/1-A		1310053	1.76	2893199	2.00	
LCS 320-237969/2-A		1249637	1.76	2724470	2.00	
320-41679-1	WGNA-073118-RW-3785	1291243	1.76	2903279	2.00	
320-41679-1 MS	WGNA-073118-RW-3785 MS	1422947	1.76	3131824	2.00	
320-41679-1 MSD	WGNA-073118-RW-3785 MSD	1410294	1.76	3025296	1.99	
320-41679-2	WGNA-073118-FRB-3785	1318818	1.75	2897246	1.99	
320-41679-3	NAWC-073118-RW-154	1216043	1.76	2589046	2.00	
320-41679-4	NAWC-073118-FRB-154	1282240	1.75	2710739	1.99	
320-41679-5	NAWC-073118-RW-185	1395103	1.75	2974332	1.98	
320-41679-6	NAWC-073118-FRB-185	1180694	1.76	2717096	2.00	

13PFOA = 13C2-PFOA
 13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS
 PFOS = 13C4 PFOS
 Area Limit = 70%-140% of internal standard area
 RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Sample No.: CCV 320-238610/13 Date Analyzed: 08/08/2018 05:27
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.07_537C_033 Heated Purge: (Y/N) N
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1097335	1.76	2390195	2.00		
UPPER LIMIT	1536269	2.26	3346273	2.50		
LOWER LIMIT	768135	1.26	1673137	1.50		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-237969/1-A		1310053	1.76	2893199	2.00	
LCS 320-237969/2-A		1249637	1.76	2724470	2.00	
320-41679-1	WGNA-073118-RW-3785	1291243	1.76	2903279	2.00	
320-41679-1 MS	WGNA-073118-RW-3785 MS	1422947	1.76	3131824	2.00	
320-41679-1 MSD	WGNA-073118-RW-3785 MSD	1410294	1.76	3025296	1.99	
320-41679-2	WGNA-073118-FRB-3785	1318818	1.75	2897246	1.99	
320-41679-3	NAWC-073118-RW-154	1216043	1.76	2589046	2.00	
320-41679-4	NAWC-073118-FRB-154	1282240	1.75	2710739	1.99	
320-41679-5	NAWC-073118-RW-185	1395103	1.75	2974332	1.98	
320-41679-6	NAWC-073118-FRB-185	1180694	1.76	2717096	2.00	

13PFOA = 13C2-PFOA
 13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS
 PFOS = 13C4 PFOS
 Area Limit = 70%-140% of internal standard area
 RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Sample No.: CCV 320-238612/13 Date Analyzed: 08/08/2018 05:27
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.07_537C_033 Heated Purge: (Y/N) N
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1097335	1.76	2390195	2.00		
UPPER LIMIT	1536269	2.26	3346273	2.50		
LOWER LIMIT	768135	1.26	1673137	1.50		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-41679-7	NAWC-073118-RW-179	1328558	1.76	2933682	1.99	
320-41679-8	NAWC-073118-FRB-179	1340148	1.76	2940104	1.99	
320-41679-9	NAWC-073118-RW-124	1465526	1.76	3163107	2.00	
320-41679-10	NAWC-073118-FRB-124	1319545	1.76	2963050	1.99	
320-41679-11	WGNA-073118-RW-3103	1125238	1.75	2495650	1.99	
320-41679-12	WGNA-073118-FRB-3103	1179781	1.76	2532682	1.99	

13PFOA = 13C2-PFOA
 13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS
 PFOS = 13C4 PFOS
 Area Limit = 70%-140% of internal standard area
 RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Sample No.: CCV 320-238612/21 Date Analyzed: 08/08/2018 06:05
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.07_537C_041 Heated Purge: (Y/N) N
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1095270	1.75	2475586	1.99		
UPPER LIMIT	1533378	2.25	3465820	2.49		
LOWER LIMIT	766689	1.25	1732910	1.49		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-41679-7	NAWC-073118-RW-179	1328558	1.76	2933682	1.99	
320-41679-8	NAWC-073118-FRB-179	1340148	1.76	2940104	1.99	
320-41679-9	NAWC-073118-RW-124	1465526	1.76	3163107	2.00	
320-41679-10	NAWC-073118-FRB-124	1319545	1.76	2963050	1.99	
320-41679-11	WGNA-073118-RW-3103	1125238	1.75	2495650	1.99	
320-41679-12	WGNA-073118-FRB-3103	1179781	1.76	2532682	1.99	

13PFOA = 13C2-PFOA
 13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS
 PFOS = 13C4 PFOS
 Area Limit = 70%-140% of internal standard area
 RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: WGNA-073118-RW-3785 Lab Sample ID: 320-41679-1
 Matrix: Water Lab File ID: 2018.08.07_537C_025.d
 Analysis Method: 537 Date Collected: 07/31/2018 08:40
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 240.3(mL) Date Analyzed: 08/08/2018 04:50
 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.: 238610 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	11	J	42	17	7.1
335-67-1	Perfluorooctanoic acid (PFOA)	16	J	21	8.3	2.9
375-95-1	Perfluorononanoic acid (PFNA)	21	U	25	21	8.3
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	15	J	31	12	5.7
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.9	J	10	4.2	2.0
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	94	37	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	88		70-130
STL00996	13C2 PFDA	103		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_025.d
 Lims ID: 320-41679-A-1-A
 Client ID: WGNA-073118-RW-3785
 Sample Type: Client
 Inject. Date: 08-Aug-2018 04:50:20 ALS Bottle#: 14 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-1-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 13:44:21

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	239454	2.00		166	
298.90 > 99.00	1.350	1.350	0.0	1.000	155215		1.54(0.00-0.00)	218	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1250801	8.81		11394	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	633447	3.51		376	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.593	0.0	1.000	195383	1.41		23.7	
* 6 13C2-PFOA									
415.00 > 370.00	1.760	1.760	0.0		1291243	10.0		8852	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.760	1.760	0.0	1.000	531097	3.75		57.8	
413.00 > 169.00	1.760	1.760	0.0	1.000	374075		1.42(0.00-0.00)	527	
* 7 13C4 PFOS									
503.00 > 80.00	1.995	1.988	0.007		2903279	28.7		2514	
9 Perfluorononanoic acid									
463.00 > 419.00	1.927	1.995	-0.068	1.000	144096	1.42		10.9	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	1.995	2.018	-0.023	1.000	290240	2.63		90.9	
499.00 > 99.00	1.995	2.018	-0.023	1.000	52339		5.55(0.00-0.00)	76.8	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.208	2.208	0.0	1.000	1089844	10.3		9993	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_025.d

Injection Date: 08-Aug-2018 04:50:20

Instrument ID: A8_N

Lims ID: 320-41679-A-1-A

Lab Sample ID: 320-41679-1

Client ID: WGNA-073118-RW-3785

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 14

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

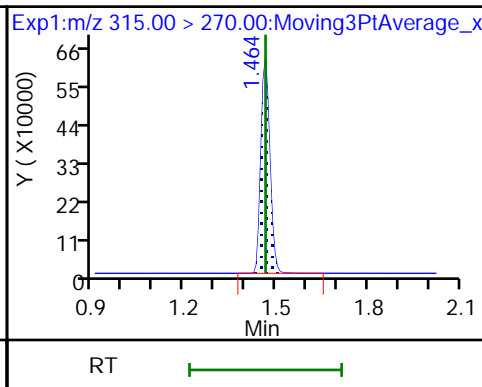
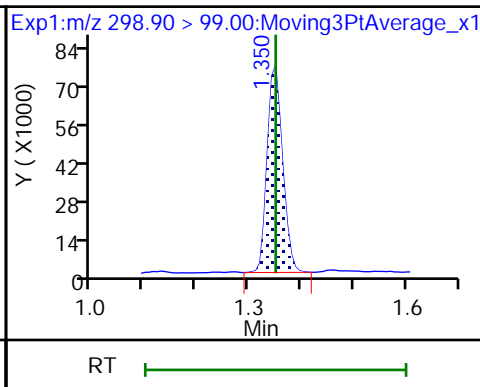
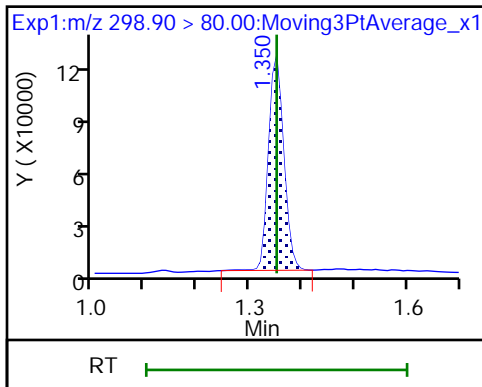
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

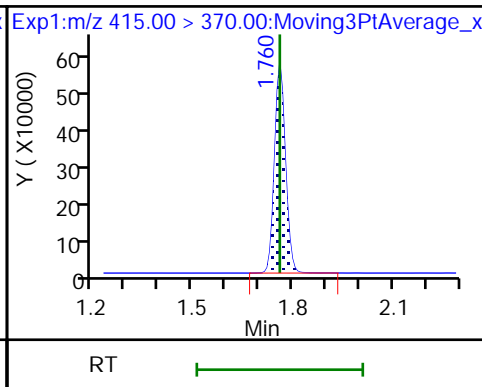
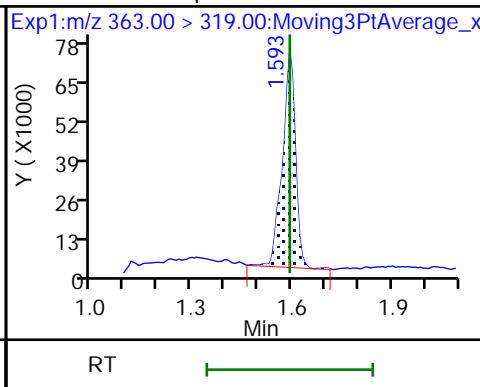
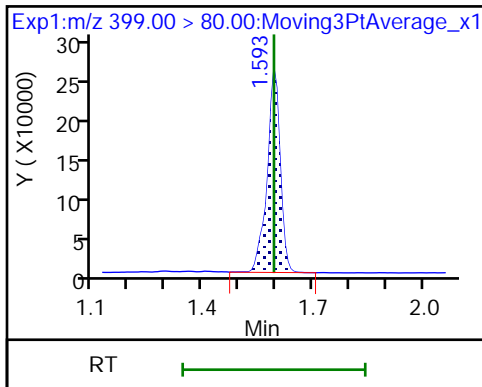
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

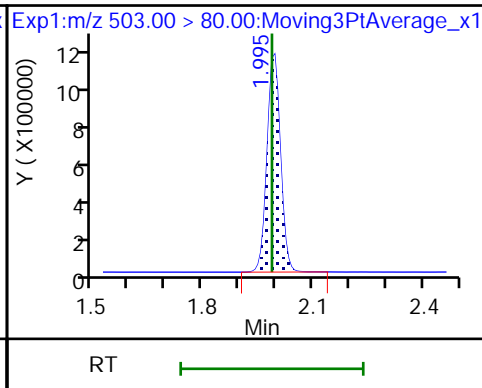
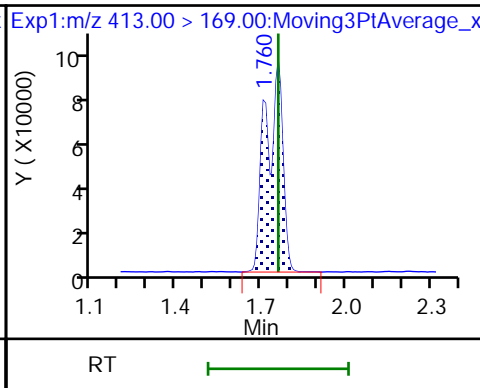
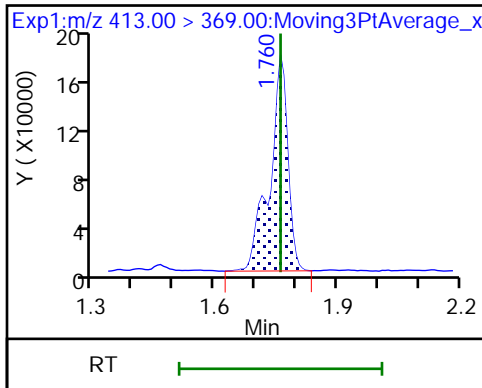
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

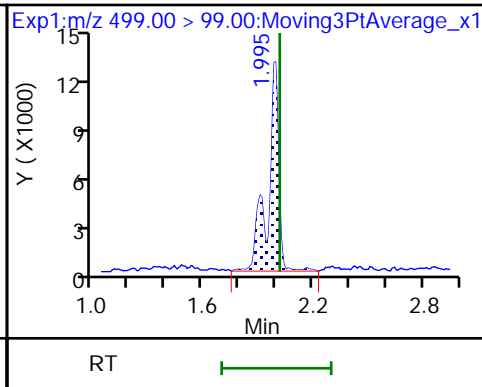
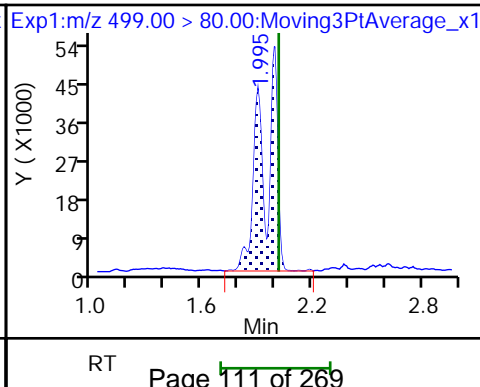
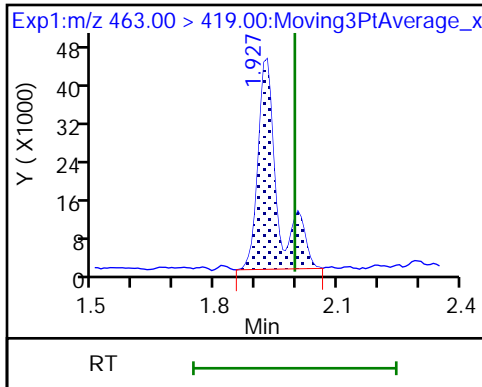
* 7 13C4 PFOS



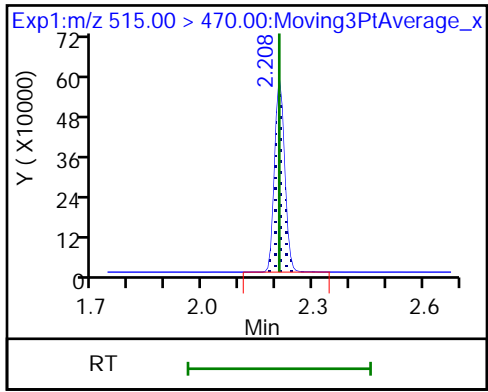
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_025.d
 Lims ID: 320-41679-A-1-A
 Client ID: WGNA-073118-RW-3785
 Sample Type: Client
 Inject. Date: 08-Aug-2018 04:50:20 ALS Bottle#: 14 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-1-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 13:44:21

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.81	88.09
\$ 10 13C2 PFDA	10.0	10.3	103.07

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: WGNA-073118-FRB-3785 Lab Sample ID: 320-41679-2
 Matrix: Water Lab File ID: 2018.08.07_537C_028.d
 Analysis Method: 537 Date Collected: 07/31/2018 08:35
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 261.7(mL) Date Analyzed: 08/08/2018 05:04
 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.: 238610 Units: ng/L

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)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
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	86		70-130
STL00996	13C2 PFDA	97		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_028.d
 Lims ID: 320-41679-A-2-A
 Client ID: WGNA-073118-FRB-3785
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:04:22 ALS Bottle#: 17 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-2-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.457	1.464	-0.007	1.000	1252161	8.63	10586	
* 6 13C2-PFOA	415.00 > 370.00	1.753	1.760	-0.007		1318818	10.0	7558	
* 7 13C4 PFOS	503.00 > 80.00	1.988	1.988	0.0		2897246	28.7	3716	
\$ 10 13C2 PFDA	515.00 > 470.00	2.200	2.208	-0.008	1.000	1045967	9.69	7885	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_028.d

Injection Date: 08-Aug-2018 05:04:22

Instrument ID: A8_N

Lims ID: 320-41679-A-2-A

Lab Sample ID: 320-41679-2

Client ID: WGNA-073118-FRB-3785

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 17

Worklist Smp#: 8

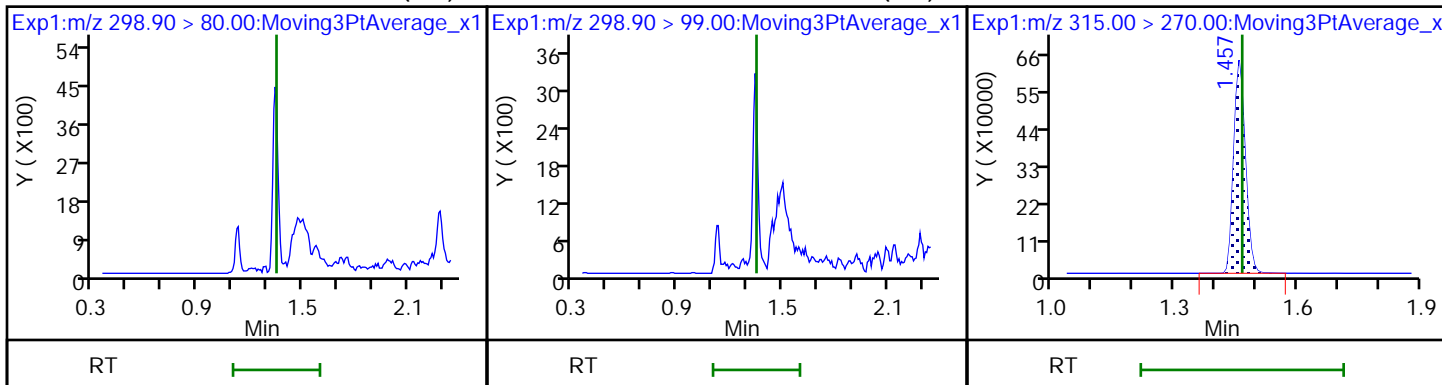
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

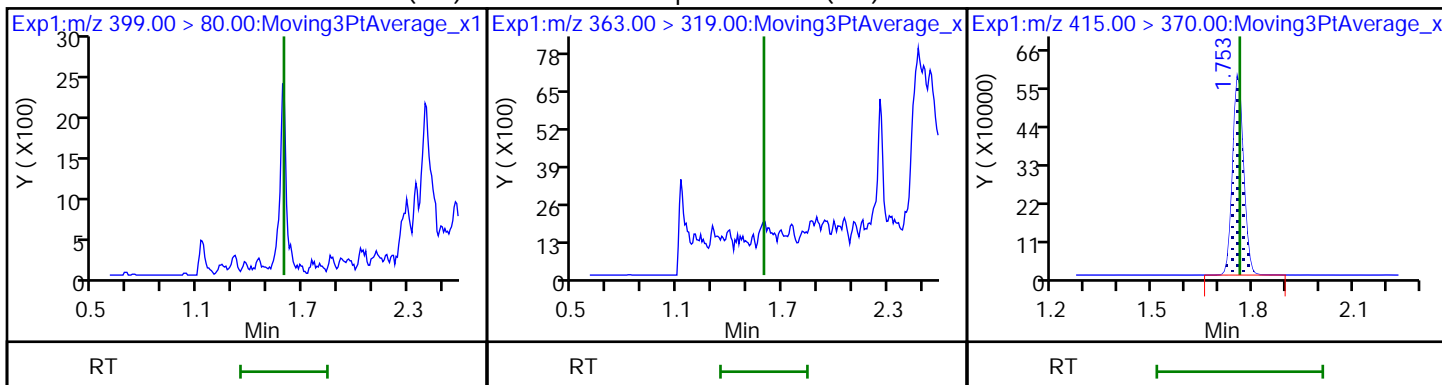
Method: 537_A8_N

Limit Group: LC 537 ICAL

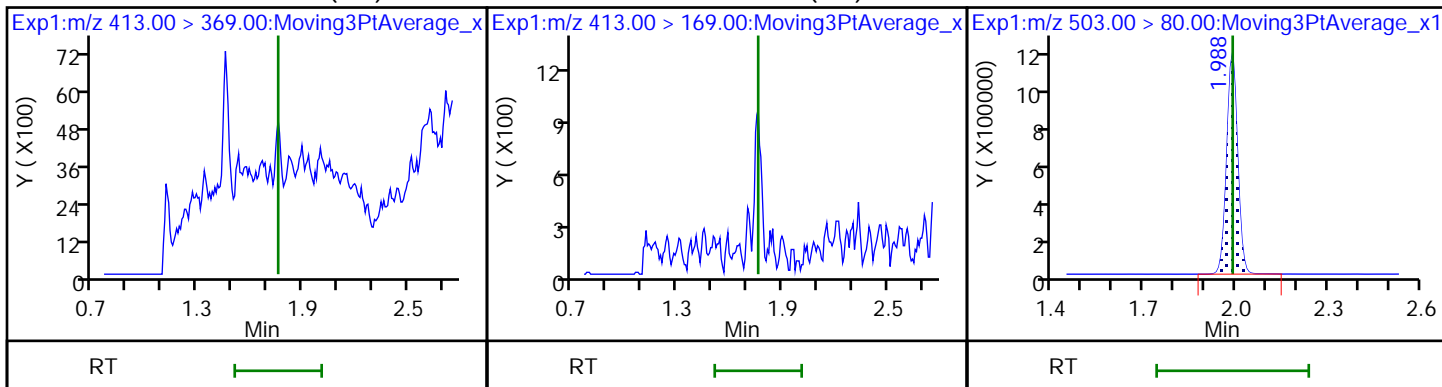
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



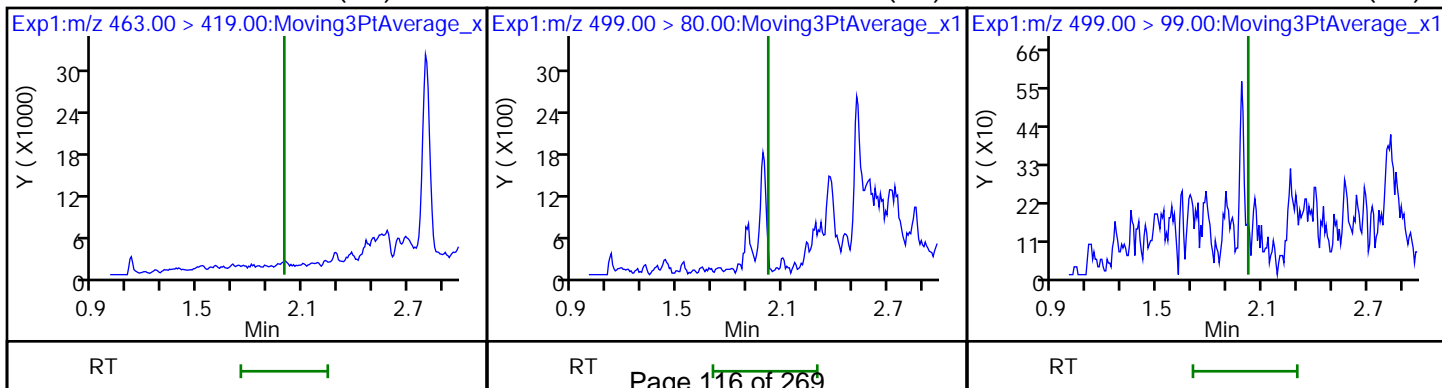
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



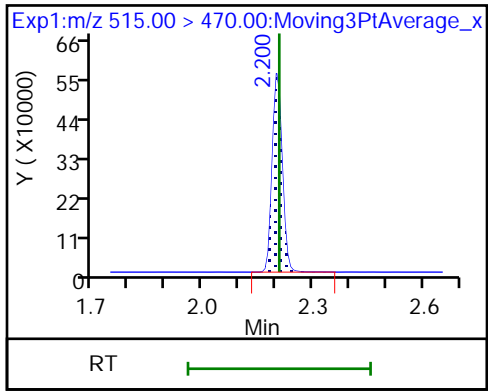
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) * 7 13C4 PFOS



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



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_028.d
 Lims ID: 320-41679-A-2-A
 Client ID: WGNA-073118-FRB-3785
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:04:22 ALS Bottle#: 17 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-2-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.63	86.34
\$ 10 13C2 PFDA	10.0	9.69	96.86

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-RW-154 Lab Sample ID: 320-41679-3
 Matrix: Water Lab File ID: 2018.08.07_537C_029.d
 Analysis Method: 537 Date Collected: 07/31/2018 10:10
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 254.3(mL) Date Analyzed: 08/08/2018 05:09
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238610 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	17	J	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	24		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	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.9	J	9.8	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	80		70-130
STL00996	13C2 PFDA	94		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_029.d
 Lims ID: 320-41679-A-3-A
 Client ID: NAWC-073118-RW-154
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:09:01 ALS Bottle#: 18 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-3-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 13:45:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	226817	2.12		172	
298.90 > 99.00	1.350	1.350	0.0	1.000	156047		1.45(0.00-0.00)	213	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1074437	8.04		9253	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	180903	1.12		110	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.593	0.0	1.000	296033	2.26		50.4	
* 6 13C2-PFOA									
415.00 > 370.00	1.760	1.760	0.0		1216043	10.0		8174	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.760	1.760	0.0	1.000	824506	6.19		108	
413.00 > 169.00	1.760	1.760	0.0	1.000	462284		1.78(0.00-0.00)	929	
* 7 13C4 PFOS									
503.00 > 80.00	1.995	1.988	0.007		2589046	28.7		2472	
9 Perfluorononanoic acid									
463.00 > 419.00	2.003	1.995	0.008	1.000	49986	0.5215		5.0	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	1.995	2.018	-0.023	1.000	429708	4.36		150	
499.00 > 99.00	1.995	2.018	-0.023	1.000	72179		5.95(0.00-0.00)	111	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.208	2.208	0.0	1.000	933023	9.37		8079	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_029.d

Injection Date: 08-Aug-2018 05:09:01

Instrument ID: A8_N

Lims ID: 320-41679-A-3-A

Lab Sample ID: 320-41679-3

Client ID: NAWC-073118-RW-154

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 18

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

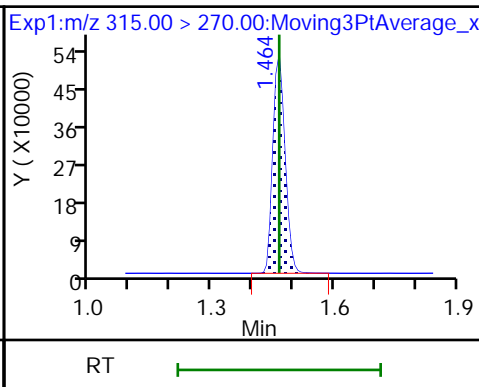
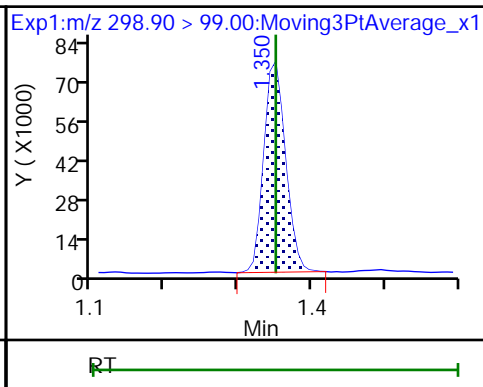
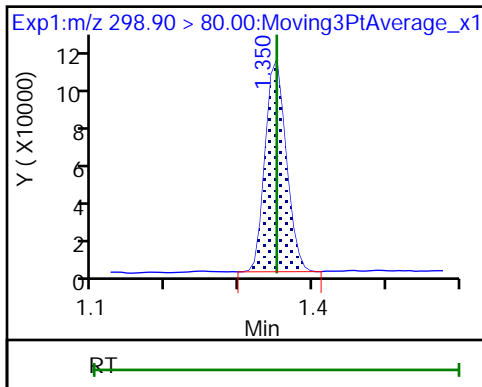
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

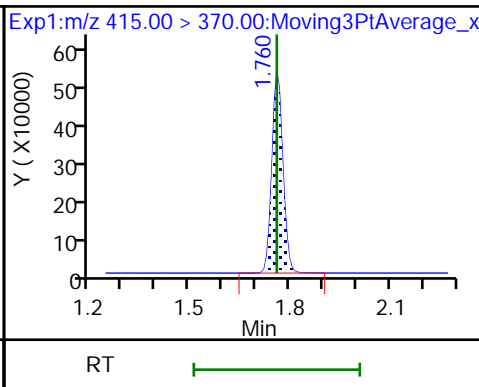
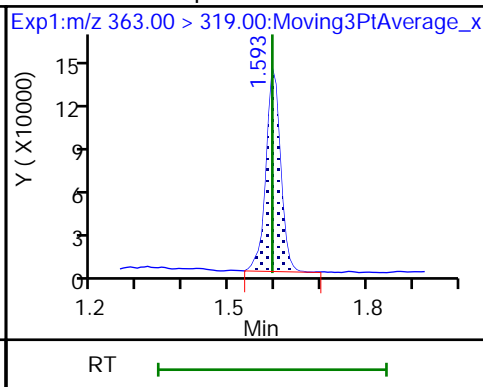
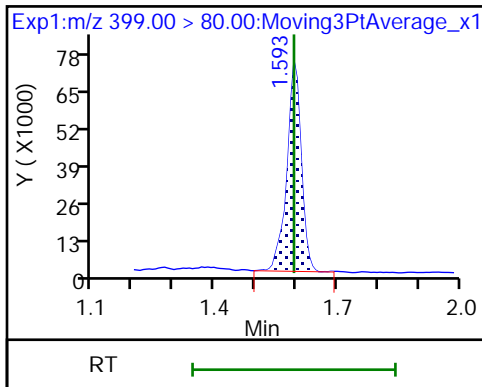
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

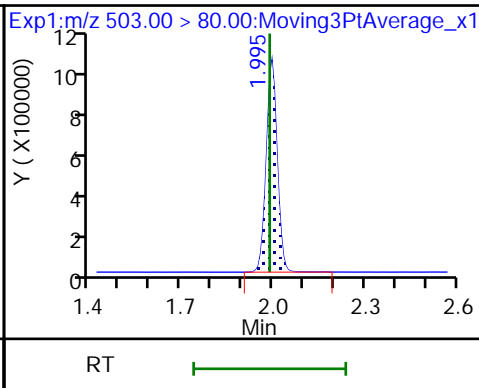
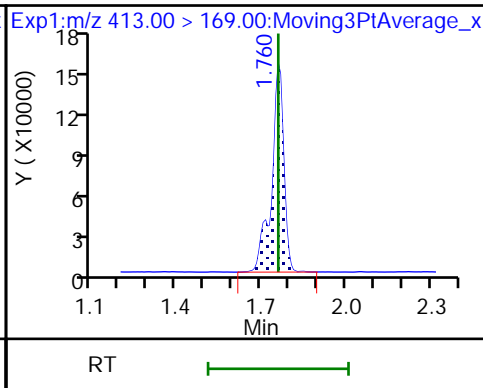
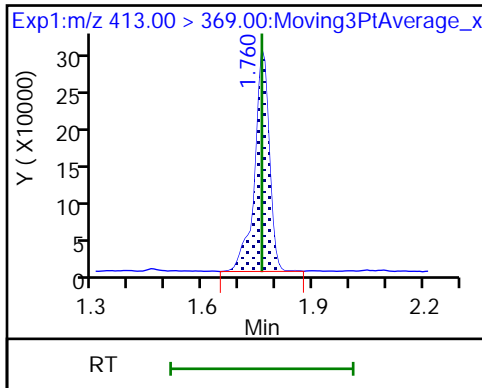
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

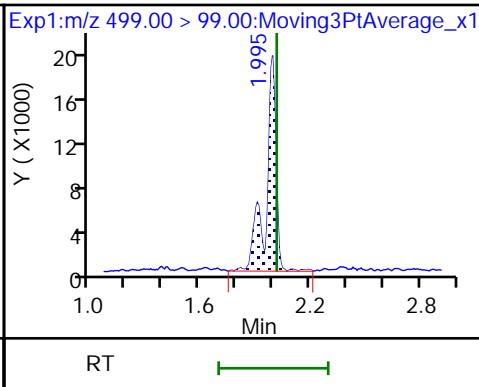
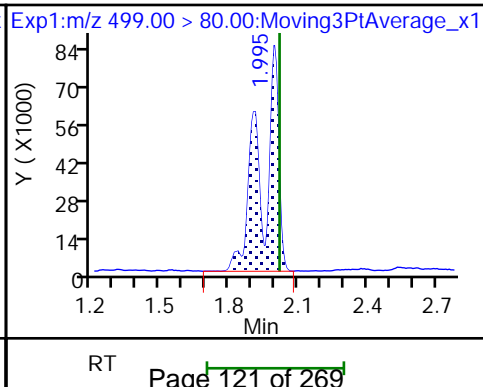
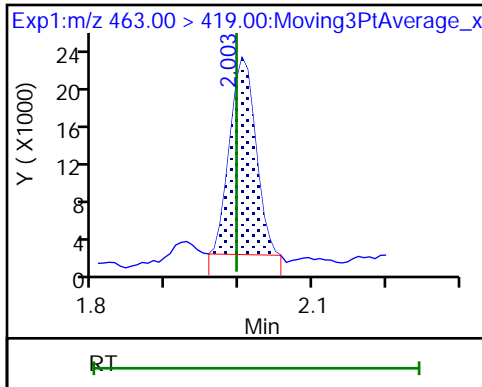
* 7 13C4 PFOS



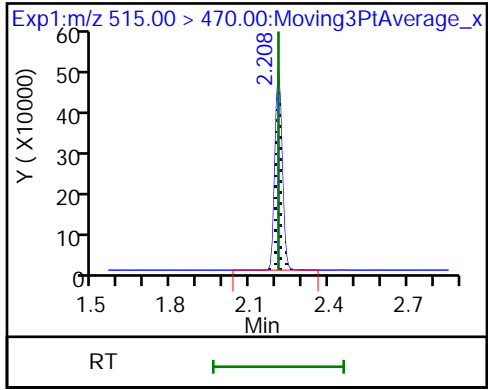
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_029.d
 Lims ID: 320-41679-A-3-A
 Client ID: NAWC-073118-RW-154
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:09:01 ALS Bottle#: 18 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-3-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 13:45:22

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.04	80.35
\$ 10 13C2 PFDA	10.0	9.37	93.70

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-FRB-154 Lab Sample ID: 320-41679-4
 Matrix: Water Lab File ID: 2018.08.07_537C_030.d
 Analysis Method: 537 Date Collected: 07/31/2018 10:05
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 257.7(mL) Date Analyzed: 08/08/2018 05:13
 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.: 238610 Units: ng/L

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	86		70-130
STL00996	13C2 PFDA	98		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_030.d
 Lims ID: 320-41679-A-4-A
 Client ID: NAWC-073118-FRB-154
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:13:40 ALS Bottle#: 19 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-4-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.457	1.464	-0.007	1.000	1217211	8.63	11452	
* 6 13C2-PFOA	415.00 > 370.00	1.753	1.760	-0.007		1282240	10.0	7924	
* 7 13C4 PFOS	503.00 > 80.00	1.988	1.988	0.0		2710739	28.7	3068	
\$ 10 13C2 PFDA	515.00 > 470.00	2.200	2.208	-0.008	1.000	1023803	9.75	7245	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_030.d

Injection Date: 08-Aug-2018 05:13:40

Instrument ID: A8_N

Lims ID: 320-41679-A-4-A

Lab Sample ID: 320-41679-4

Client ID: NAWC-073118-FRB-154

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 19

Worklist Smp#: 10

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

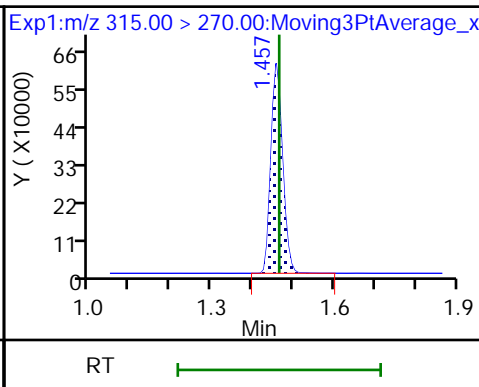
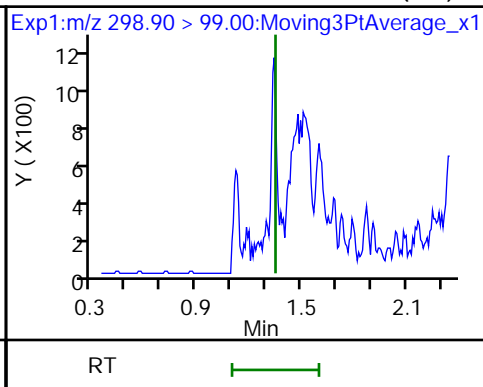
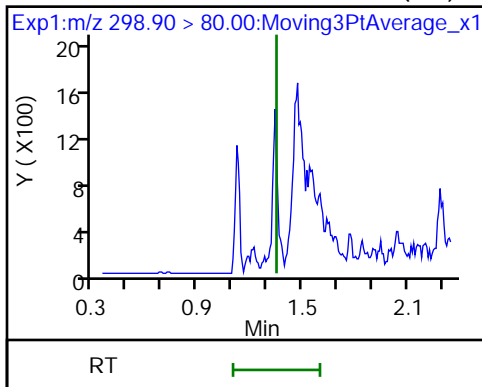
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

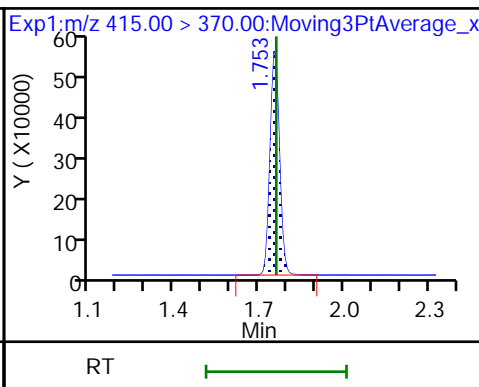
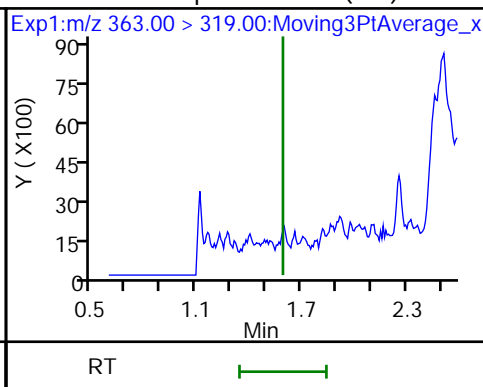
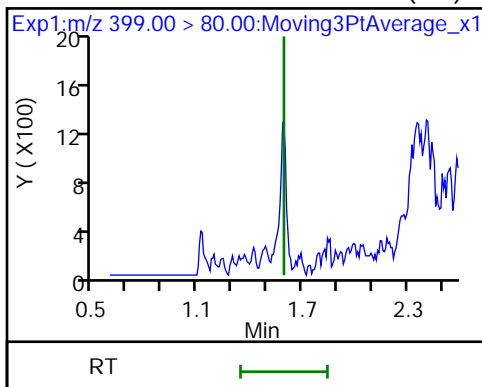
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

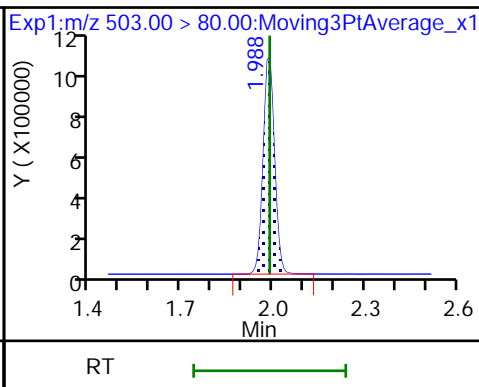
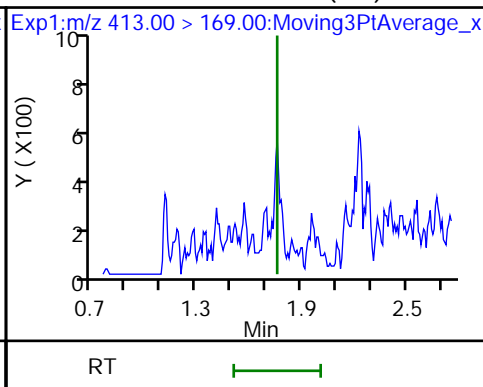
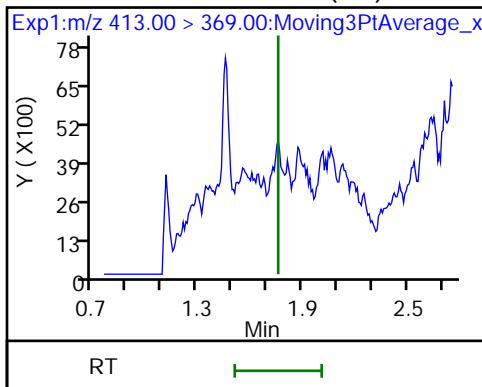
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

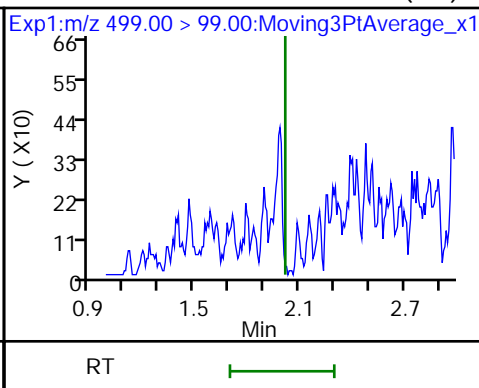
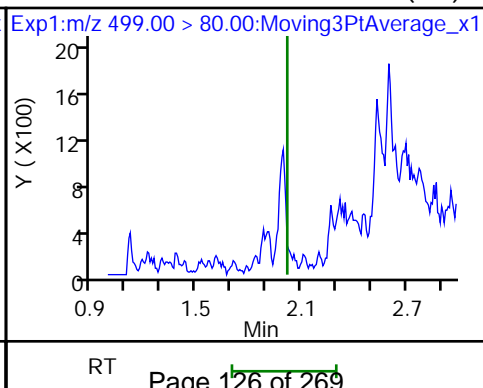
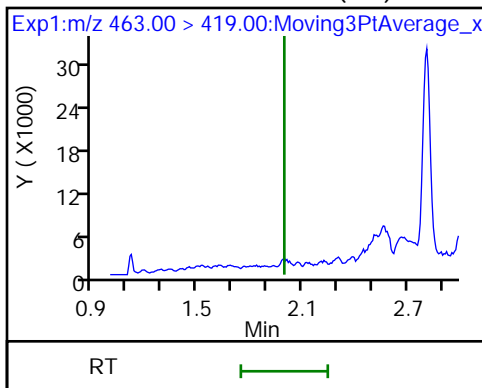
* 7 13C4 PFOS



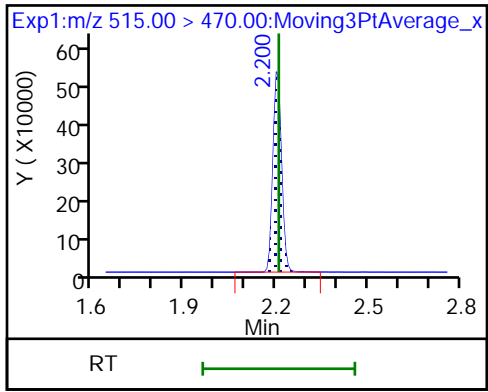
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_030.d
 Lims ID: 320-41679-A-4-A
 Client ID: NAWC-073118-FRB-154
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:13:40 ALS Bottle#: 19 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-4-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.63	86.33
\$ 10 13C2 PFDA	10.0	9.75	97.51

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-RW-185 Lab Sample ID: 320-41679-5
 Matrix: Water Lab File ID: 2018.08.07_537C_031.d
 Analysis Method: 537 Date Collected: 07/31/2018 11:10
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 265.9(mL) Date Analyzed: 08/08/2018 05:18
 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.: 238610 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	J	38	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	12	J	19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.5	J	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.2	J	9.4	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	81		70-130
STL00996	13C2 PFDA	94		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_031.d
 Lims ID: 320-41679-A-5-A
 Client ID: NAWC-073118-RW-185
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:18:21 ALS Bottle#: 20 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-5-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 13:45:48

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.343	1.350	-0.007	1.000	146774	1.20		109	
298.90 > 99.00	1.343	1.350	-0.007	1.000	104118		1.41(0.00-0.00)	155	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.457	1.464	-0.007	1.000	1247114	8.13		11983	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.586	1.593	-0.007	1.000	417701	2.26		221	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.586	1.593	-0.007	1.000	329024	2.19		52.0	
* 6 13C2-PFOA									
415.00 > 370.00	1.753	1.760	-0.007		1395103	10.0		9004	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.753	1.760	-0.007	1.000	485892	3.18		63.7	
413.00 > 169.00	1.753	1.760	-0.007	1.000	273122		1.78(0.00-0.00)	578	
* 7 13C4 PFOS									
503.00 > 80.00	1.980	1.988	-0.008		2974332	28.7		2460	
9 Perfluorononanoic acid									
463.00 > 419.00	1.995	1.995	0.0	1.000	62830	0.5714		6.0	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	1.980	2.018	-0.038	1.000	452721	4.00		154	
499.00 > 99.00	1.980	2.018	-0.038	1.000	89543		5.06(0.00-0.00)	140	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.200	2.208	-0.008	1.000	1073651	9.40		8434	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_031.d

Injection Date: 08-Aug-2018 05:18:21

Instrument ID: A8_N

Lims ID: 320-41679-A-5-A

Lab Sample ID: 320-41679-5

Client ID: NAWC-073118-RW-185

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 20

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

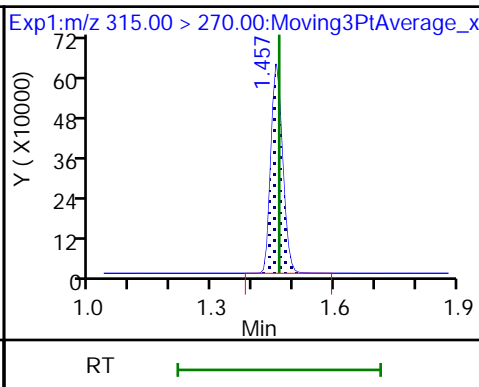
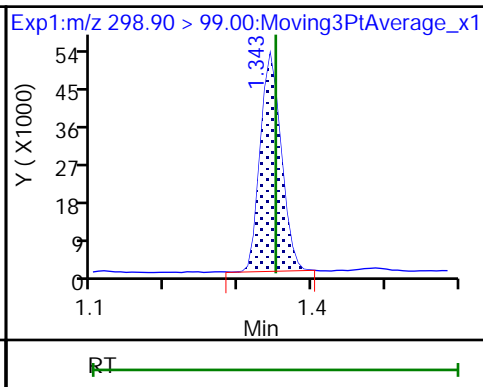
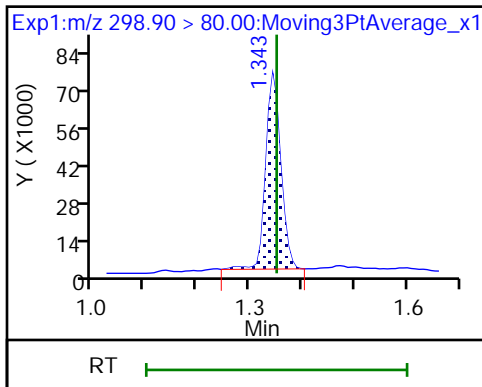
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

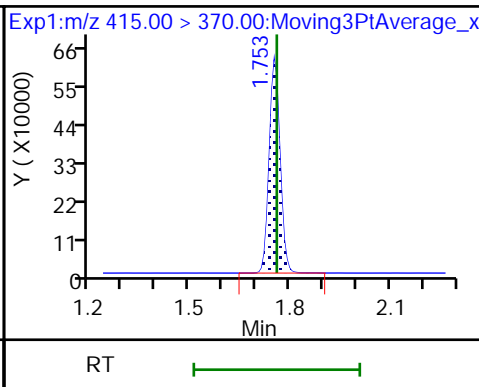
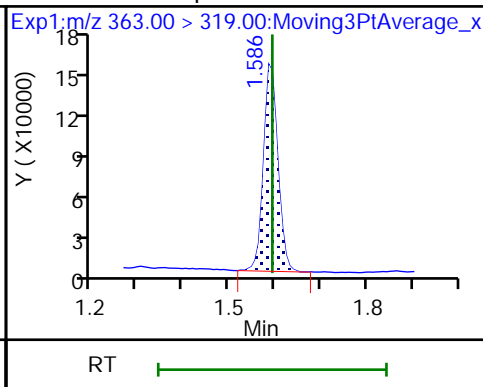
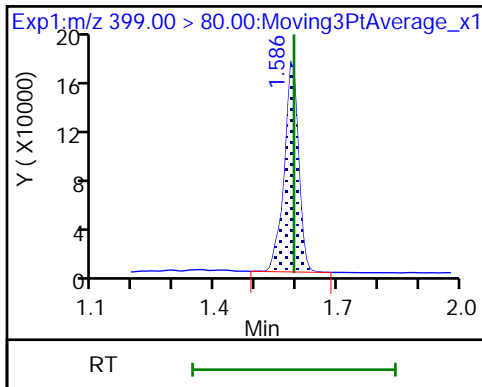
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

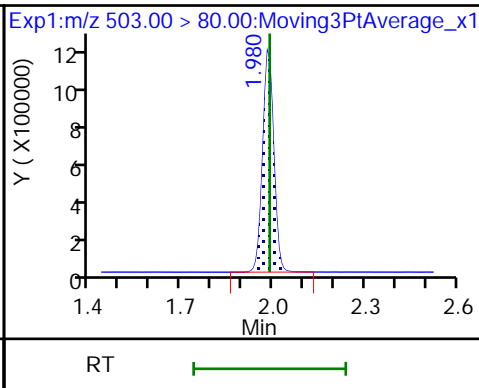
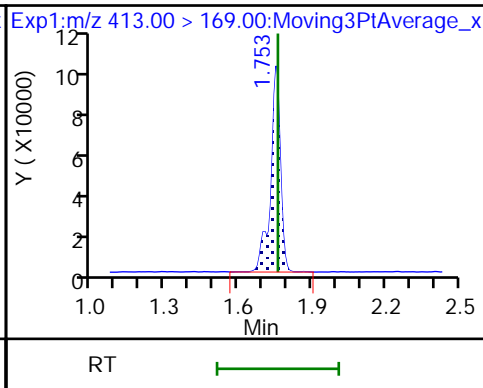
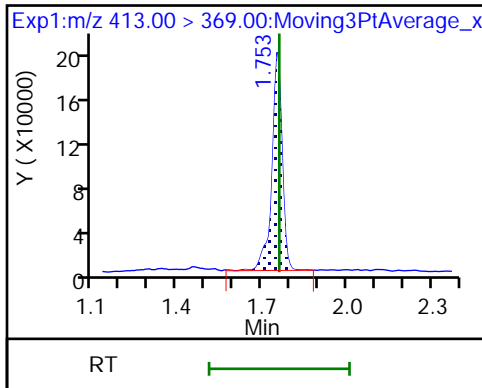
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

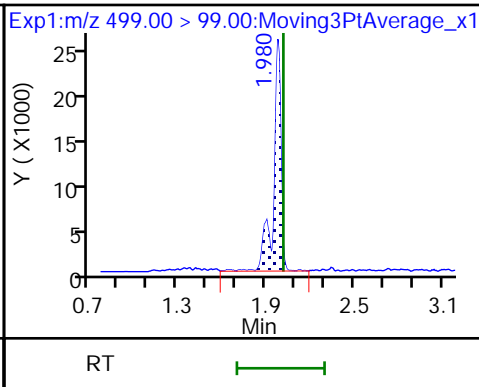
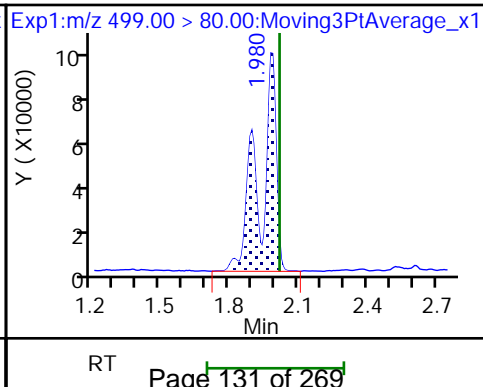
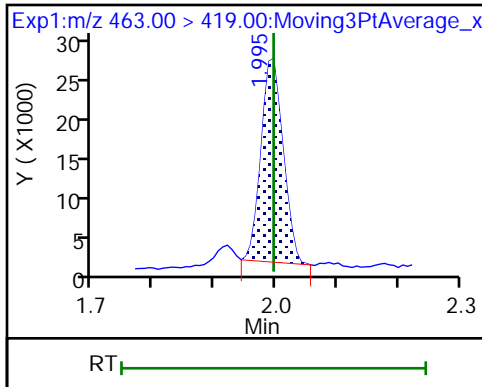
* 7 13C4 PFOS



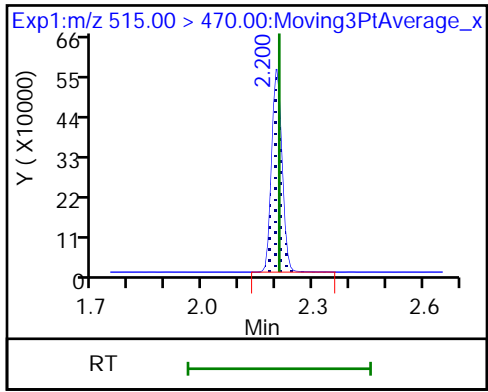
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_031.d
 Lims ID: 320-41679-A-5-A
 Client ID: NAWC-073118-RW-185
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:18:21 ALS Bottle#: 20 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-5-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 13:45:48

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.13	81.29
\$ 10 13C2 PFDA	10.0	9.40	93.98

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-FRB-185 Lab Sample ID: 320-41679-6
 Matrix: Water Lab File ID: 2018.08.07_537C_032.d
 Analysis Method: 537 Date Collected: 07/31/2018 11:05
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 244.6(mL) Date Analyzed: 08/08/2018 05:23
 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.: 238610 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	7.0
335-67-1	Perfluorooctanoic acid (PFOA)	8.2	U	20	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	20	U	25	20	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	103		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_032.d
 Lims ID: 320-41679-A-6-A
 Client ID: NAWC-073118-FRB-185
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:23:01 ALS Bottle#: 21 Worklist Smp#: 12
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-6-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.464	1.464	0.0	1.000	1266427	9.75	13555	
* 6 13C2-PFOA	415.00 > 370.00	1.760	1.760	0.0		1180694	10.0	7044	
* 7 13C4 PFOS	503.00 > 80.00	1.995	1.988	0.007		2717096	28.7	3454	
\$ 10 13C2 PFDA	515.00 > 470.00	2.208	2.208	0.0	1.000	997503	10.3	8018	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_032.d

Injection Date: 08-Aug-2018 05:23:01

Instrument ID: A8_N

Lims ID: 320-41679-A-6-A

Lab Sample ID: 320-41679-6

Client ID: NAWC-073118-FRB-185

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 21

Worklist Smp#: 12

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

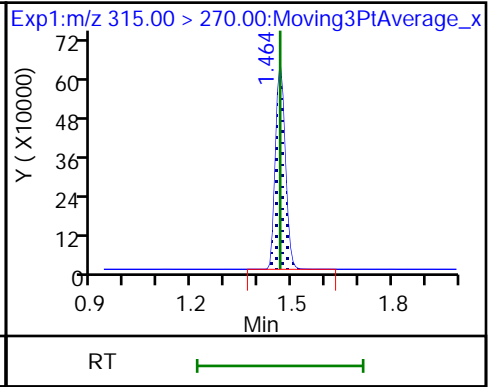
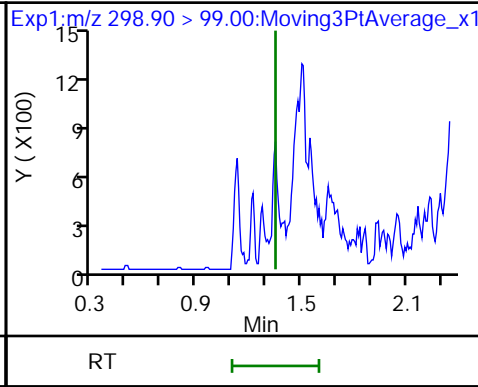
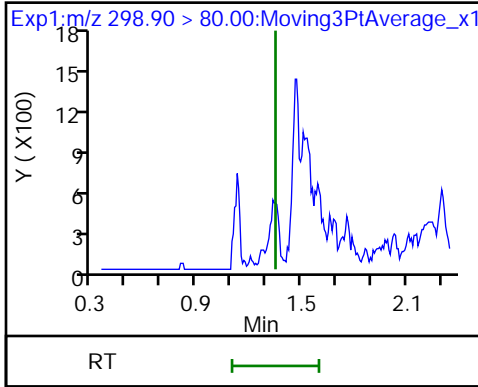
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

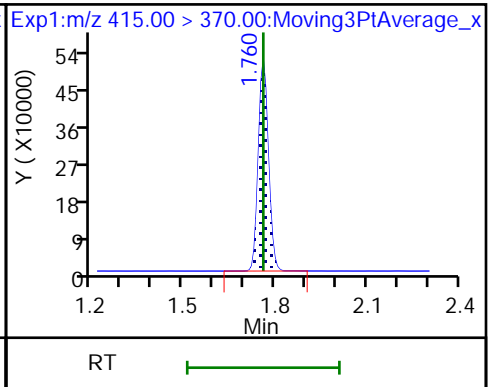
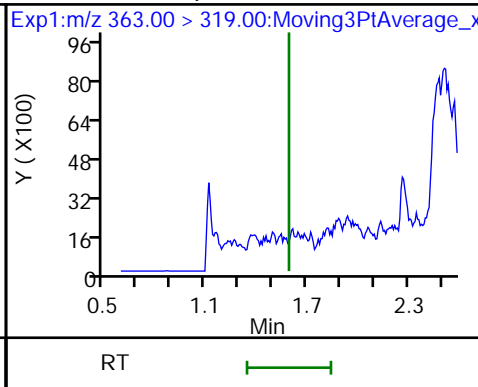
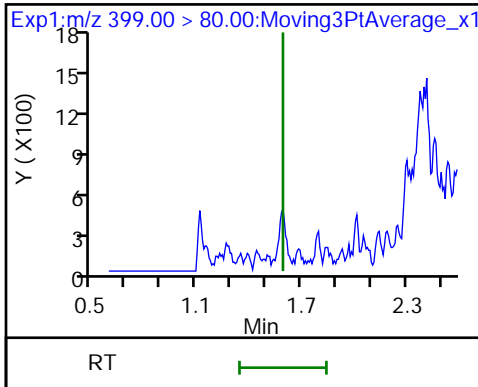
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

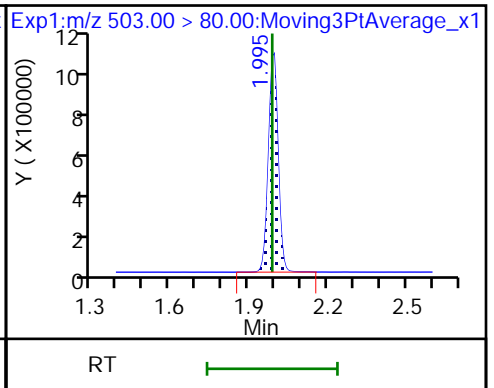
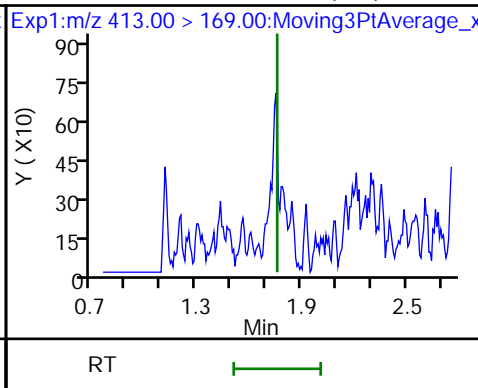
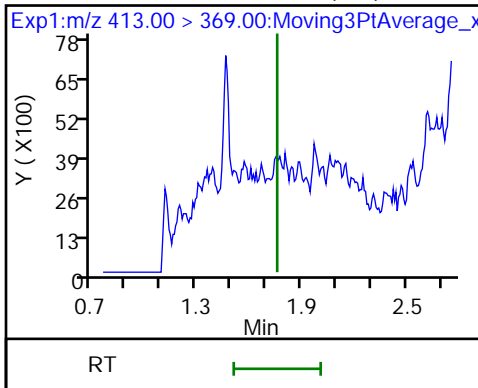
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

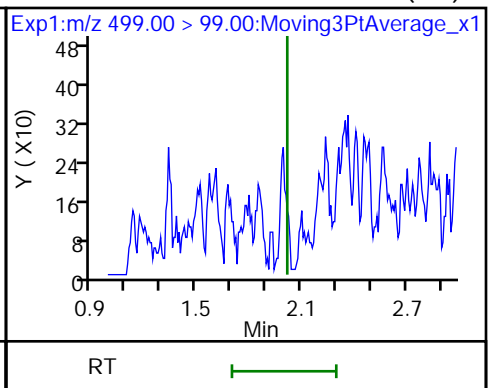
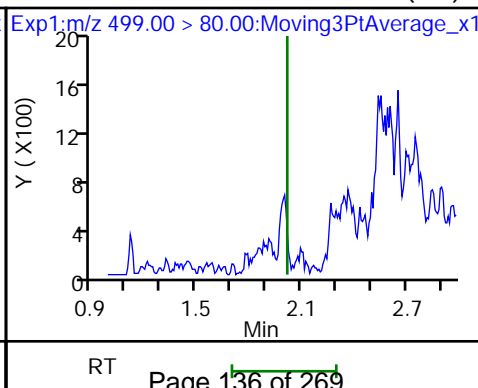
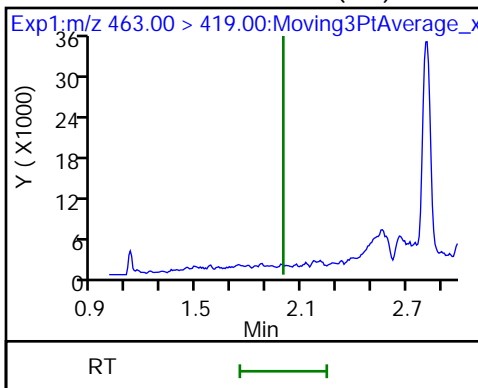
* 7 13C4 PFOS



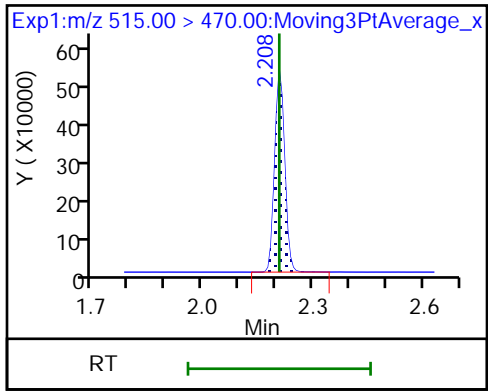
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_032.d
 Lims ID: 320-41679-A-6-A
 Client ID: NAWC-073118-FRB-185
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:23:01 ALS Bottle#: 21 Worklist Smp#: 12
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-6-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.75	97.54
\$ 10 13C2 PFDA	10.0	10.3	103.17

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-RW-179 Lab Sample ID: 320-41679-7
 Matrix: Water Lab File ID: 2018.08.07_537C_035.d
 Analysis Method: 537 Date Collected: 07/31/2018 12:10
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 257.9(mL) Date Analyzed: 08/08/2018 05:37
 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.: 238612 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	17	J	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	21		19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.1	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.0	J	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	87		70-130
STL00996	13C2 PFDA	101		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_035.d
 Lims ID: 320-41679-A-7-A
 Client ID: NAWC-073118-RW-179
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:37:01 ALS Bottle#: 22 Worklist Smp#: 15
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-7-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 13:46:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	167897	1.39		138	
298.90 > 99.00	1.350	1.350	0.0	1.000	111531		1.51(0.00-0.00)	163	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1272539	8.71		11485	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	332335	1.82		212	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.593	0.0	1.000	222908	1.56		31.9	
* 6 13C2-PFOA									
415.00 > 370.00	1.760	1.760	0.0		1328558	10.0		8386	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.760	1.760	0.0	1.000	784169	5.39		101	
413.00 > 169.00	1.760	1.760	0.0	1.000	436864		1.79(0.00-0.00)	861	
* 7 13C4 PFOS									
503.00 > 80.00	1.988	1.995	-0.007		2933682	28.7		2448	
9 Perfluorononanoic acid									
463.00 > 419.00	2.003	2.003	0.0	1.000	80268	0.7665		8.2	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	1.995	2.018	-0.023	1.000	500388	4.48		175	
499.00 > 99.00	1.988	2.018	-0.030	0.996	96555		5.18(0.00-0.00)	144	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.208	2.208	0.0	1.000	1096533	10.1		10001	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_035.d

Injection Date: 08-Aug-2018 05:37:01

Instrument ID: A8_N

Lims ID: 320-41679-A-7-A

Lab Sample ID: 320-41679-7

Client ID: NAWC-073118-RW-179

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 22

Worklist Smp#: 15

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

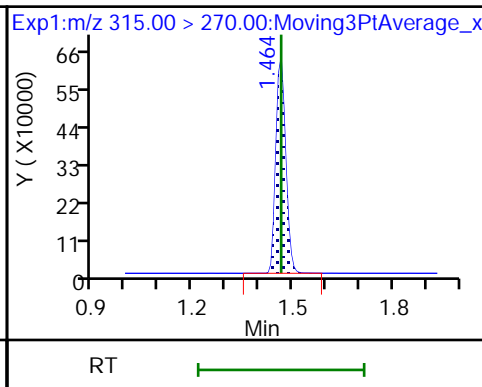
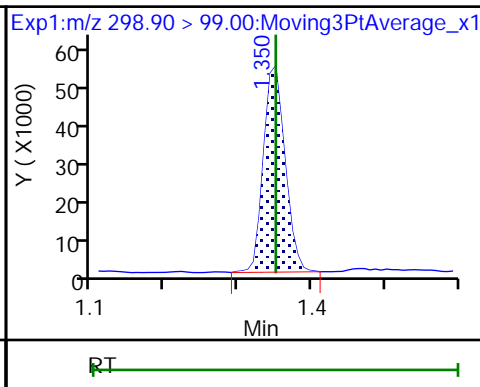
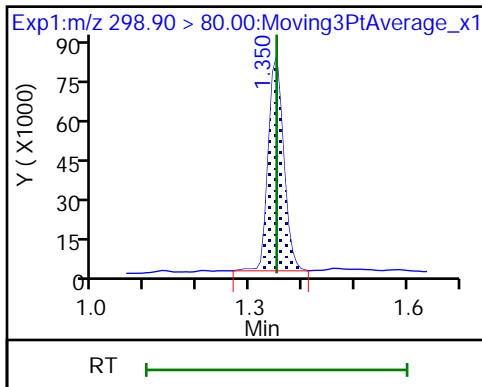
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

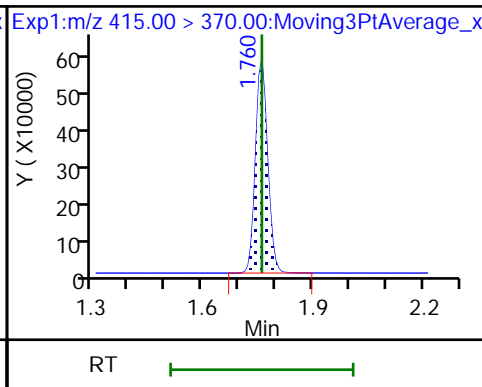
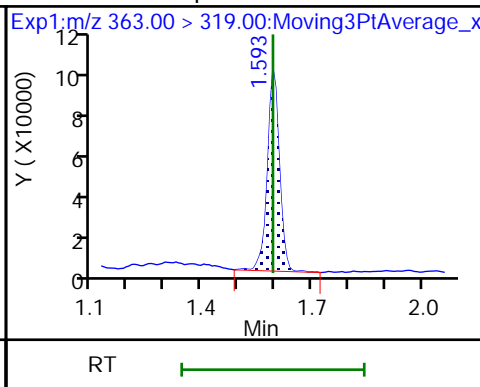
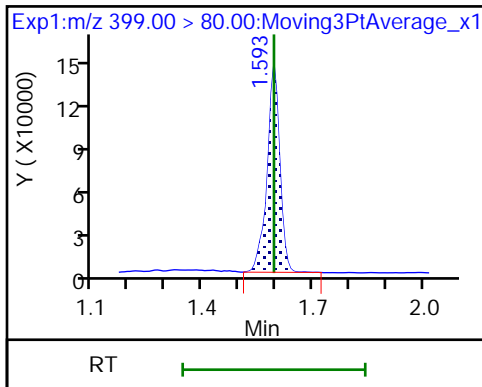
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

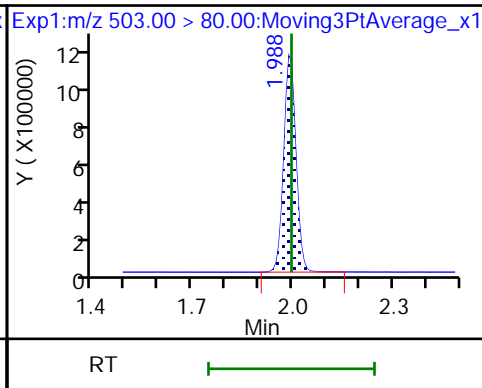
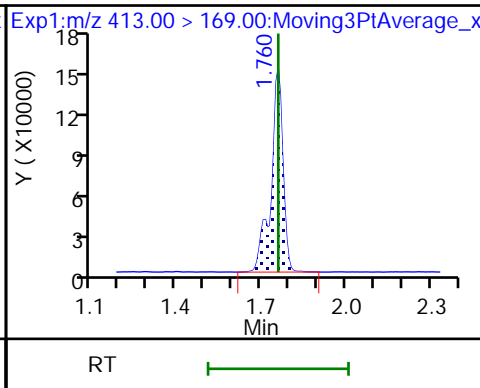
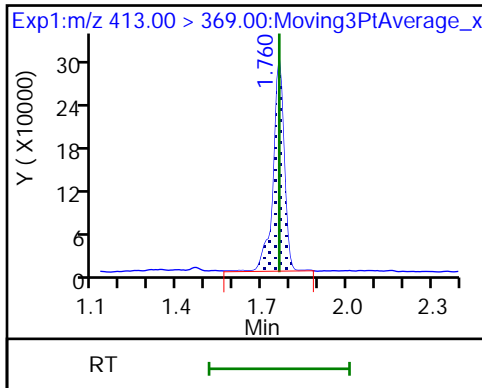
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

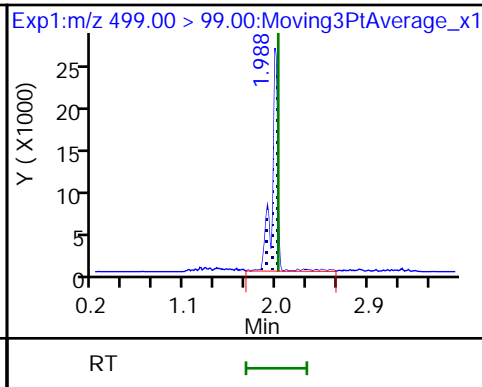
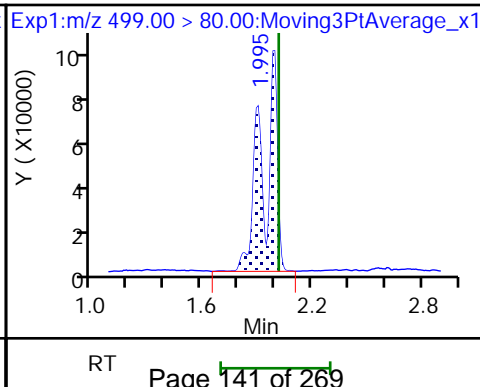
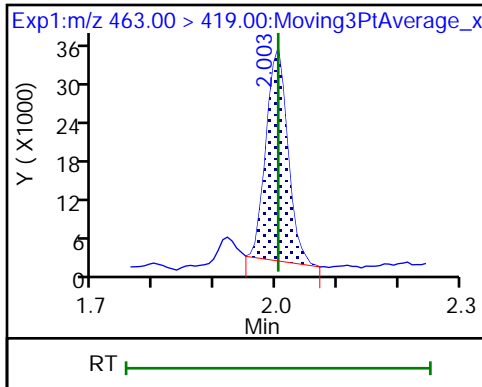
* 7 13C4 PFOS



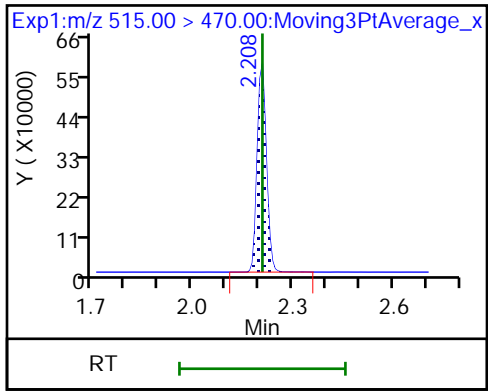
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_035.d
 Lims ID: 320-41679-A-7-A
 Client ID: NAWC-073118-RW-179
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:37:01 ALS Bottle#: 22 Worklist Smp#: 15
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-7-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 13:46:22

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.71	87.11
\$ 10 13C2 PFDA	10.0	10.1	100.79

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-FRB-179 Lab Sample ID: 320-41679-8
 Matrix: Water Lab File ID: 2018.08.07_537C_036.d
 Analysis Method: 537 Date Collected: 07/31/2018 12:05
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 252.9(mL) Date Analyzed: 08/08/2018 05:41
 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.: 238612 Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	101		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_036.d
 Lims ID: 320-41679-A-8-A
 Client ID: NAWC-073118-FRB-179
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:41:41 ALS Bottle#: 23 Worklist Smp#: 16
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-8-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.464	1.464	0.0	1.000	1280263	8.69	12361	
* 6 13C2-PFOA	415.00 > 370.00	1.760	1.760	0.0		1340148	10.0	8862	
* 7 13C4 PFOS	503.00 > 80.00	1.988	1.995	-0.007		2940104	28.7	3509	
\$ 10 13C2 PFDA	515.00 > 470.00	2.208	2.208	0.0	1.000	1111791	10.1	8861	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_036.d

Injection Date: 08-Aug-2018 05:41:41

Instrument ID: A8_N

Lims ID: 320-41679-A-8-A

Lab Sample ID: 320-41679-8

Client ID: NAWC-073118-FRB-179

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 23

Worklist Smp#: 16

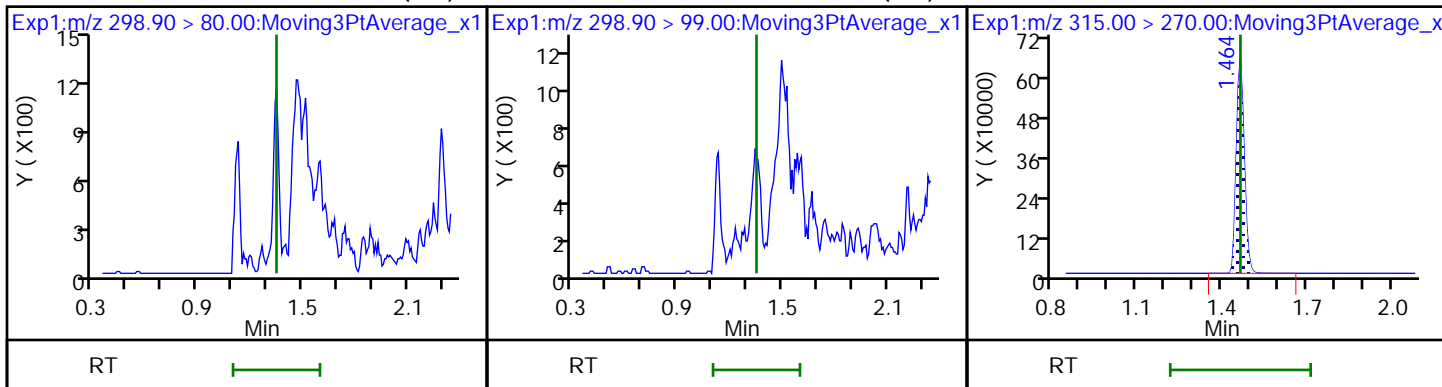
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

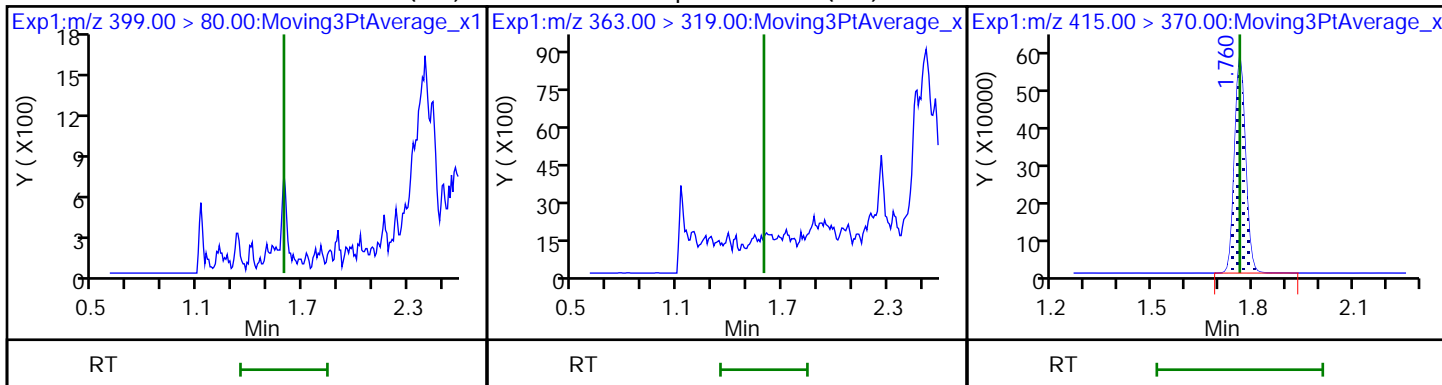
Method: 537_A8_N

Limit Group: LC 537 ICAL

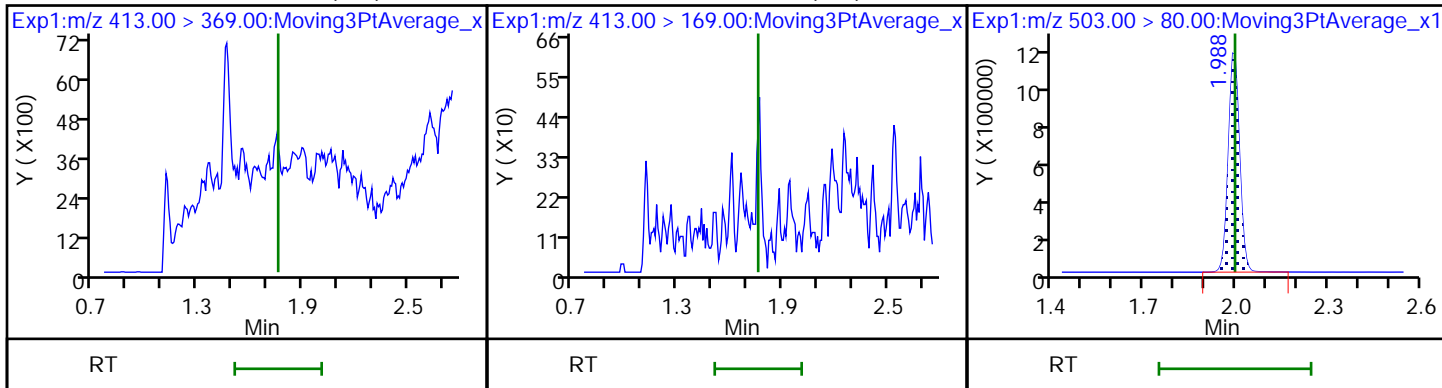
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



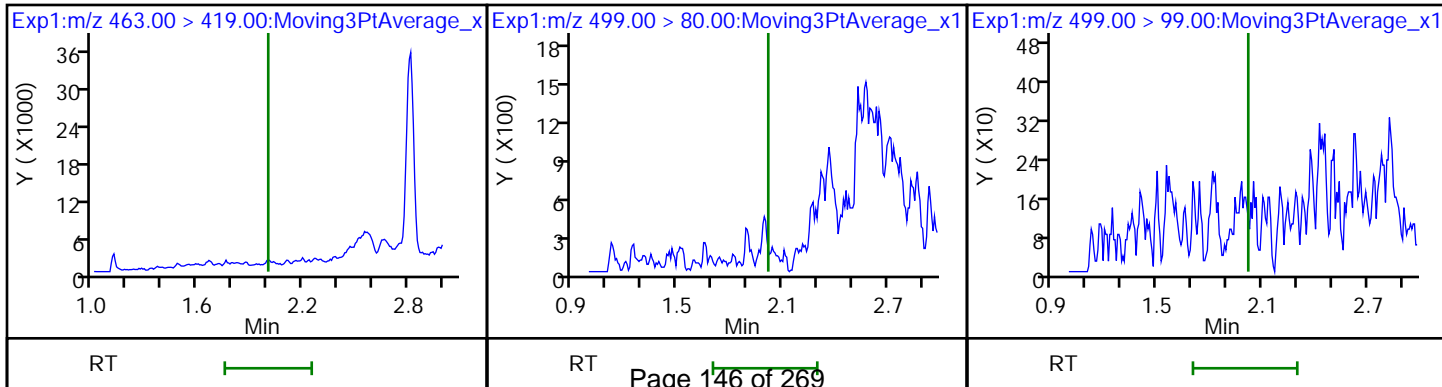
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



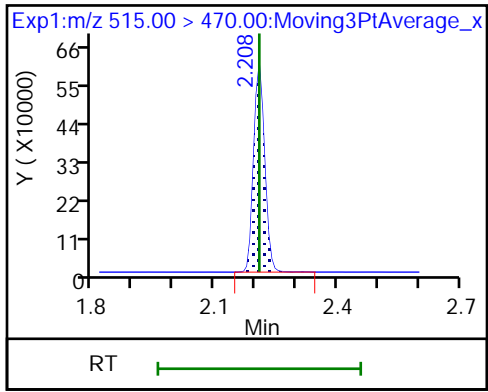
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) * 7 13C4 PFOS



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



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_036.d
 Lims ID: 320-41679-A-8-A
 Client ID: NAWC-073118-FRB-179
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:41:41 ALS Bottle#: 23 Worklist Smp#: 16
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-8-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.69	86.88
\$ 10 13C2 PFDA	10.0	10.1	101.31

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-RW-124 Lab Sample ID: 320-41679-9
 Matrix: Water Lab File ID: 2018.08.07_537C_037.d
 Analysis Method: 537 Date Collected: 07/31/2018 12:40
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 253.7(mL) Date Analyzed: 08/08/2018 05:46
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238612 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	31	J	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	20		20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	14	J	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.7	J	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	89	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	83		70-130
STL00996	13C2 PFDA	94		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_037.d
 Lims ID: 320-41679-A-9-A
 Client ID: NAWC-073118-RW-124
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:46:21 ALS Bottle#: 24 Worklist Smp#: 17
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-9-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 13:46:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	216646	1.66		147	
298.90 > 99.00	1.350	1.350	0.0	1.000	138765		1.56(0.00-0.00)	198	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1338054	8.30		13207	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	681084	3.46		397	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.593	0.0	1.000	189466	1.20		28.4	
* 6 13C2-PFOA									
415.00 > 370.00	1.760	1.760	0.0		1465526	10.0		10227	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.760	1.760	0.0	1.000	824045	5.13		99.3	
413.00 > 169.00	1.760	1.760	0.0	1.000	471423		1.75(0.00-0.00)	921	
* 7 13C4 PFOS									
503.00 > 80.00	1.995	1.995	0.0		3163107	28.7		2587	
9 Perfluorononanoic acid									
463.00 > 419.00	2.003	2.003	0.0	1.000	63656	0.5511		6.7	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	1.995	2.018	-0.023	1.000	934608	7.76		294	
499.00 > 99.00	1.995	2.018	-0.023	1.000	176008		5.31(0.00-0.00)	291	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.208	2.208	0.0	1.000	1130188	9.42		9140	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_037.d

Injection Date: 08-Aug-2018 05:46:21

Instrument ID: A8_N

Lims ID: 320-41679-A-9-A

Lab Sample ID: 320-41679-9

Client ID: NAWC-073118-RW-124

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 24

Worklist Smp#: 17

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

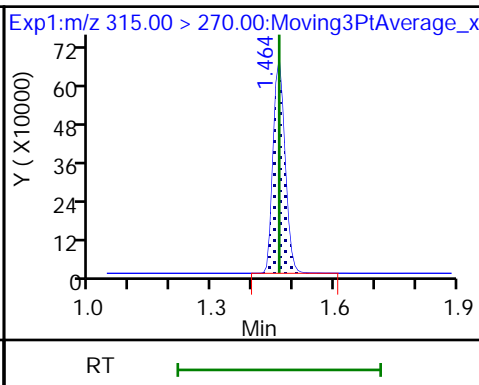
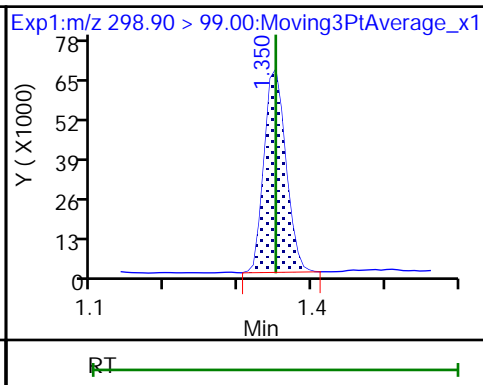
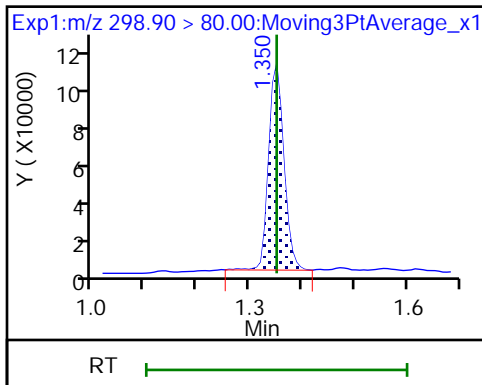
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

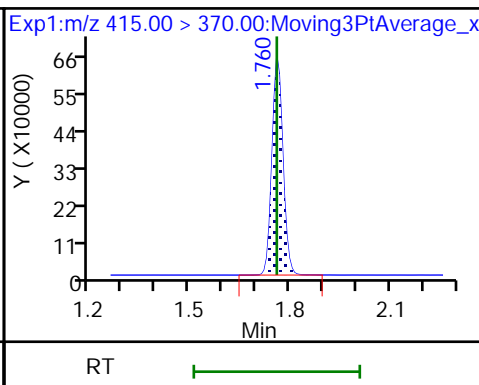
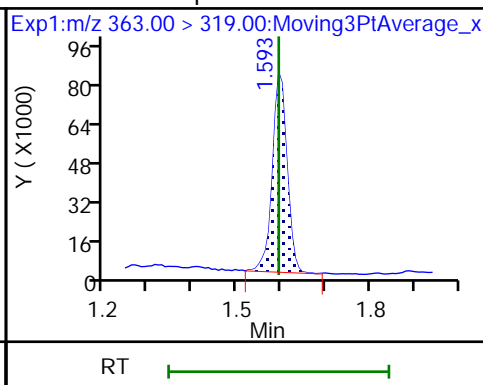
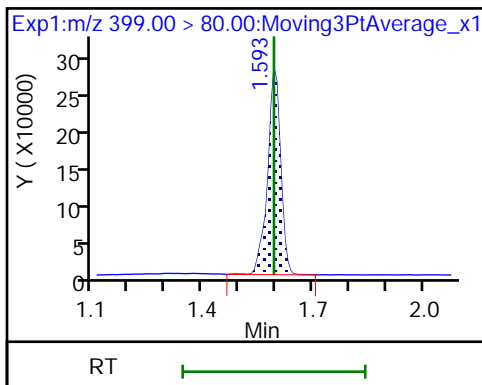
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

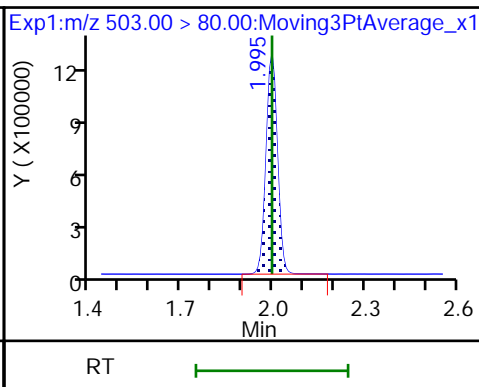
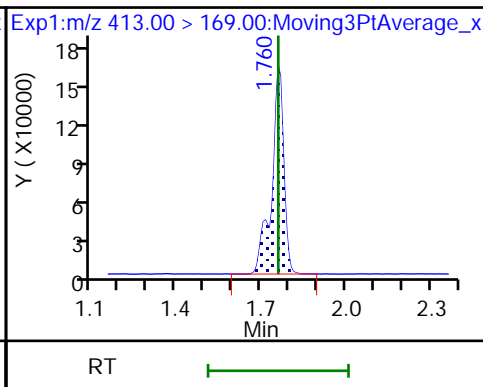
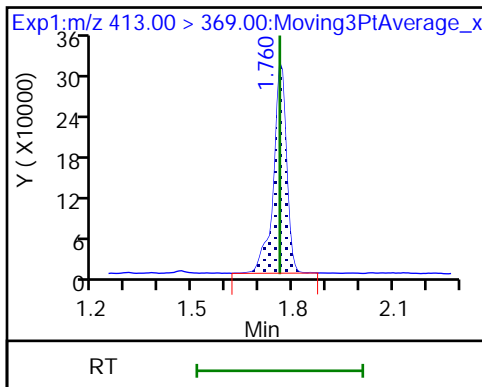
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

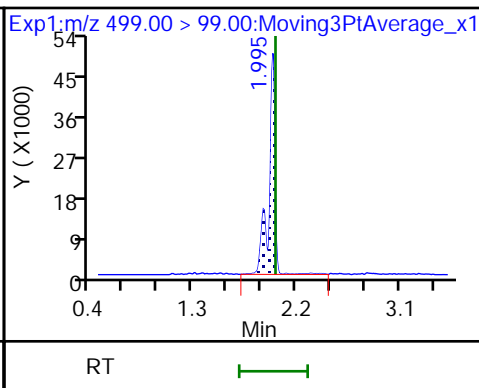
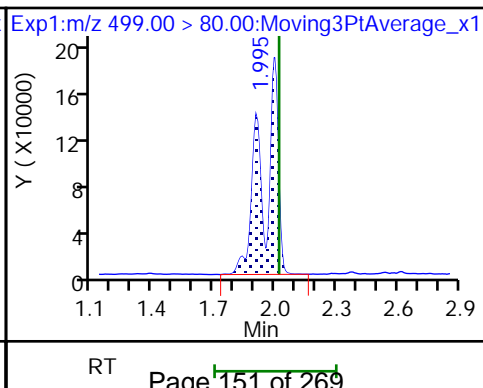
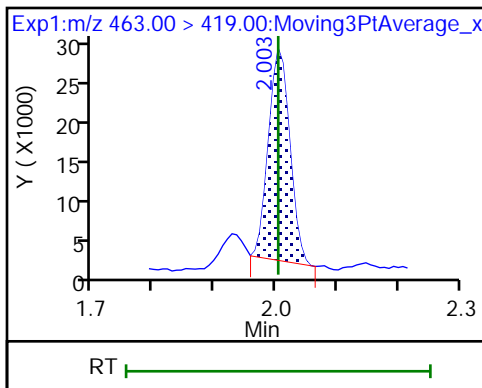
* 7 13C4 PFOS



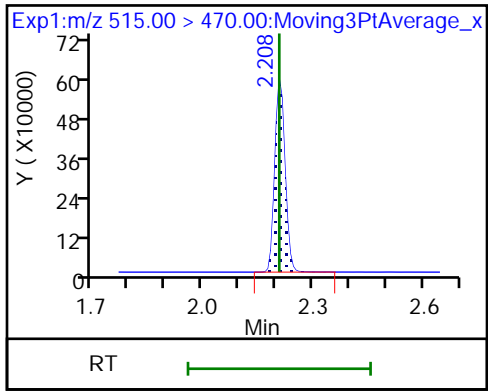
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_037.d
 Lims ID: 320-41679-A-9-A
 Client ID: NAWC-073118-RW-124
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:46:21 ALS Bottle#: 24 Worklist Smp#: 17
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-9-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 13:46:45

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.30	83.03
\$ 10 13C2 PFDA	10.0	9.42	94.18

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-FRB-124 Lab Sample ID: 320-41679-10
 Matrix: Water Lab File ID: 2018.08.07_537C_038.d
 Analysis Method: 537 Date Collected: 07/31/2018 12:35
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 254.5 (mL) Date Analyzed: 08/08/2018 05:51
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238612 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.8	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	91		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_038.d
 Lims ID: 320-41679-A-10-A
 Client ID: NAWC-073118-FRB-124
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:51:01 ALS Bottle#: 25 Worklist Smp#: 18
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-10-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.464	1.464	0.0	1.000	1256150	8.66	11481	
* 6 13C2-PFOA	415.00 > 370.00	1.760	1.760	0.0		1319545	10.0	8299	
* 7 13C4 PFOS	503.00 > 80.00	1.988	1.995	-0.007		2963050	28.7	3539	
\$ 10 13C2 PFDA	515.00 > 470.00	2.208	2.208	0.0	1.000	980100	9.07	7113	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_038.d

Injection Date: 08-Aug-2018 05:51:01

Instrument ID: A8_N

Lims ID: 320-41679-A-10-A

Lab Sample ID: 320-41679-10

Client ID: NAWC-073118-FRB-124

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 25

Worklist Smp#: 18

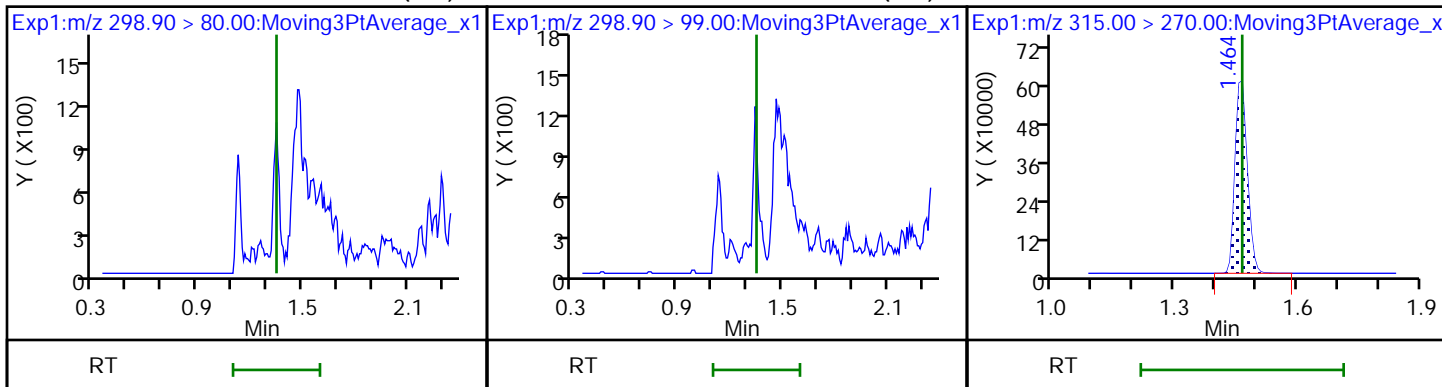
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

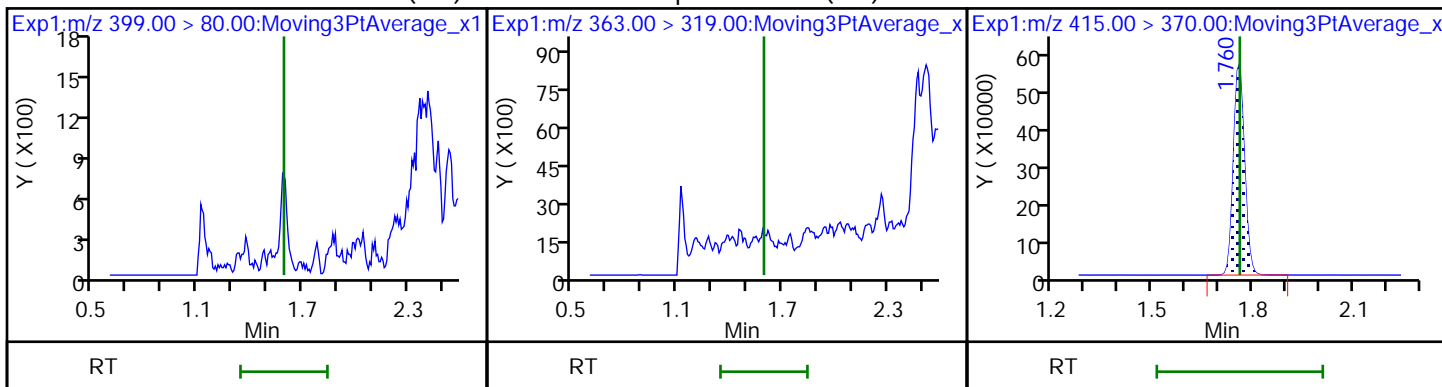
Method: 537_A8_N

Limit Group: LC 537 ICAL

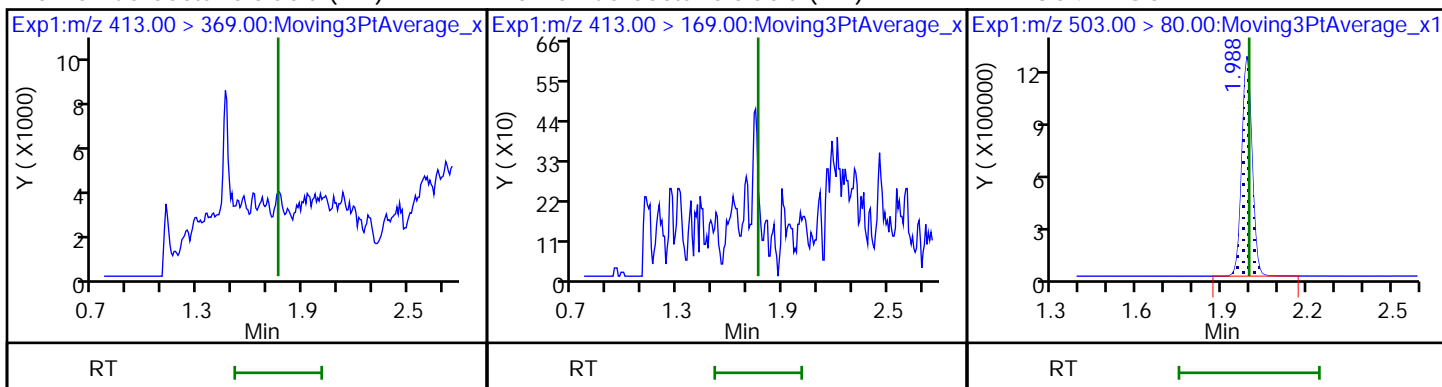
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



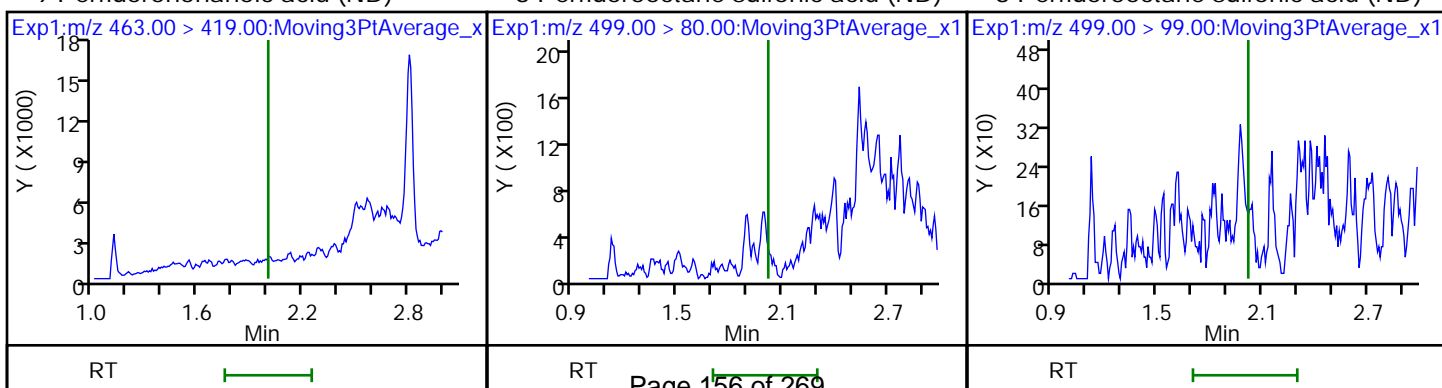
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



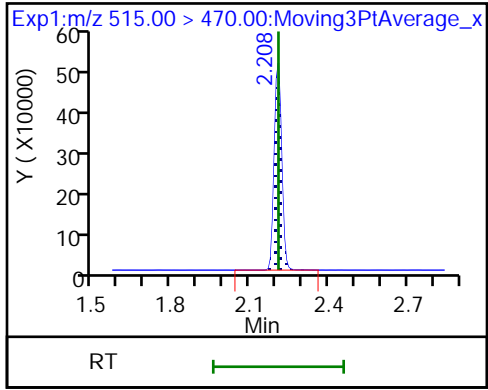
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) * 7 13C4 PFOS



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



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_038.d
 Lims ID: 320-41679-A-10-A
 Client ID: NAWC-073118-FRB-124
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:51:01 ALS Bottle#: 25 Worklist Smp#: 18
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-10-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.66	86.57
\$ 10 13C2 PFDA	10.0	9.07	90.71

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: WGNA-073118-RW-3103 Lab Sample ID: 320-41679-11
 Matrix: Water Lab File ID: 2018.08.07_537C_039.d
 Analysis Method: 537 Date Collected: 07/31/2018 13:40
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 259.2 (mL) Date Analyzed: 08/08/2018 05:55
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238612 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	7.1	J	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	8.3	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	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.4	J M	9.6	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U M	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	99		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_039.d
 Lims ID: 320-41679-A-11-A
 Client ID: WGNA-073118-RW-3103
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:55:42 ALS Bottle#: 26 Worklist Smp#: 19
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-11-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 13:47:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.343	1.350	-0.007	1.000	112695	1.09		91.0	M
298.90 > 99.00	1.343	1.350	-0.007	1.000	75927		1.48(0.00-0.00)	115	M
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.457	1.464	-0.007	1.000	1111564	8.98		11188	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	192115	1.24		127	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.593	0.0	1.000	75617	0.6248		11.8	M
* 6 13C2-PFOA									
415.00 > 370.00	1.753	1.760	-0.007		1125238	10.0		6944	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.760	1.760	0.0	1.000	264518	2.15		32.2	
413.00 > 169.00	1.760	1.760	0.0	1.000	151376		1.75(0.00-0.00)	293	
* 7 13C4 PFOS									
503.00 > 80.00	1.988	1.995	-0.007		2495650	28.7		2450	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	1.988	2.018	-0.030	1.000	175394	1.85		54.1	
499.00 > 99.00	1.988	2.018	-0.030	1.000	32854		5.34(0.00-0.00)	52.5	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.208	2.208	0.0	1.000	908228	9.86		6606	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_039.d

Injection Date: 08-Aug-2018 05:55:42

Instrument ID: A8_N

Lims ID: 320-41679-A-11-A

Lab Sample ID: 320-41679-11

Client ID: WGNA-073118-RW-3103

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 26

Worklist Smp#: 19

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

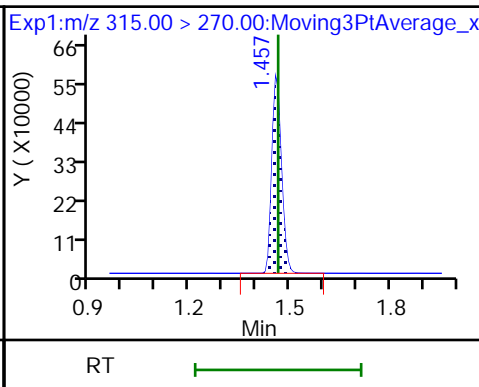
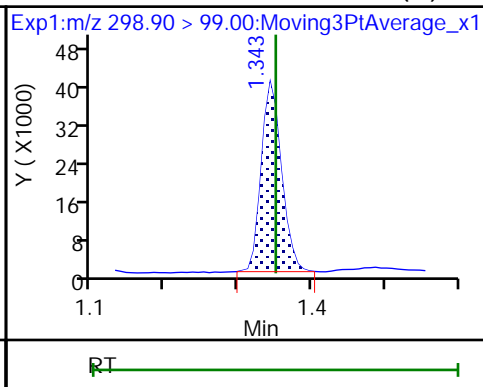
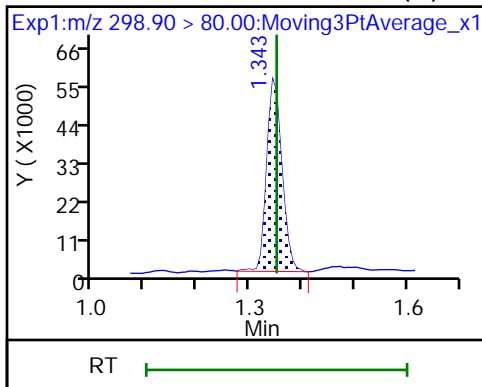
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (M)

1 Perfluorobutanesulfonic acid (M)

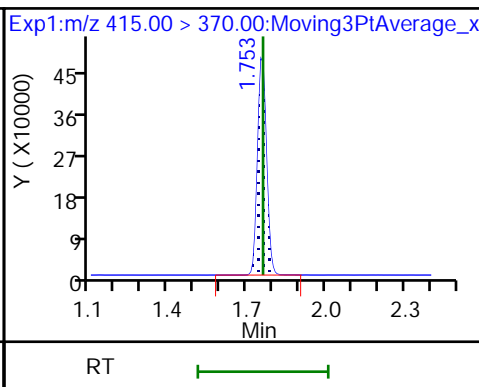
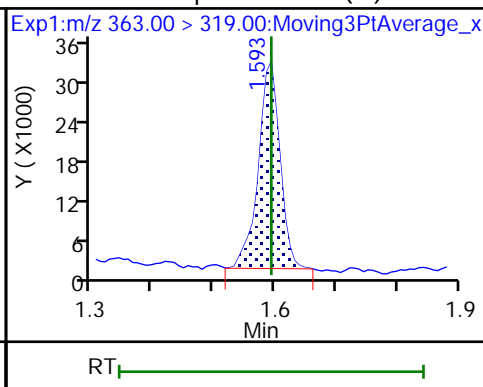
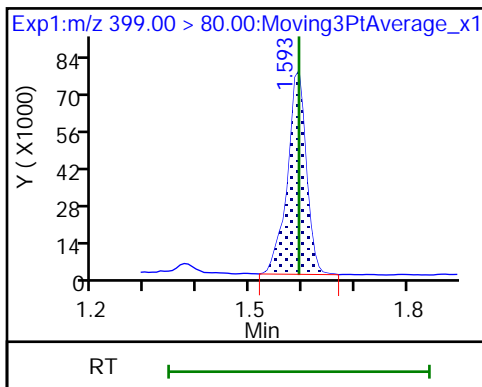
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid (M)

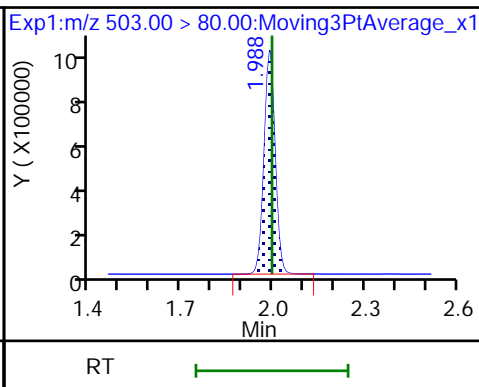
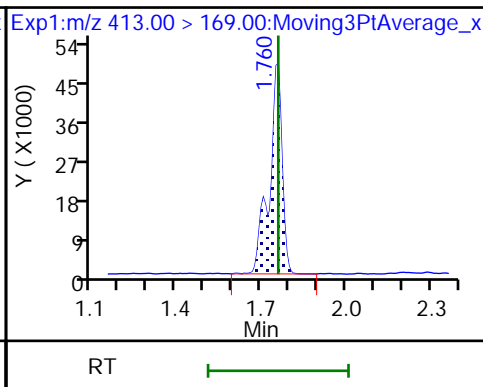
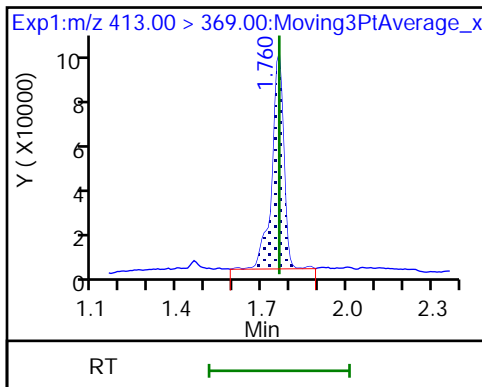
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

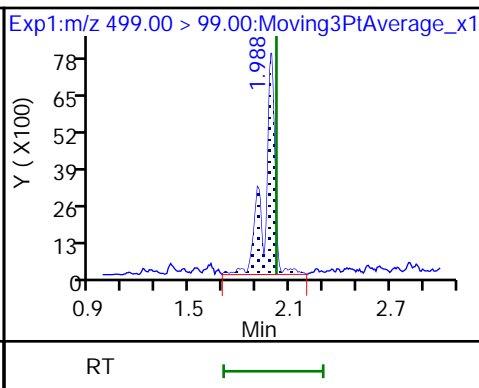
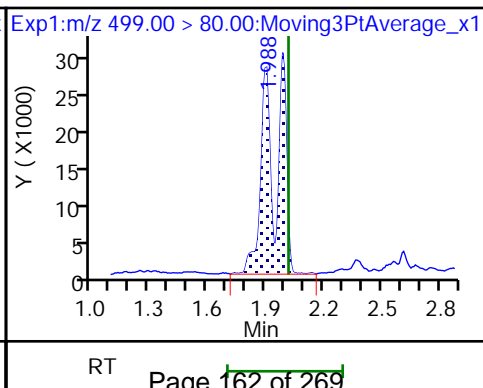
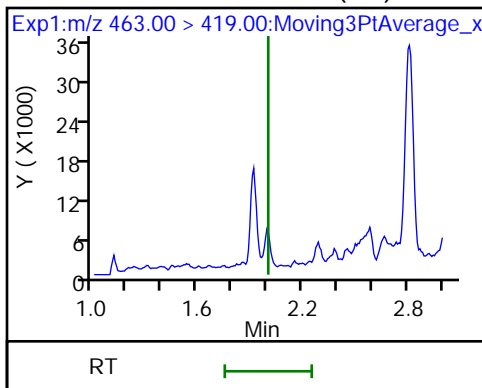
* 7 13C4 PFOS



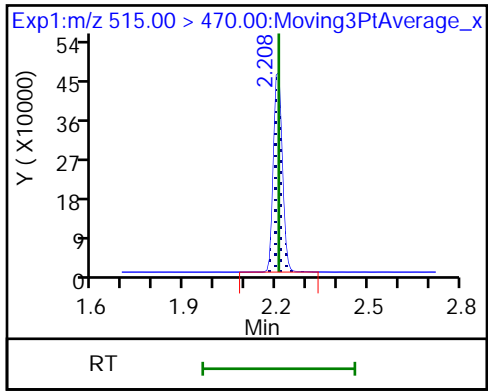
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_039.d
 Lims ID: 320-41679-A-11-A
 Client ID: WGNA-073118-RW-3103
 Sample Type: Client
 Inject. Date: 08-Aug-2018 05:55:42 ALS Bottle#: 26 Worklist Smp#: 19
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-11-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 13:47:45

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.98	89.84
\$ 10 13C2 PFDA	10.0	9.86	98.57

TestAmerica Sacramento

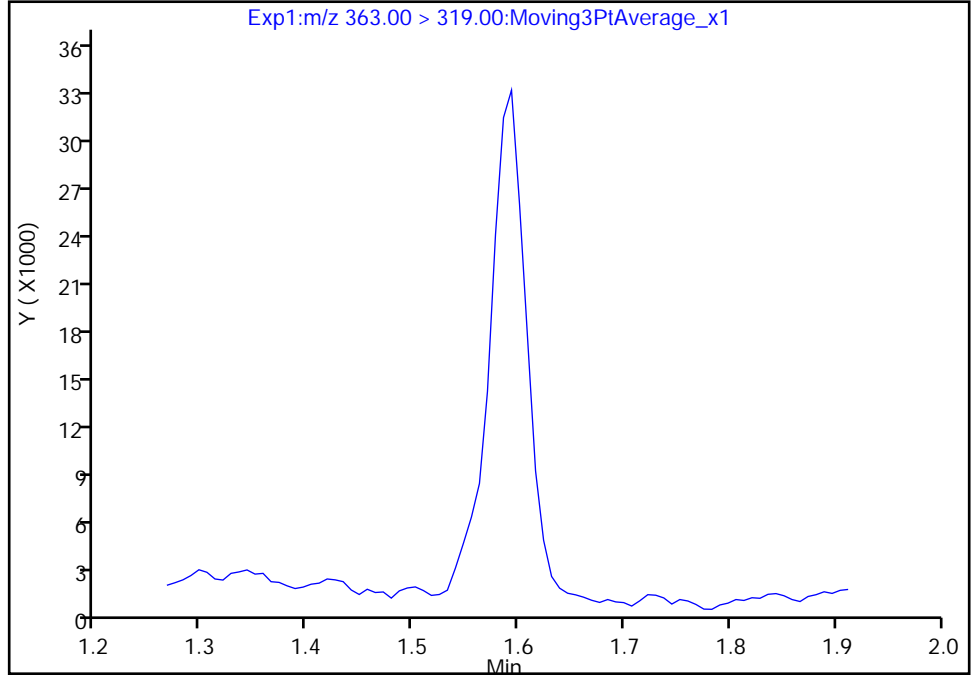
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_039.d
Injection Date: 08-Aug-2018 05:55:42 Instrument ID: A8_N
Lims ID: 320-41679-A-11-A Lab Sample ID: 320-41679-11
Client ID: WGNA-073118-RW-3103
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 26 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

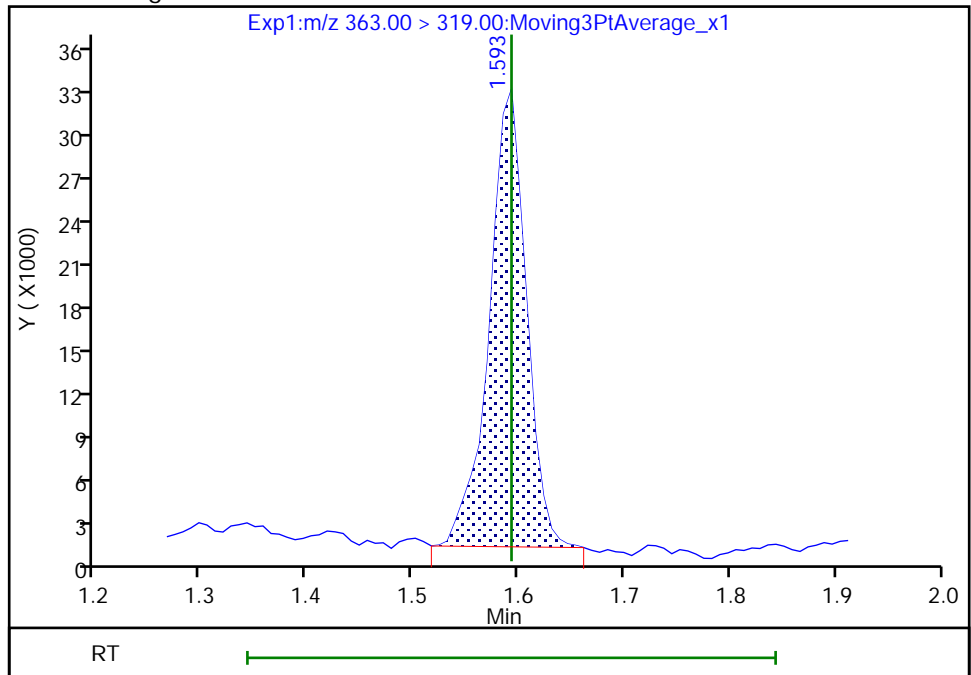
Not Detected
Expected RT: 1.59

Processing Integration Results



Manual Integration Results

RT: 1.59
Area: 75617
Amount: 0.624757
Amount Units: ng/ml



Reviewer: barnettj, 08-Aug-2018 13:47:28
Audit Action: Manually Integrated

Audit Reason: Missed Peak
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TestAmerica Sacramento

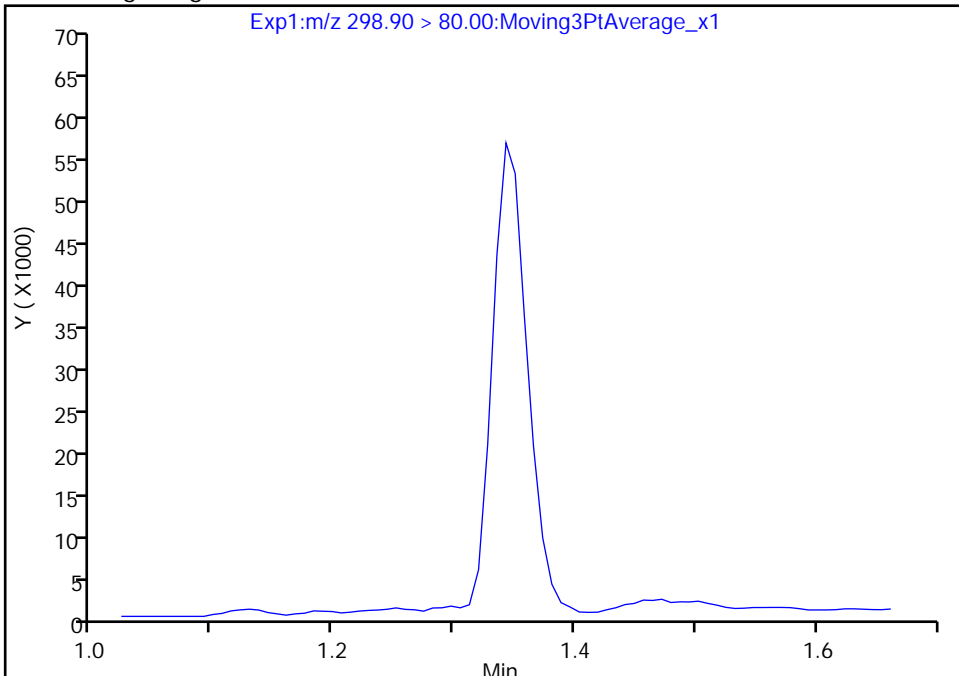
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_039.d
Injection Date: 08-Aug-2018 05:55:42 Instrument ID: A8_N
Lims ID: 320-41679-A-11-A Lab Sample ID: 320-41679-11
Client ID: WGNA-073118-RW-3103
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 26 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

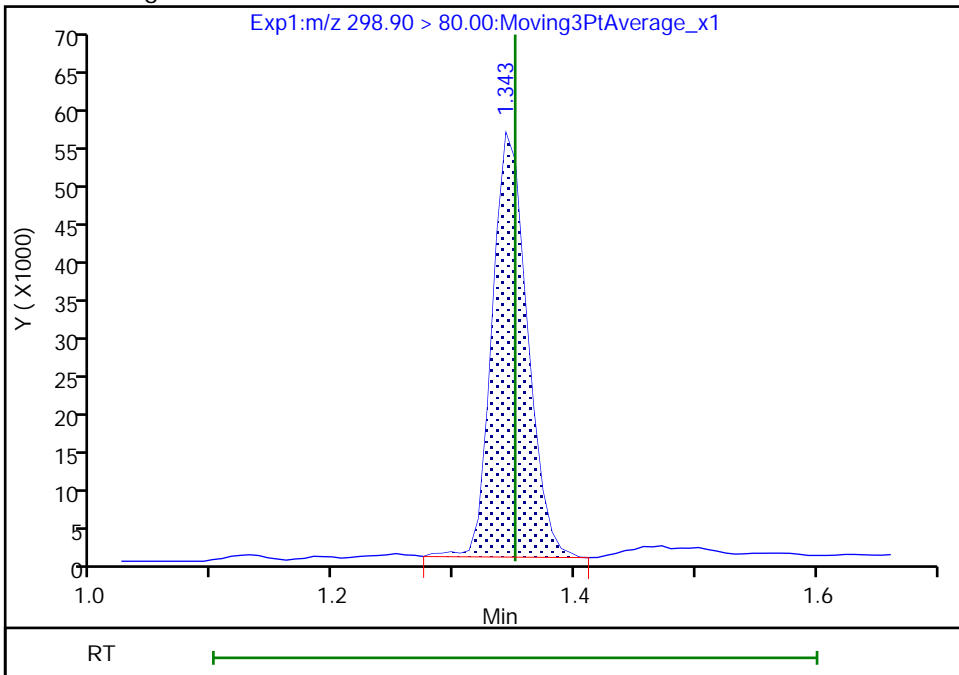
Not Detected
Expected RT: 1.35

Processing Integration Results



Manual Integration Results

RT: 1.34
Area: 112695
Amount: 1.093625
Amount Units: ng/ml



TestAmerica Sacramento

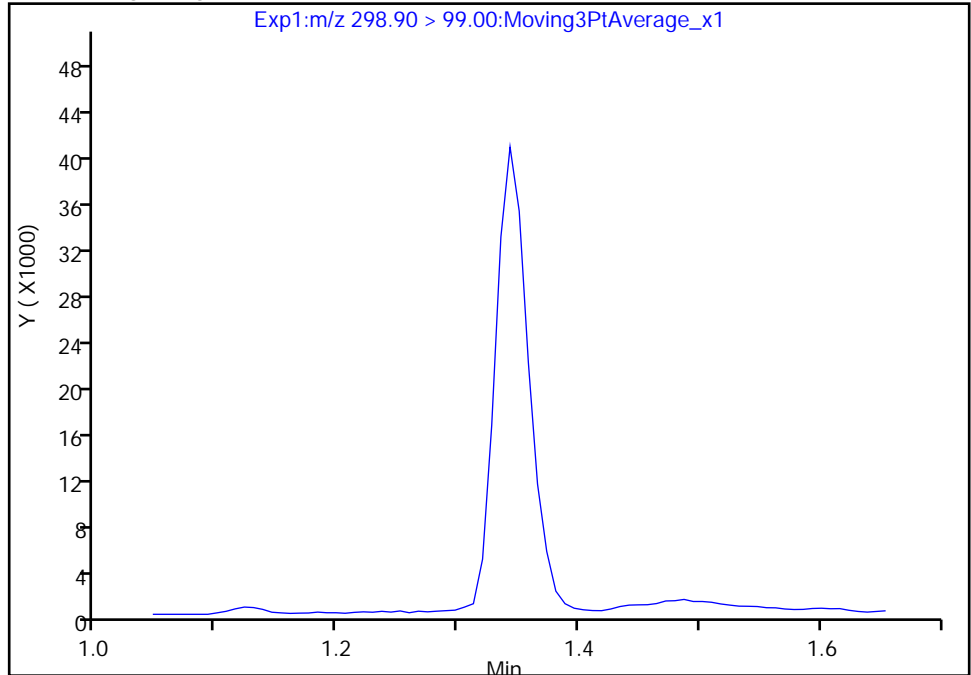
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_039.d
Injection Date: 08-Aug-2018 05:55:42 Instrument ID: A8_N
Lims ID: 320-41679-A-11-A Lab Sample ID: 320-41679-11
Client ID: WGNA-073118-RW-3103
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 26 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

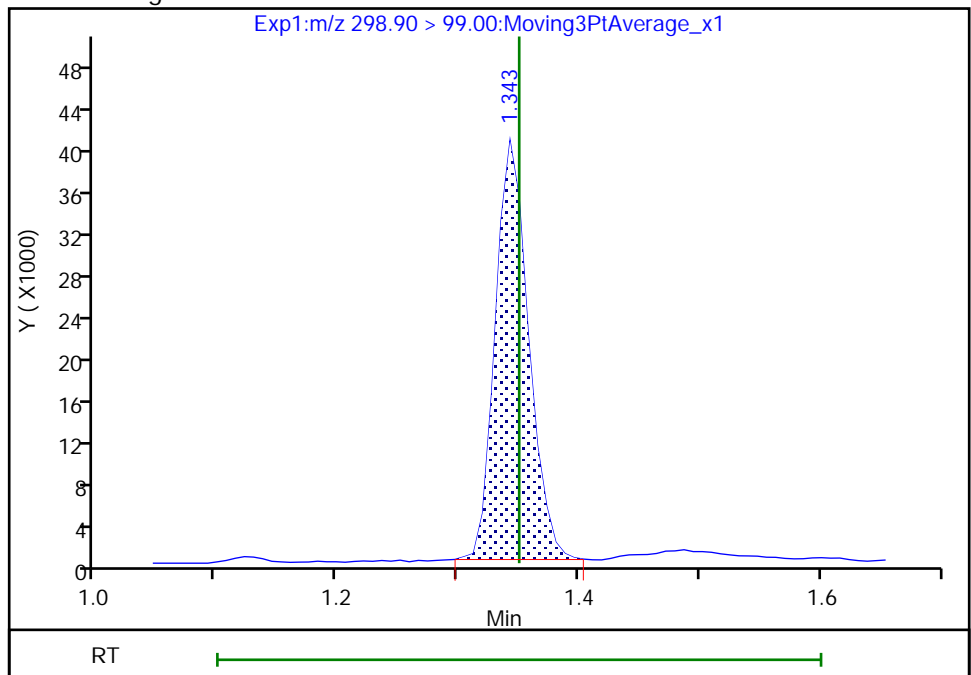
Not Detected
Expected RT: 1.35

Processing Integration Results



Manual Integration Results

RT: 1.34
Area: 75927
Amount: 1.093625
Amount Units: ng/ml



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: WGNA-073118-FRB-3103 Lab Sample ID: 320-41679-12
 Matrix: Water Lab File ID: 2018.08.07_537C_040.d
 Analysis Method: 537 Date Collected: 07/31/2018 13:35
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 260.7(mL) Date Analyzed: 08/08/2018 06:00
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238612 Units: ng/L

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)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	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	85		70-130
STL00996	13C2 PFDA	92		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_040.d
 Lims ID: 320-41679-A-12-A
 Client ID: WGNA-073118-FRB-3103
 Sample Type: Client
 Inject. Date: 08-Aug-2018 06:00:22 ALS Bottle#: 27 Worklist Smp#: 20
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-12-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.464	1.464	0.0	1.000	1107076	8.53	10869	
* 6 13C2-PFOA	415.00 > 370.00	1.760	1.760	0.0		1179781	10.0	8000	
* 7 13C4 PFOS	503.00 > 80.00	1.988	1.995	-0.007		2532682	28.7	3122	
\$ 10 13C2 PFDA	515.00 > 470.00	2.208	2.208	0.0	1.000	885020	9.16	8267	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_040.d

Injection Date: 08-Aug-2018 06:00:22

Instrument ID: A8_N

Lims ID: 320-41679-A-12-A

Lab Sample ID: 320-41679-12

Client ID: WGNA-073118-FRB-3103

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 27

Worklist Smp#: 20

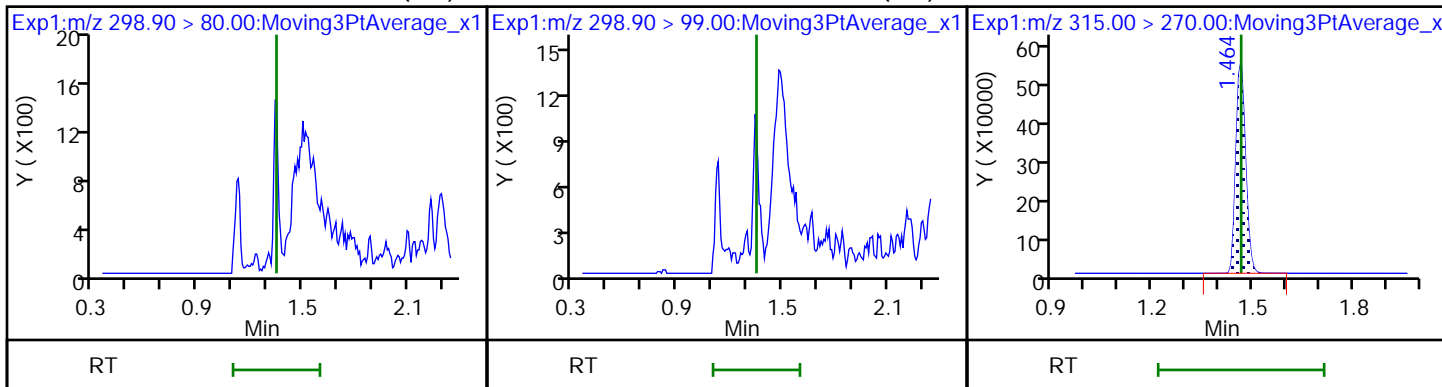
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

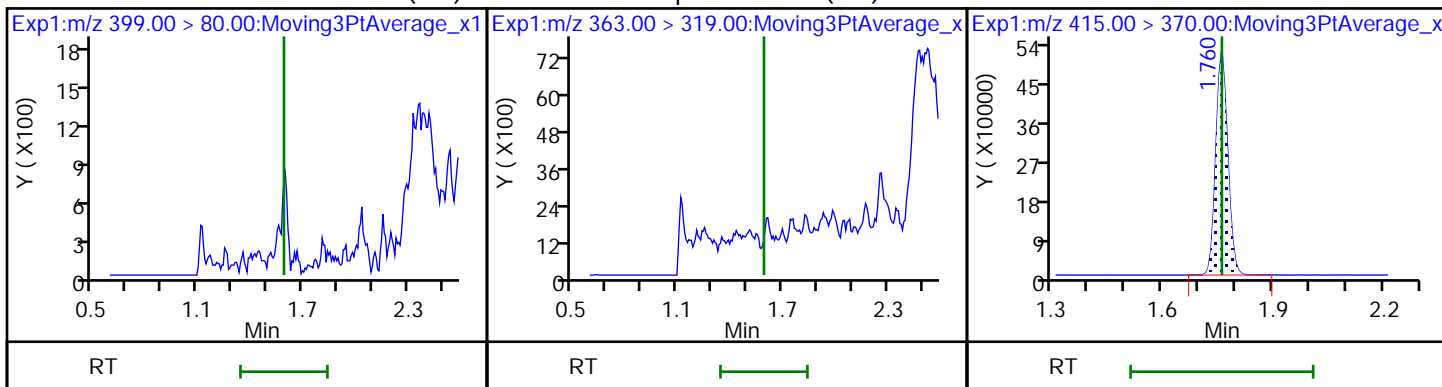
Method: 537_A8_N

Limit Group: LC 537 ICAL

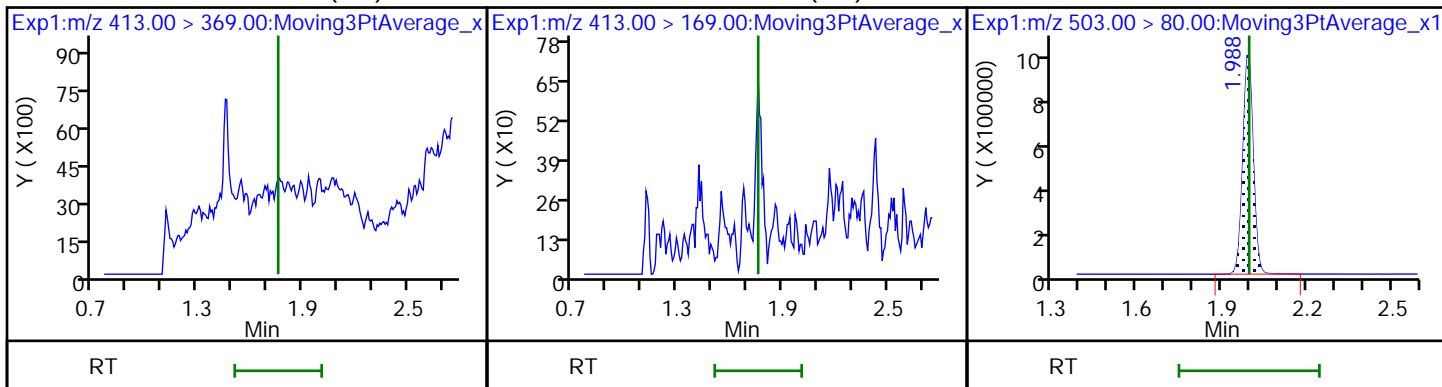
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



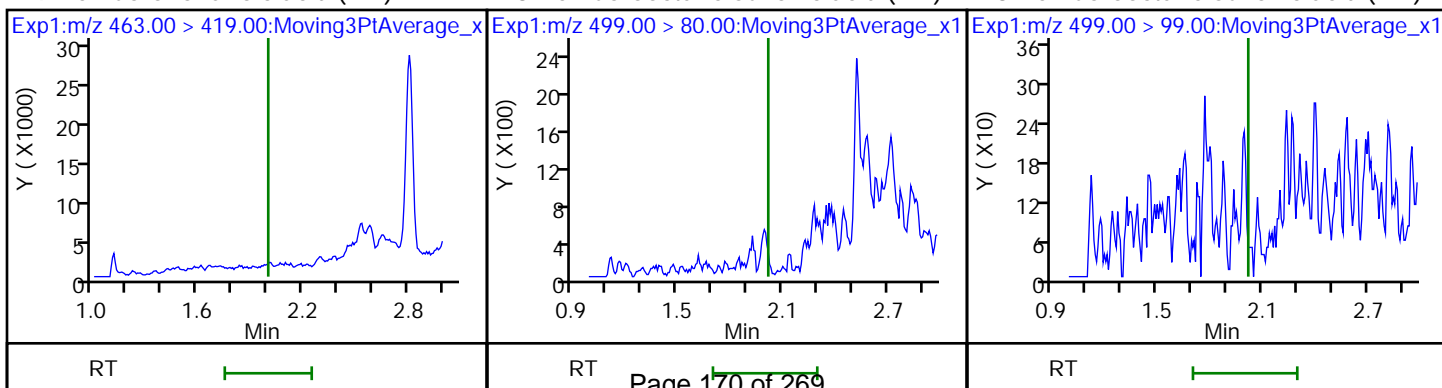
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



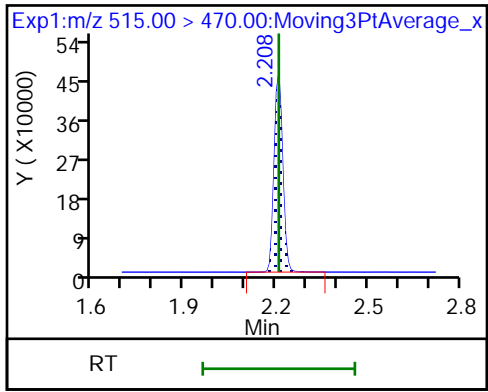
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) * 7 13C4 PFOS



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



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_040.d
 Lims ID: 320-41679-A-12-A
 Client ID: WGNA-073118-FRB-3103
 Sample Type: Client
 Inject. Date: 08-Aug-2018 06:00:22 ALS Bottle#: 27 Worklist Smp#: 20
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-12-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.53	85.34
\$ 10 13C2 PFDA	10.0	9.16	91.61

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

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1 Analy Batch No.: 238469

SDG No.: _____

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

Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238469/2	2018.08.07_537CURVE_003.d
Level 2	IC 320-238469/3	2018.08.07_537CURVE_004.d
Level 3	IC 320-238469/4	2018.08.07_537CURVE_005.d
Level 4	IC 320-238469/5	2018.08.07_537CURVE_006.d
Level 5	IC 320-238469/6	2018.08.07_537CURVE_007.d
Level 6	IC 320-238469/7	2018.08.07_537CURVE_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	1.2685 1.0148	1.2167	1.2831	1.2045	1.1178	Ave		1.1842			8.6		30.0				
Perfluorohexanesulfonic acid (PFHxS)	1.7386 1.7965	1.7248	1.7859	1.8499	1.8020	Ave		1.7830			2.6		30.0				
Perfluoroheptanoic acid (PFHpA)	+++++ 1.0701	1.0598	1.0963	1.0908	1.0612	Ave		1.0756			1.6		30.0				
Perfluorooctanoic acid (PFOA)	1.1708 1.0787	1.0454	1.0799	1.1146	1.0831	Ave		1.0954			3.9		30.0				
Perfluorooctanesulfonic acid (PFOS)	1.0605 1.1104	1.0466	1.1058	1.0956	1.1304	Ave		1.0915			2.9		30.0				
Perfluorononanoic acid (PFNA)	0.7952 0.7829	0.7632	0.7779	0.8207	0.7892	Ave		0.7882			2.5		30.0				
13C2 PFHxA	1.1215 1.1209	1.0683	1.0729	1.1134	1.1007	Ave		1.0996			2.2		30.0				
13C2 PFDA	0.8149 0.8273	0.8350	0.7672	0.8515	0.8172	Ave		0.8189			3.5		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.: 320-41679-1 Analy Batch No.: 238469

SDG No.: _____

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

Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238469/2	2018.08.07_537CURVE_003.d
Level 2	IC 320-238469/3	2018.08.07_537CURVE_004.d
Level 3	IC 320-238469/4	2018.08.07_537CURVE_005.d
Level 4	IC 320-238469/5	2018.08.07_537CURVE_006.d
Level 5	IC 320-238469/6	2018.08.07_537CURVE_007.d
Level 6	IC 320-238469/7	2018.08.07_537CURVE_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	1093854 16487048	2326382	5241287	9203217	13659010	9.00 180	20.0	45.0	90.1	135
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	500314 9803009	1107645	2450188	4747515	7395512	3.00 60.5	6.72	15.1	30.2	45.4
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	++++ 2459664	275735	621773	1128009	1828933	++++ 19.4	2.16	4.86	9.72	14.6
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	277484 5050799	554036	1247621	2347790	3802739	1.98 39.6	4.40	9.90	19.8	29.7
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	401757 7918924	878368	1982811	3674504	6063022	3.95 79.1	8.79	19.8	39.5	59.3
Perfluorononanoic acid (PFNA)	13PF OA	Ave	188460 3665889	404484	898787	1728770	2770632	1.98 39.6	4.40	9.90	19.8	29.7
13C2 PFHxA	13PF OA	Ave	1342383 1325342	1286815	1252048	1184544	1301097	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	975454 978205	1005796	895349	905914	965975	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD

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

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1 Analy Batch No.: 238469

SDG No.: _____

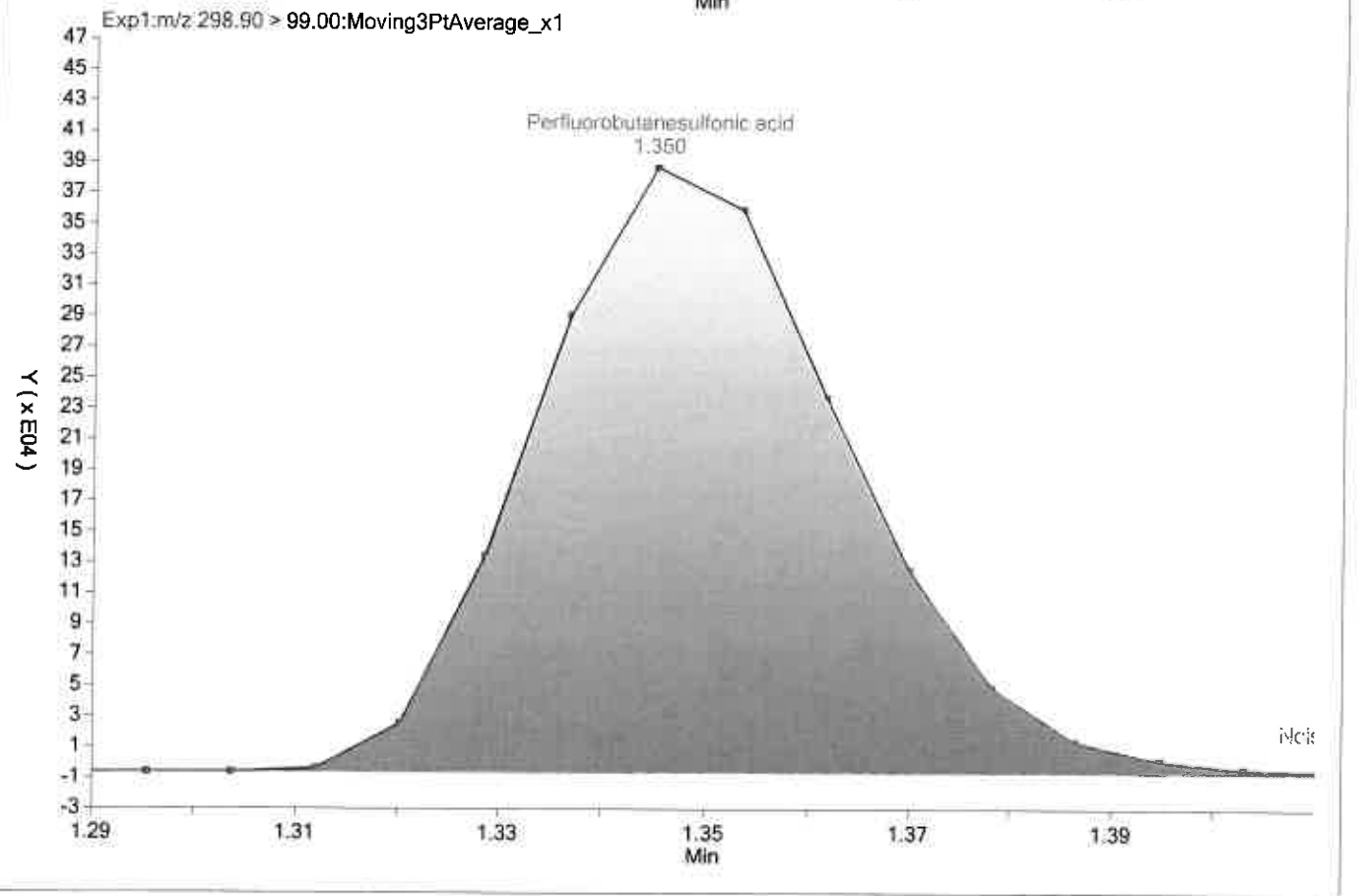
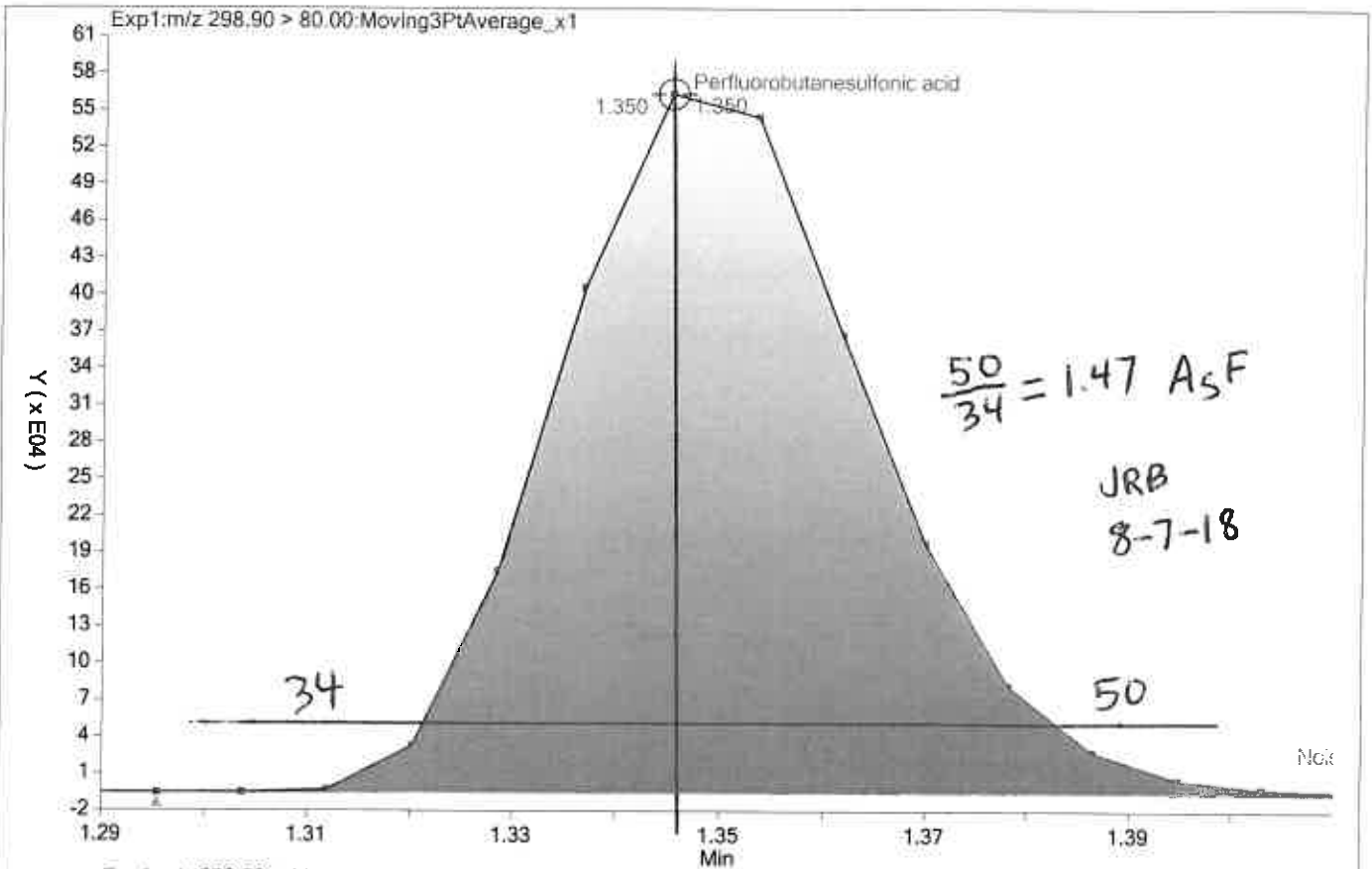
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

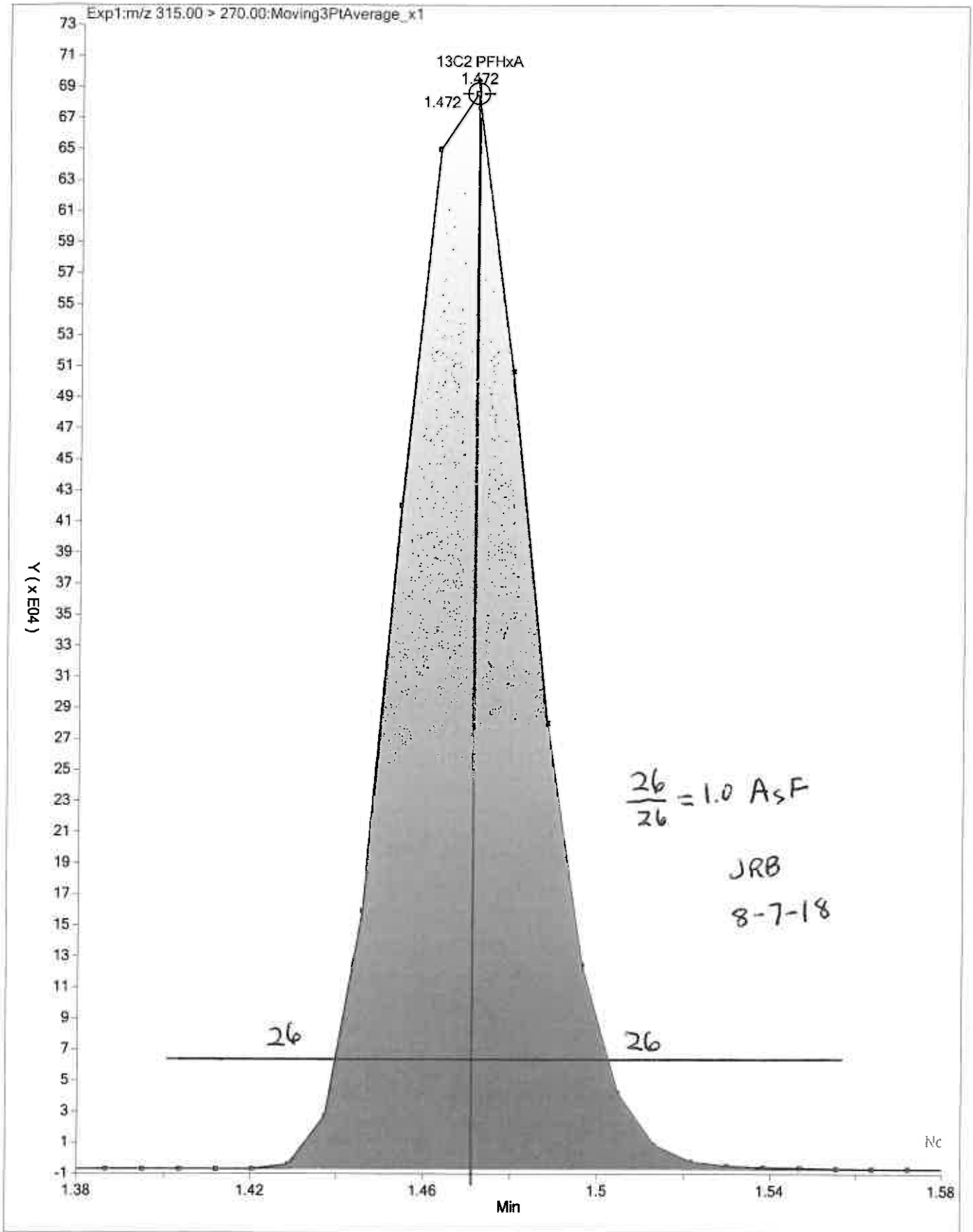
Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238469/2	2018.08.07_537CURVE_003.d
Level 2	IC 320-238469/3	2018.08.07_537CURVE_004.d
Level 3	IC 320-238469/4	2018.08.07_537CURVE_005.d
Level 4	IC 320-238469/5	2018.08.07_537CURVE_006.d
Level 5	IC 320-238469/6	2018.08.07_537CURVE_007.d
Level 6	IC 320-238469/7	2018.08.07_537CURVE_008.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)	7.1	2.7	8.3	1.7	-5.6	-14.3	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	-2.5	-3.3	0.2	3.8	1.1	0.8	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	++++	-1.5	1.9	1.4	-1.3	-0.5		50	30	30	30	30
Perfluorooctanoic acid (PFOA)	6.9	-4.6	-1.4	1.7	-1.1	-1.5	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-2.8	-4.1	1.3	0.4	3.6	1.7	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	0.9	-3.2	-1.3	4.1	0.1	-0.7	50	30	30	30	30	30
13C2 PFHxA	2.0	-2.8	-2.4	1.3	0.1	1.9	30	30	30	30	30	30
13C2 PFDA	-0.5	2.0	-6.3	4.0	-0.2	1.0	30	30	30	30	30	30





TestAmerica Laboratories
Istd/Surrogate Recovery Report

Worklist Name: 07AUG2018_537_ICAL Worklist Num: 62276
 Instrument: A8_N Method: 537_A8_N
 Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b
 Limit Group: LC 537 ICAL
 Analysis Type: SemiVOA
 Inj Volume: 2.00 Inj Vol Units: ul

Lims Batch: 238469
 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			1167019 1.78	2601656 2.01
# 1 RB	07-Aug-2018 12:39:24			1233209 105.7 1.78	2632254 101.2 2.02
	IS Std				
# 2 IC L1	07-Aug-2018 12:44:03	102.00 1.47	99.52 2.22	1196979> 100.0* 1.78	2748260> 100.0* 2.02
# 3 IC L2	07-Aug-2018 12:48:44	96.68 1.46	100.70 2.22	1204534> 100.6* 1.78	2739996> 99.7* 2.02
# 4 IC L3	07-Aug-2018 12:53:24	97.57 1.46	93.69 2.22	1167019> 97.5* 1.78	2601656> 94.7* 2.01
# 5 IC L4	07-Aug-2018 12:58:05	101.30 1.47	103.90 2.22	1063858> 88.9* 1.78	2433237> 88.5* 2.02
# 6 IC L5	07-Aug-2018 13:02:45	100.50 1.47	100.00 2.22	1182103> 98.8* 1.78	2594163> 94.4* 2.02
# 7 IC L6	07-Aug-2018 13:07:25	101.90 1.46	101.00 2.22	1182381> 98.8* 1.77	2586897> 94.1* 2.01

13C2-PFOA

$$RPD = \frac{1204534 - 1063858}{\frac{1204534 + 1063858}{2}} \times 100 = 12.4$$

13C4-PFOS

$$RPD = \frac{2748260 - 2433237}{\frac{2748260 + 2433237}{2}} \times 100 = 12.2$$

JRB
8-7-18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_003.d
 Lims ID: IC L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 07-Aug-2018 12:44:03 ALS Bottle#: 1 Worklist Smp#: 2
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L1_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Aug-2018 13:58:29 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 07-Aug-2018 13:11:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.352	-0.002	1.000	1093854	9.64		1874	
298.90 > 99.00	1.350	1.352	-0.002	1.000	747872		1.46(0.00-0.00)	1304	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.472	1.468	0.004	1.000	1342383	10.2		10671	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.603	-0.002	1.000	500314	2.93		500	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.608	1.605	0.003	1.000	643116	5.00		166	
* 6 13C2-PFOA									
415.00 > 370.00	1.775	1.774	0.001		1196979	10.0		7793	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.775	1.775	0.0	1.000	277484	2.12		37.2	
413.00 > 169.00	1.775	1.775	0.0	1.000	141293		1.96(0.00-0.00)	340	
* 7 13C4 PFOS									
503.00 > 80.00	2.018	2.016	0.002		2748260	28.7		3570	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.018	2.018	0.0	1.000	401757	3.84		501	
499.00 > 99.00	2.018	2.018	0.0	1.000	92241		4.36(0.00-0.00)	257	
9 Perfluorononanoic acid									
463.00 > 419.00	2.026	2.024	0.002	1.000	188460	2.00		33.7	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.220	0.003	1.000	975454	9.95		7598	

Reagents:

LC537-L1_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_003.d

Injection Date: 07-Aug-2018 12:44:03

Instrument ID: A8_N

Lims ID: IC L1

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 1

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

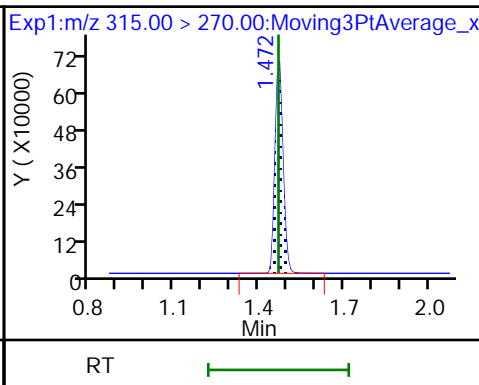
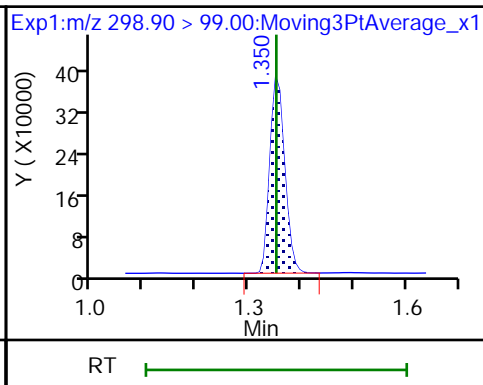
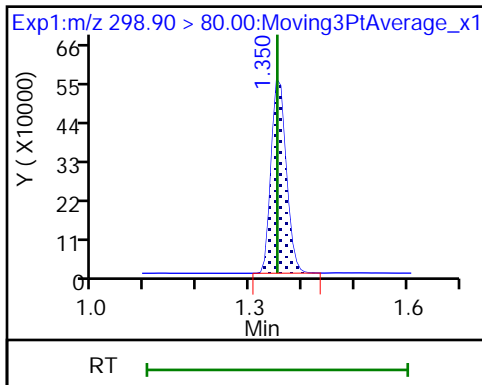
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

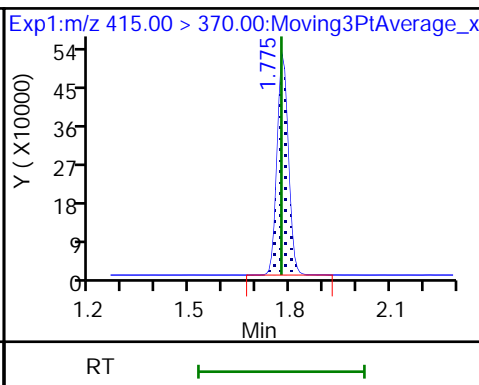
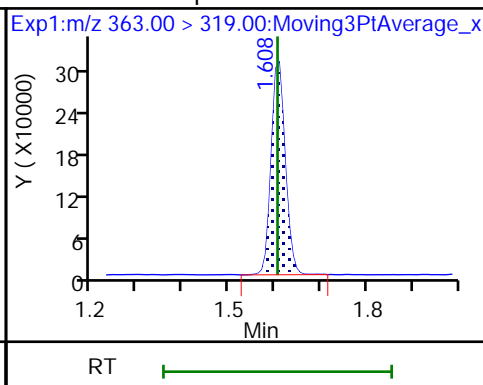
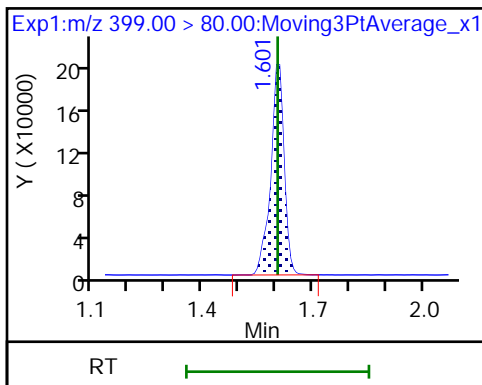
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

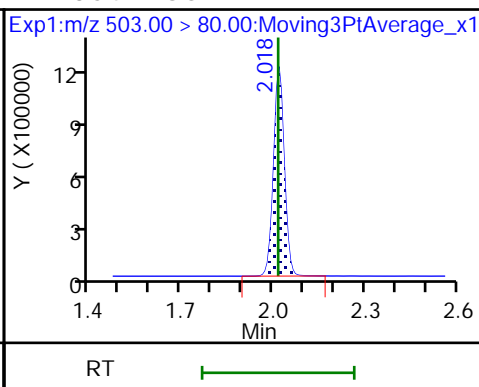
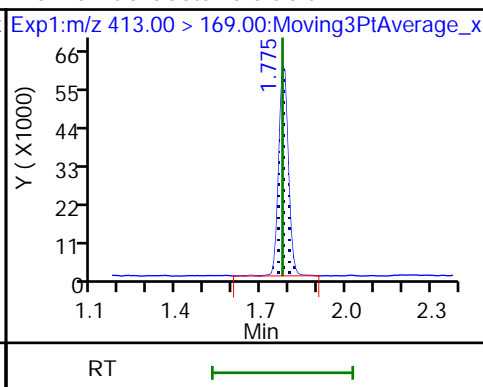
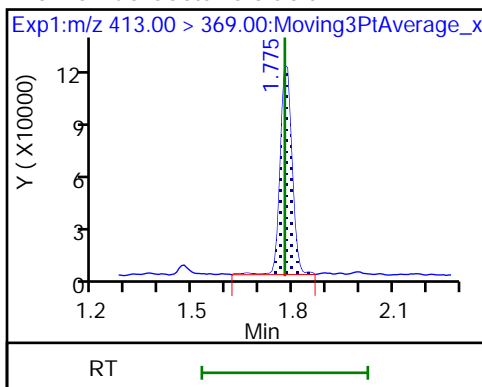
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

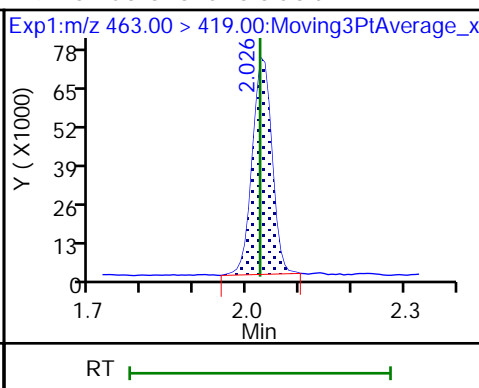
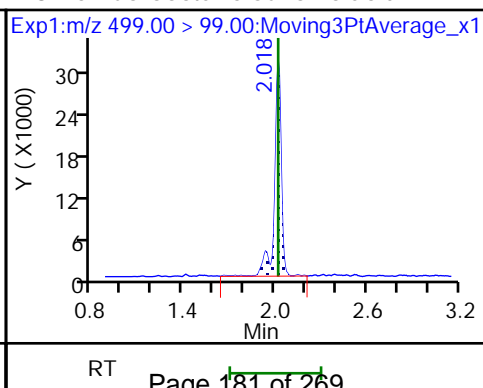
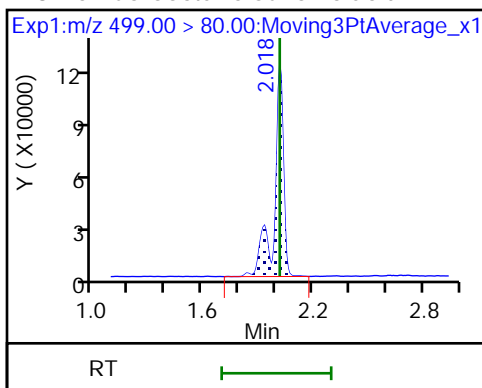
* 7 13C4 PFOS



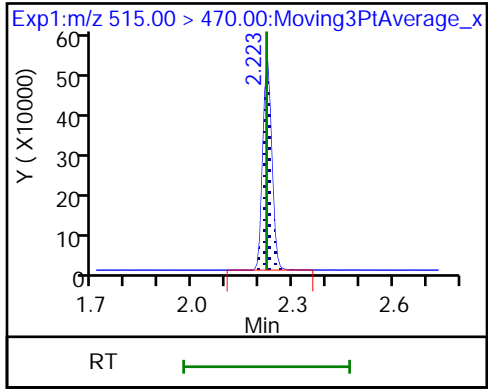
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_004.d
 Lims ID: IC L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 07-Aug-2018 12:48:44 ALS Bottle#: 2 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L2_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Aug-2018 13:58:31 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 07-Aug-2018 13:13:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.352	-0.002	1.000	2326382	20.6		3540	
298.90 > 99.00	1.350	1.352	-0.002	1.000	1596933		1.46(0.00-0.00)	2870	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.468	-0.004	1.000	1286815	9.72		9413	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.603	-0.002	1.000	1107645	6.50		1118	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.605	-0.004	1.000	275735	2.13		72.1	
* 6 13C2-PFOA									
415.00 > 370.00	1.775	1.774	0.001		1204534	10.0		7242	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.775	1.775	0.0	1.000	554036	4.20		75.8	
413.00 > 169.00	1.775	1.775	0.0	1.000	298803		1.85(0.00-0.00)	720	
* 7 13C4 PFOS									
503.00 > 80.00	2.018	2.016	0.002		2739996	28.7		3797	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.018	2.018	0.0	1.000	878368	8.42		1011	
499.00 > 99.00	2.018	2.018	0.0	1.000	188938		4.65(0.00-0.00)	520	
9 Perfluorononanoic acid									
463.00 > 419.00	2.026	2.024	0.002	1.000	404484	4.26		71.8	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.220	0.003	1.000	1005796	10.2		6997	

Reagents:

LC537-L2_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_004.d

Injection Date: 07-Aug-2018 12:48:44

Instrument ID: A8_N

Lims ID: IC L2

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 2

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

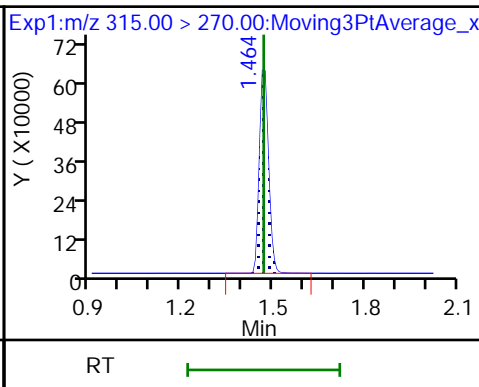
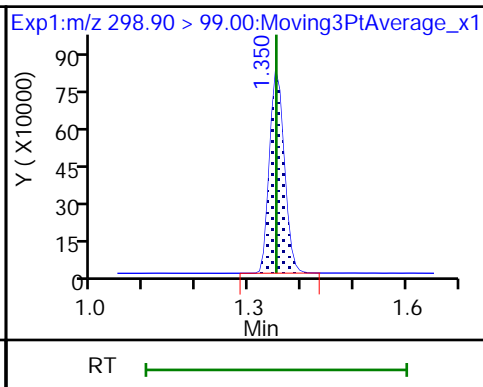
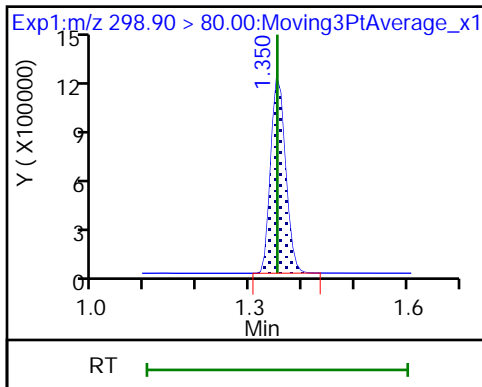
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

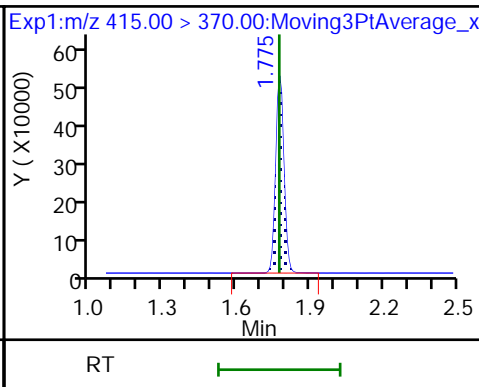
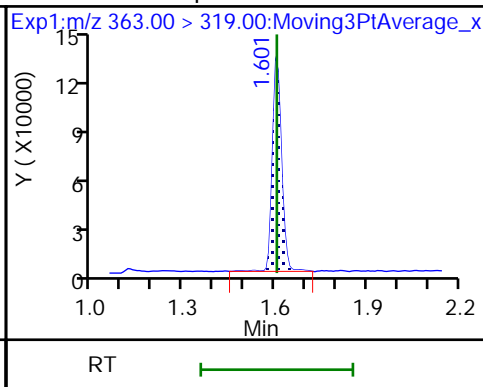
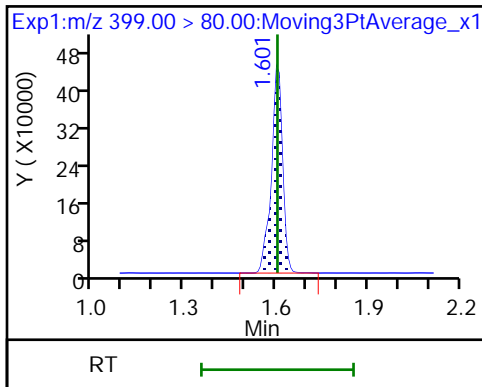
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

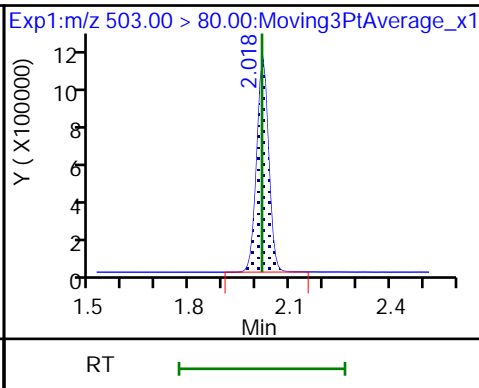
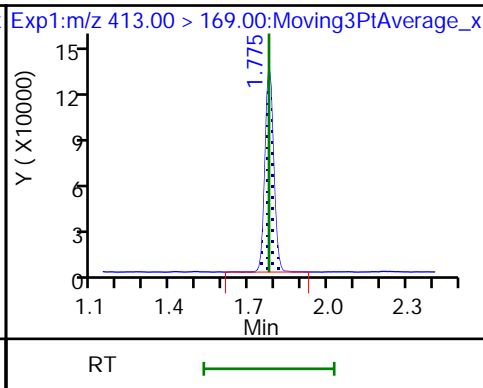
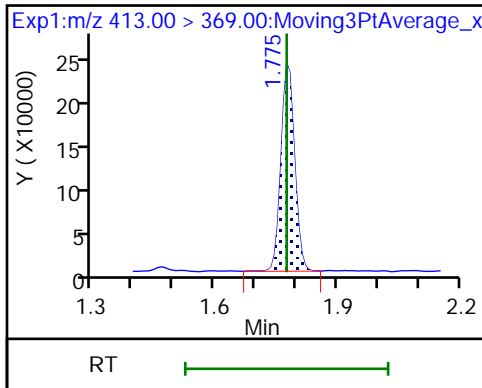
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

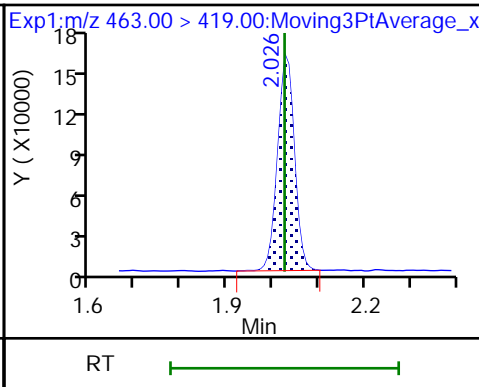
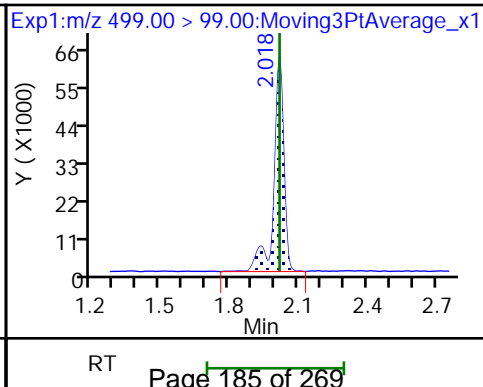
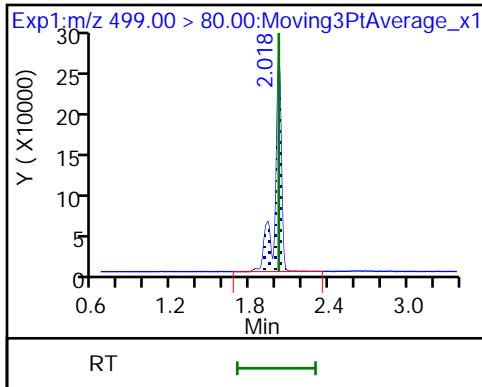
* 7 13C4 PFOS



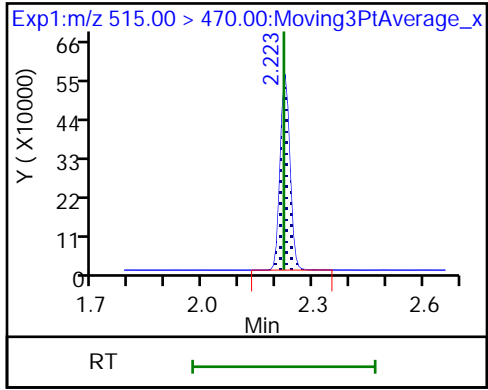
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_005.d
 Lims ID: IC L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 07-Aug-2018 12:53:24 ALS Bottle#: 3 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L3_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Aug-2018 13:58:32 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 07-Aug-2018 13:13:00

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.352	-0.002	1.000	5241287	48.8		7363	
298.90 > 99.00	1.350	1.352	-0.002	1.000	3626614		1.45(0.00-0.00)	5038	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.468	-0.004	1.000	1252048	9.76		11712	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.603	-0.002	1.000	2450188	15.1		2294	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.605	-0.004	1.000	621773	4.95		160	
* 6 13C2-PFOA									
415.00 > 370.00	1.775	1.774	0.001		1167019	10.0		7418	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.775	1.775	0.0	1.000	1247621	9.76		174	
413.00 > 169.00	1.775	1.775	0.0	1.000	660433		1.89(0.00-0.00)	1542	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.016	-0.005		2601656	28.7		3778	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.018	2.018	0.0	1.000	1982811	20.0		2060	
499.00 > 99.00	2.018	2.018	0.0	1.000	423366		4.68(0.00-0.00)	1173	
9 Perfluorononanoic acid									
463.00 > 419.00	2.026	2.024	0.002	1.000	898787	9.77		159	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.220	-0.005	1.000	895349	9.37		6051	

Reagents:

LC537-L3_00025

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_005.d

Injection Date: 07-Aug-2018 12:53:24

Instrument ID: A8_N

Lims ID: IC L3

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 3

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

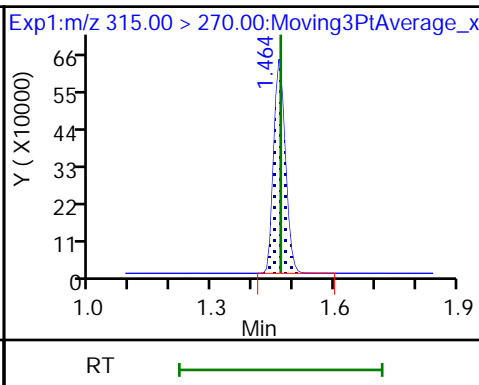
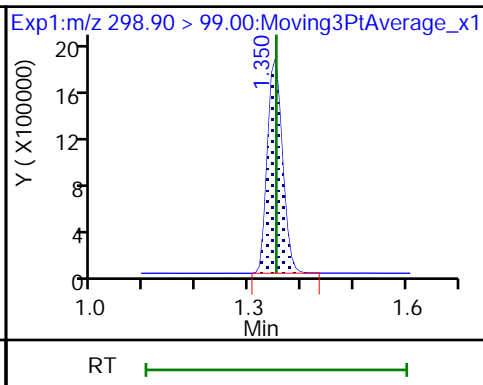
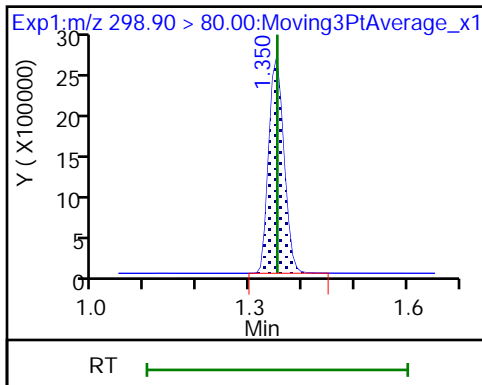
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

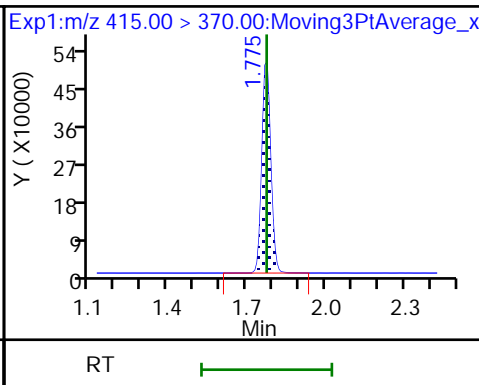
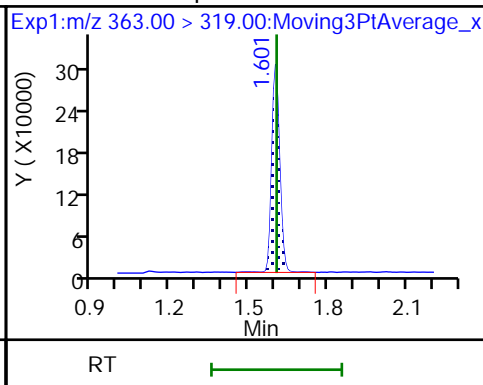
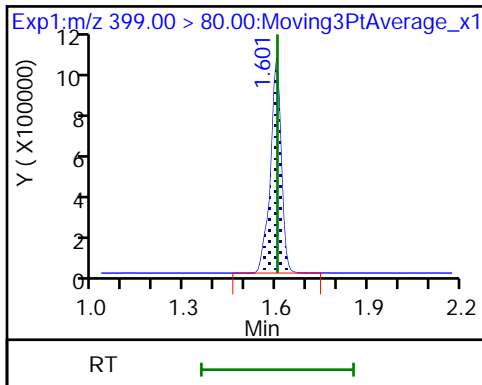
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

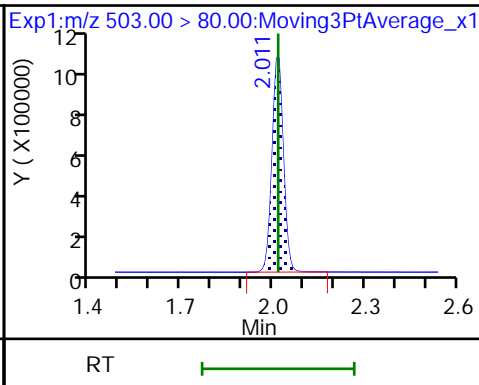
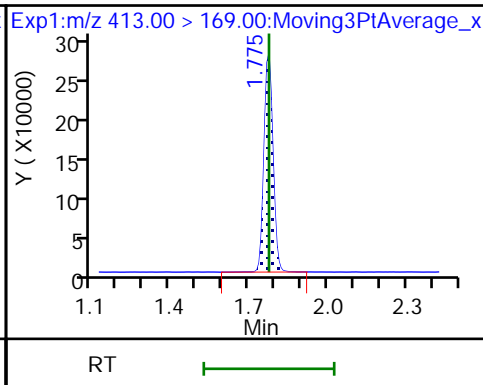
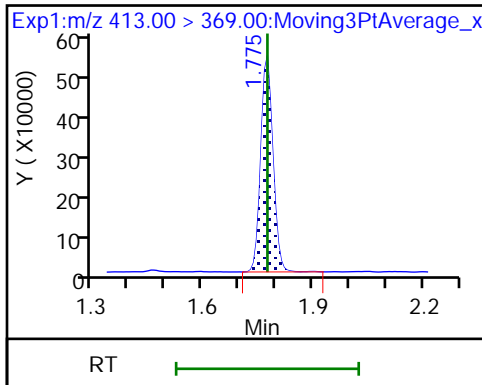
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

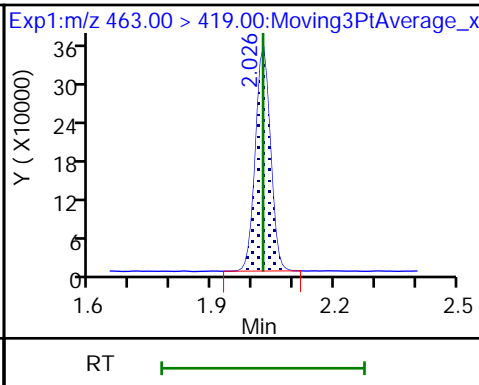
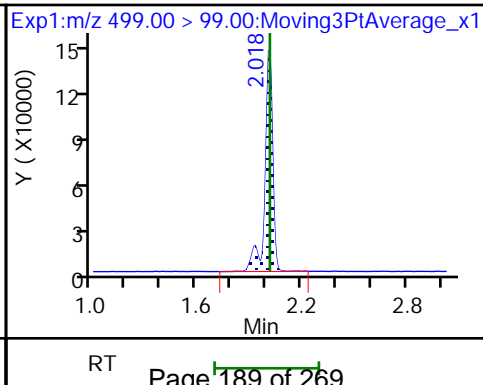
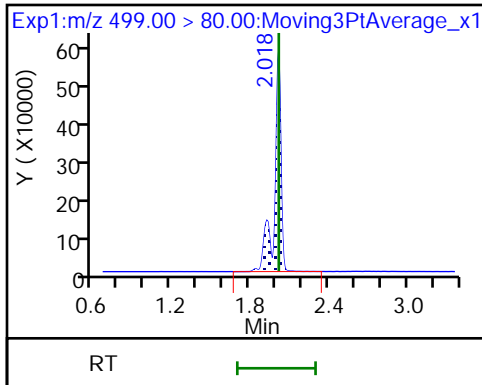
* 7 13C4 PFOS



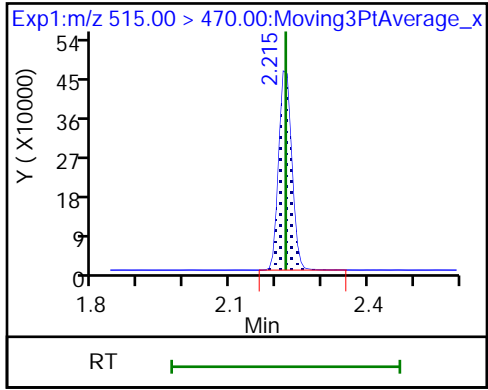
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_006.d
 Lims ID: IC L4
 Client ID:
 Sample Type: ICISAV Calib Level: 4
 Inject. Date: 07-Aug-2018 12:58:05 ALS Bottle#: 4 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L4_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Aug-2018 13:58:33 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 07-Aug-2018 13:12:46

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.352	-0.002	1.000	9203217	91.6		11252	
298.90 > 99.00	1.350	1.352	-0.002	1.000	6828220		1.35(0.00-0.00)	9534	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.472	1.468	0.004	1.000	1184544	10.1		8412	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.608	1.603	0.005	1.000	4747515	31.4		3878	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.608	1.605	0.003	1.000	1128009	9.86		285	
* 6 13C2-PFOA									
415.00 > 370.00	1.775	1.774	0.001		1063858	10.0		6639	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.775	1.775	0.0	1.000	2347790	20.1		325	
413.00 > 169.00	1.775	1.775	0.0	1.000	1230011		1.91(0.00-0.00)	2805	
* 7 13C4 PFOS									
503.00 > 80.00	2.018	2.016	0.002		2433237	28.7		3365	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.018	2.018	0.0	1.000	3674504	39.7		3538	
499.00 > 99.00	2.018	2.018	0.0	1.000	775982		4.74(0.00-0.00)	1971	
9 Perfluorononanoic acid									
463.00 > 419.00	2.026	2.024	0.002	1.000	1728770	20.6		300	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.220	0.003	1.000	905914	10.4		6669	

Reagents:

LC537-L4_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_006.d

Injection Date: 07-Aug-2018 12:58:05

Instrument ID: A8_N

Lims ID: IC L4

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 4

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

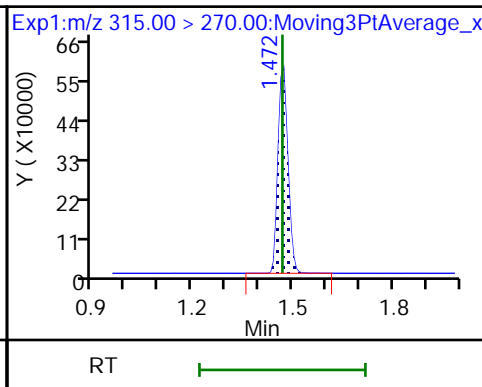
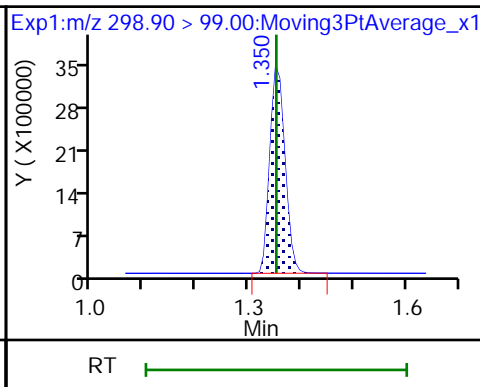
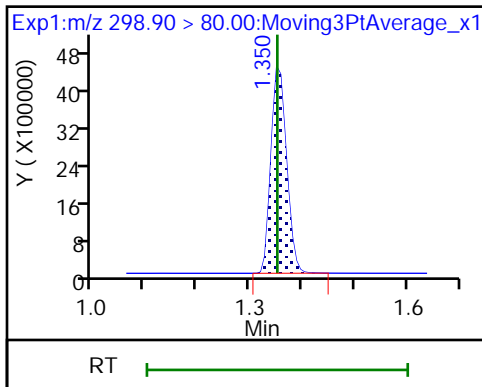
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

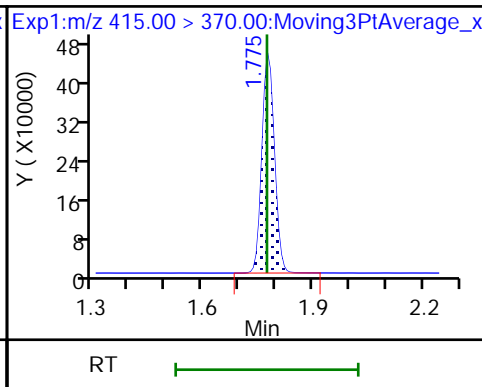
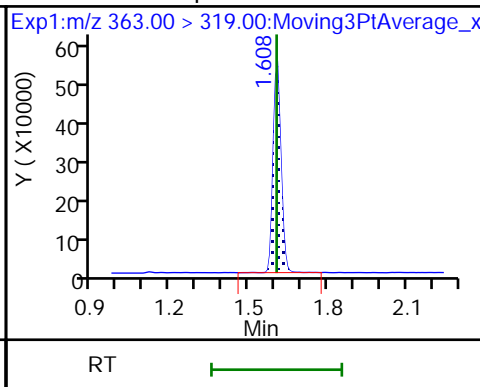
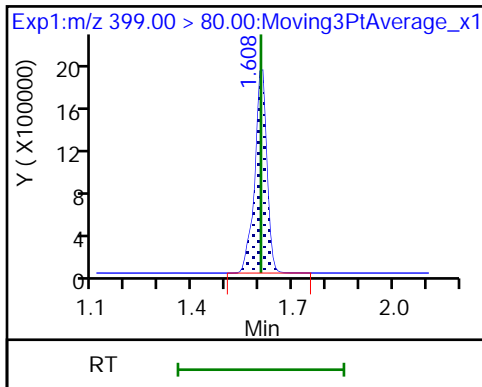
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

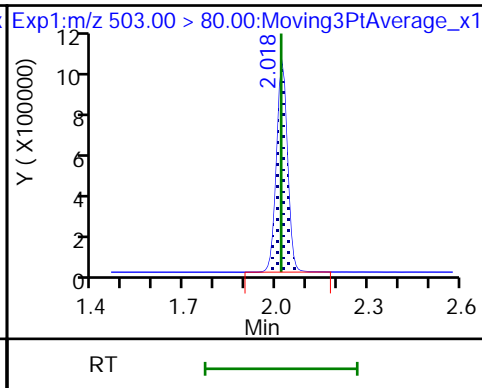
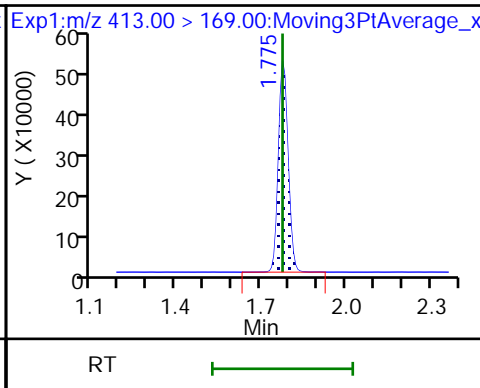
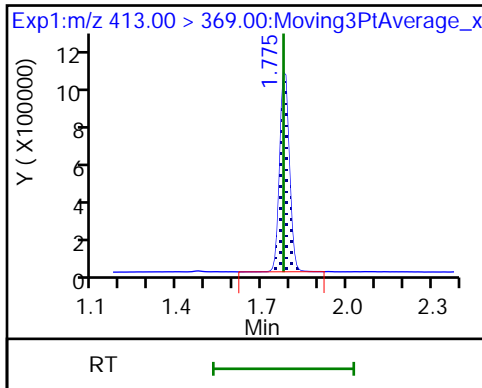
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

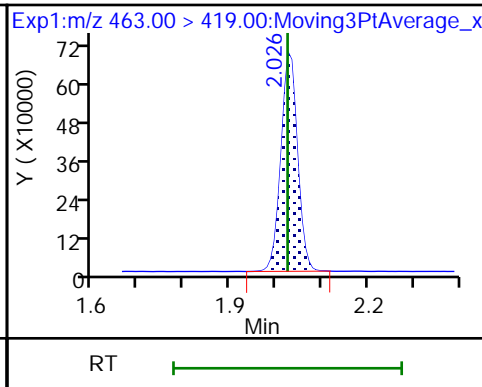
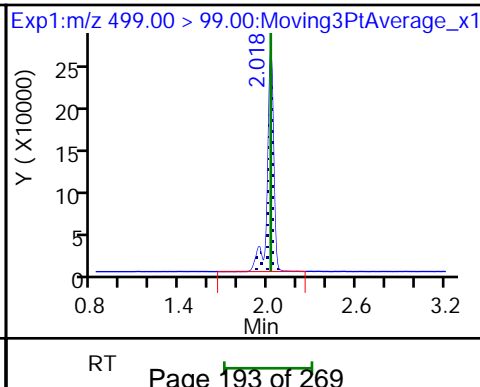
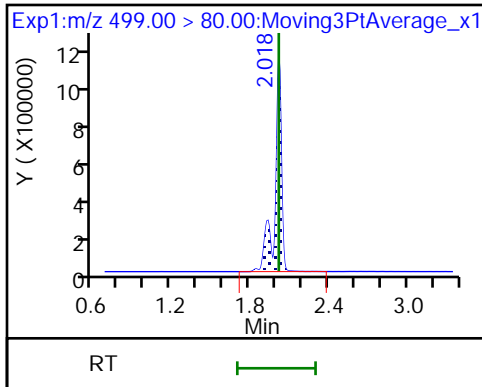
* 7 13C4 PFOS



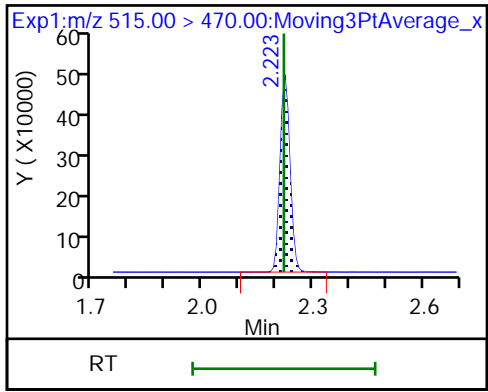
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_007.d
 Lims ID: IC L5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 07-Aug-2018 13:02:45 ALS Bottle#: 5 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L5_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Aug-2018 13:58:34 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 07-Aug-2018 13:12:31

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.358	1.352	0.006	1.000	13659010	127.5		13401	
298.90 > 99.00	1.350	1.352	-0.002	0.994	9948848		1.37(0.00-0.00)	11116	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.472	1.468	0.004	1.000	1301097	10.0		10713	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.608	1.603	0.005	1.000	7395512	45.9		5855	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.608	1.605	0.003	1.000	1828933	14.4		441	
* 6 13C2-PFOA									
415.00 > 370.00	1.775	1.774	0.001		1182103	10.0		7154	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.783	1.775	0.008	1.000	3802739	29.4		515	
413.00 > 169.00	1.775	1.775	0.0	0.996	1988949		1.91(0.00-0.00)	3905	
* 7 13C4 PFOS									
503.00 > 80.00	2.018	2.016	0.002		2594163	28.7		3633	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.018	2.018	0.0	1.000	6063022	61.4		5018	
499.00 > 99.00	2.018	2.018	0.0	1.000	1263173		4.80(0.00-0.00)	2809	
9 Perfluorononanoic acid									
463.00 > 419.00	2.026	2.024	0.002	1.000	2770632	29.7		461	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.220	0.003	1.000	965975	9.98		7819	

Reagents:

LC537-L5_00026

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_007.d

Injection Date: 07-Aug-2018 13:02:45

Instrument ID: A8_N

Lims ID: IC L5

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 5

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

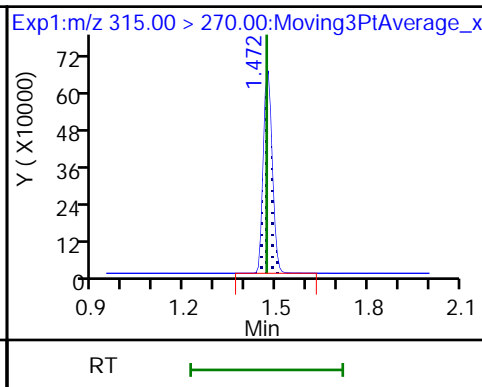
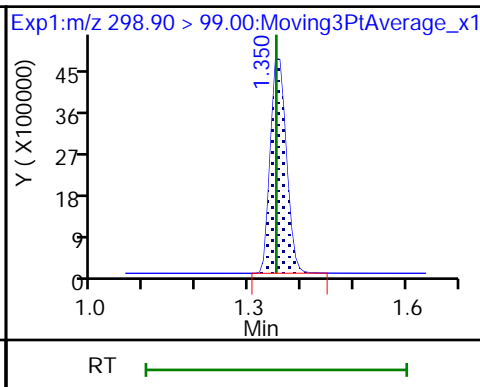
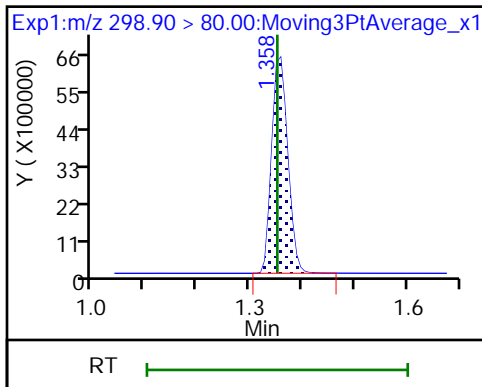
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

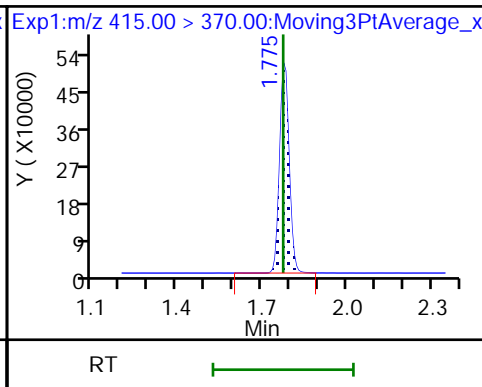
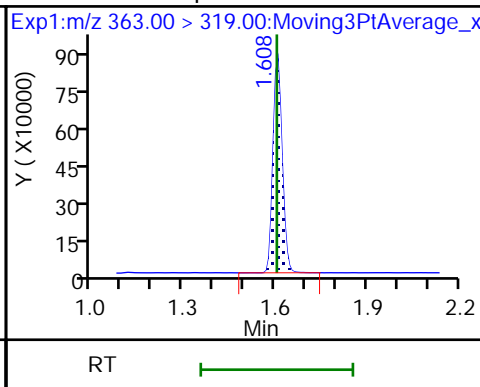
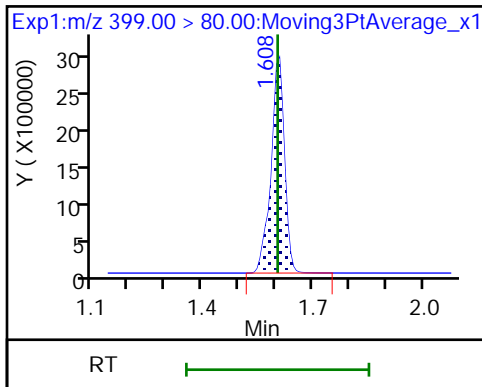
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

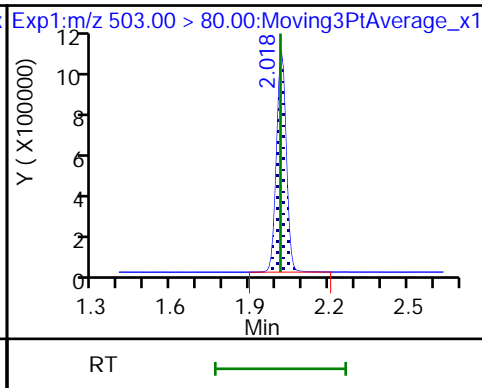
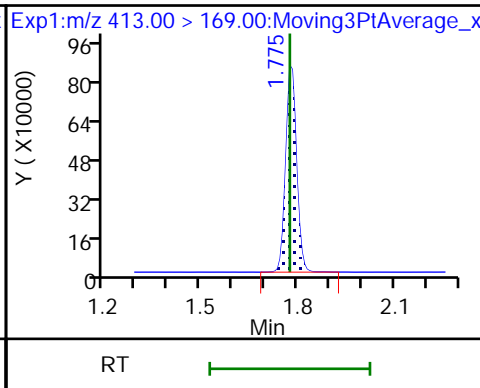
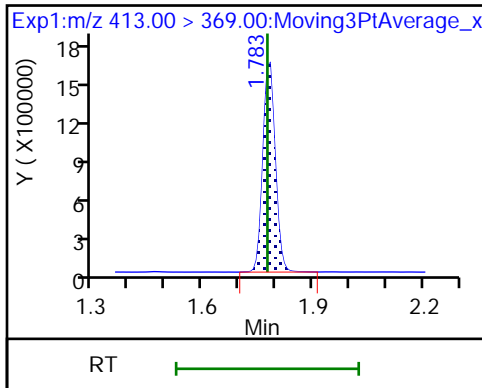
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

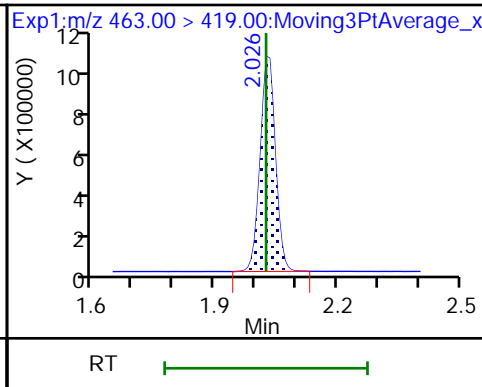
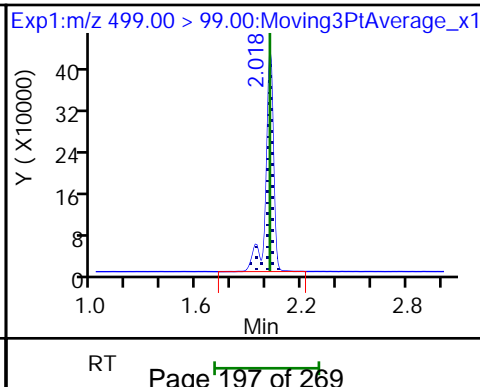
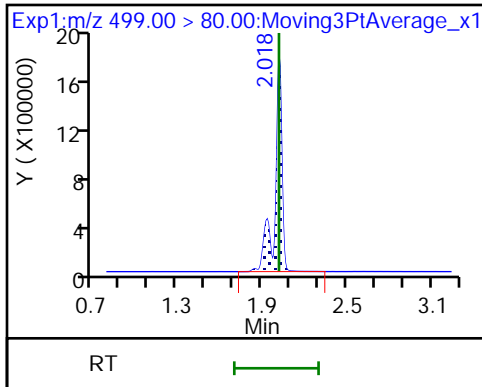
* 7 13C4 PFOS



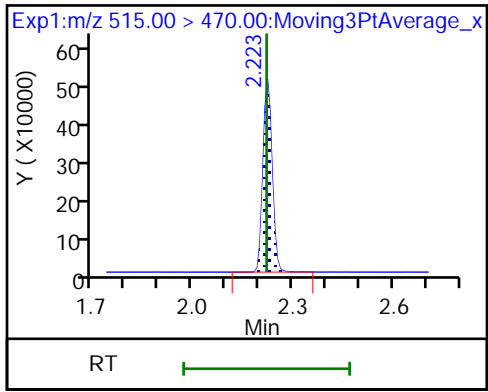
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Lims ID: IC L6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 07-Aug-2018 13:07:25 ALS Bottle#: 6 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L6_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Aug-2018 13:58:35 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 07-Aug-2018 13:17:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.352	-0.002	1.000	16487048	154.4		13956	
298.90 > 99.00	1.350	1.352	-0.002	1.000	12510280		1.32(0.00-0.00)	12516	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.468	-0.004	1.000	1325342	10.2		10456	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.603	-0.002	1.000	9803009	61.0		7313	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.605	-0.004	1.000	2459664	19.3		614	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.774	-0.006		1182381	10.0		7425	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.775	-0.007	1.000	5050799	39.0		695	
413.00 > 169.00	1.768	1.775	-0.007	1.000	2649100		1.91(0.00-0.00)	5173	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.016	-0.005		2586897	28.7		3267	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.011	2.018	-0.007	1.000	7918924	80.4		5918	
499.00 > 99.00	2.011	2.018	-0.007	1.000	1707086		4.64(0.00-0.00)	3518	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.024	-0.006	1.000	3665889	39.3		624	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.220	-0.005	1.000	978205	10.1		7944	

Reagents:

LC537-L6_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Injection Date: 07-Aug-2018 13:07:25

Instrument ID: A8_N

Lims ID: IC L6

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 6

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

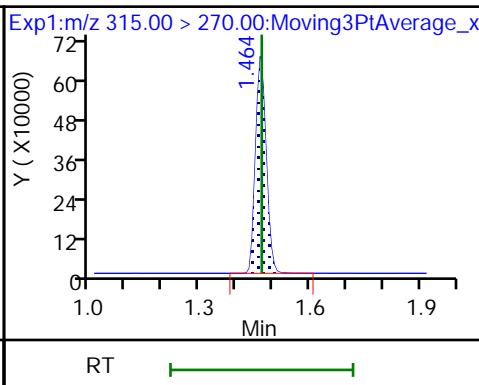
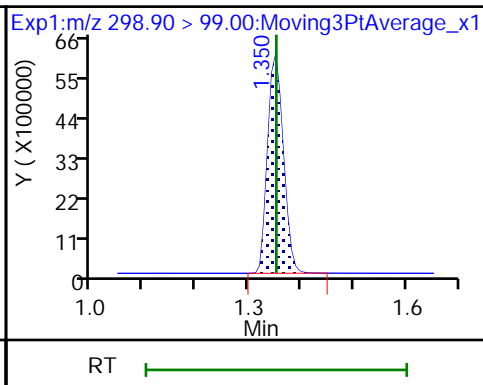
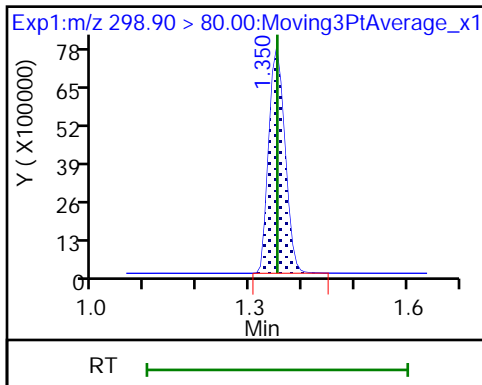
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

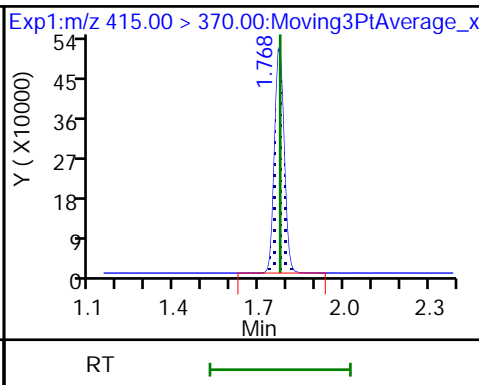
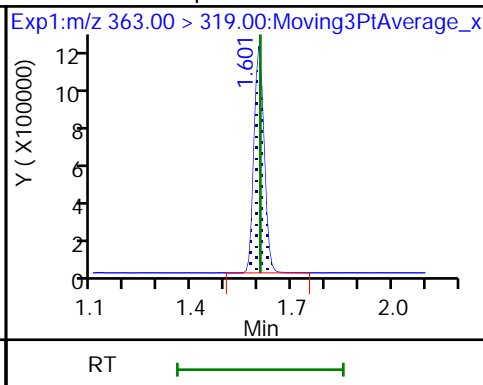
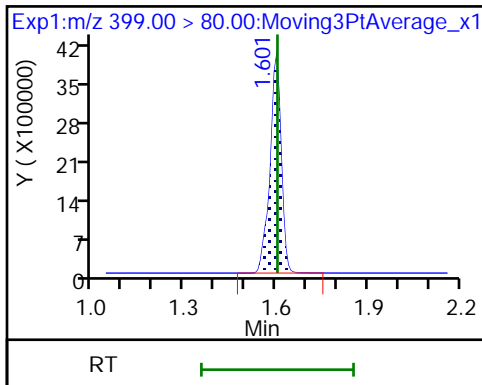
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

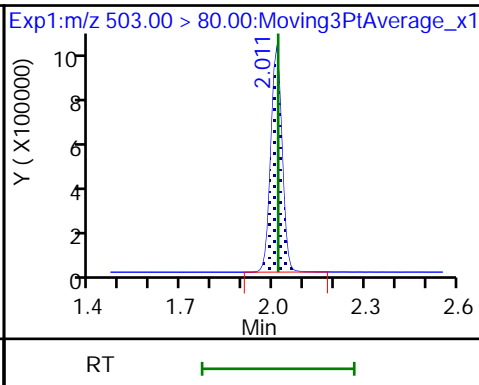
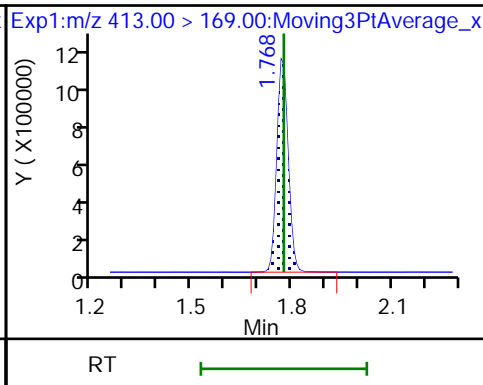
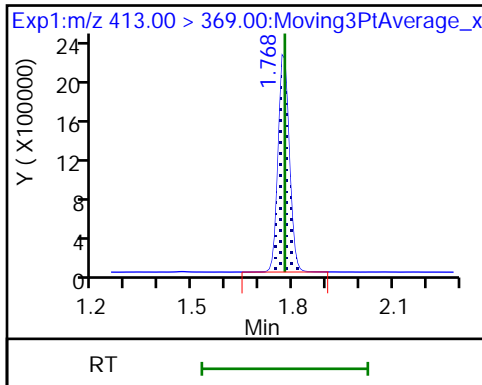
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

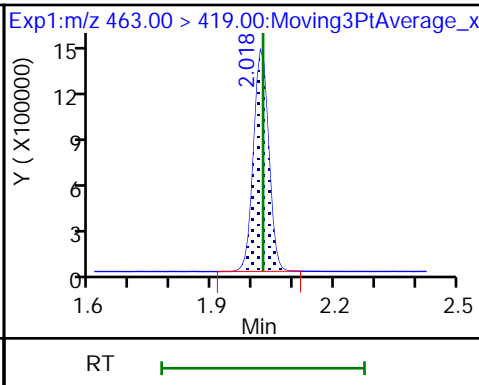
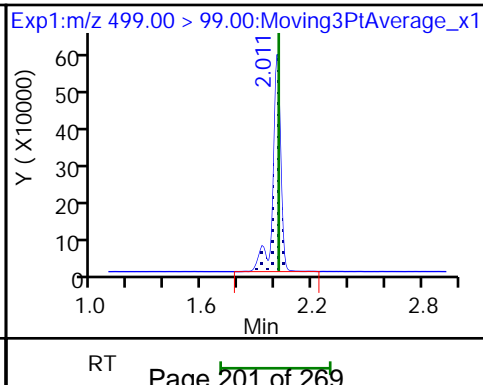
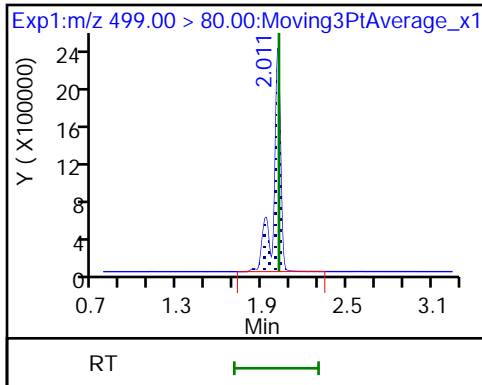
* 7 13C4 PFOS



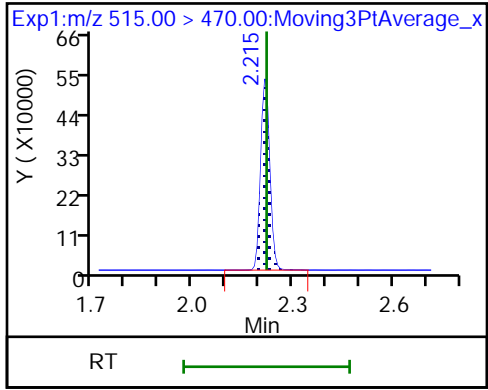
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



Calibration

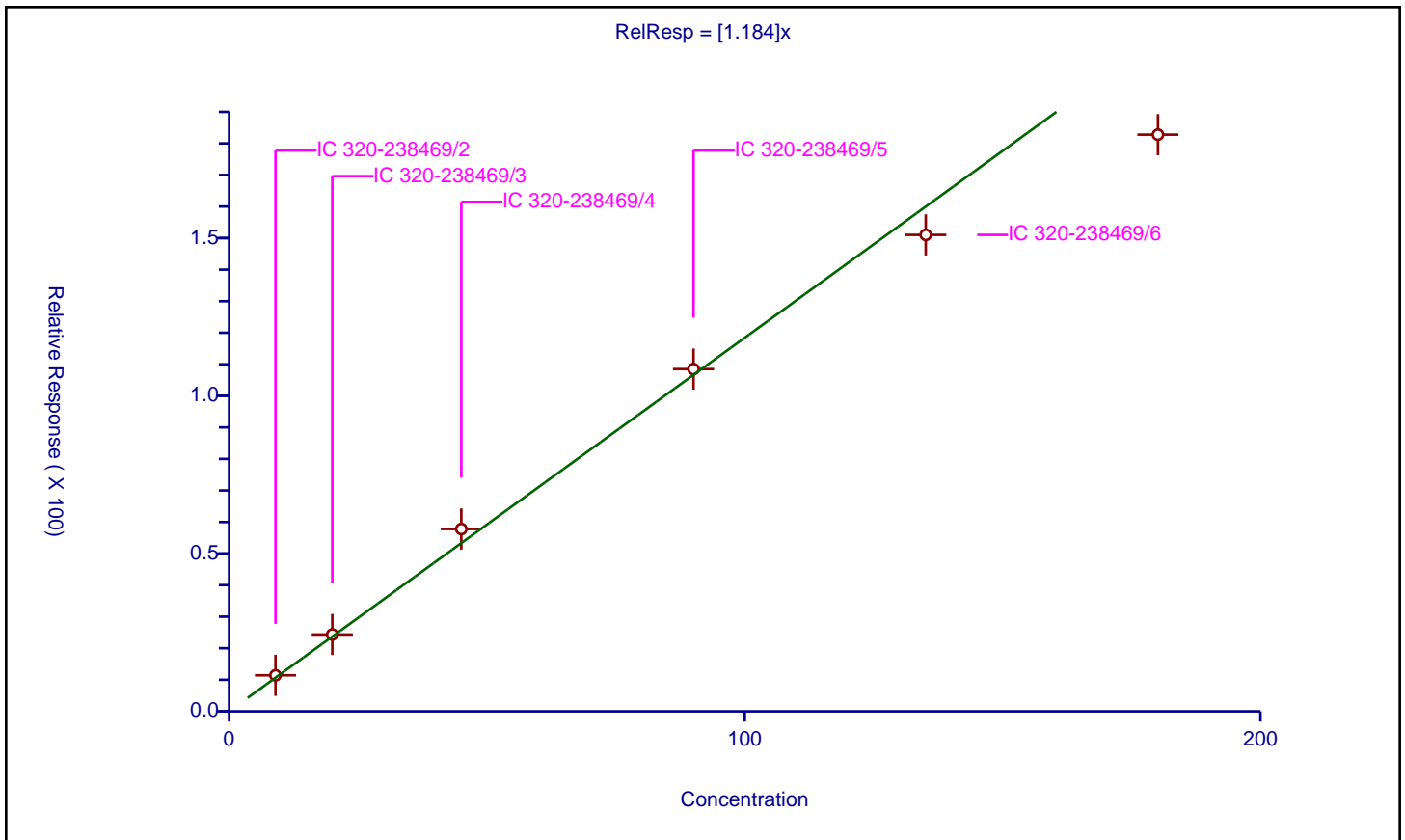
/ Perfluorobutanesulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: ISTD
 Response Base: AREA
 RF Rounding: 0

Curve Coefficients	
Intercept:	0
Slope:	1.184

Error Coefficients	
Standard Error:	10700000
Relative Standard Error:	8.6
Correlation Coefficient:	0.993
Coefficient of Determination (Adjusted):	0.988

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238469/2	8.99912	11.415125	28.68	2748260.0	1.268471	Y
2	IC 320-238469/3	20.01376	24.350633	28.68	2739996.0	1.216695	Y
3	IC 320-238469/4	45.03096	57.778627	28.68	2601656.0	1.283087	Y
4	IC 320-238469/5	90.06192	108.476184	28.68	2433237.0	1.204462	Y
5	IC 320-238469/6	135.09288	151.008401	28.68	2594163.0	1.117812	Y
6	IC 320-238469/7	180.12384	182.785993	28.68	2586897.0	1.01478	Y



Calibration

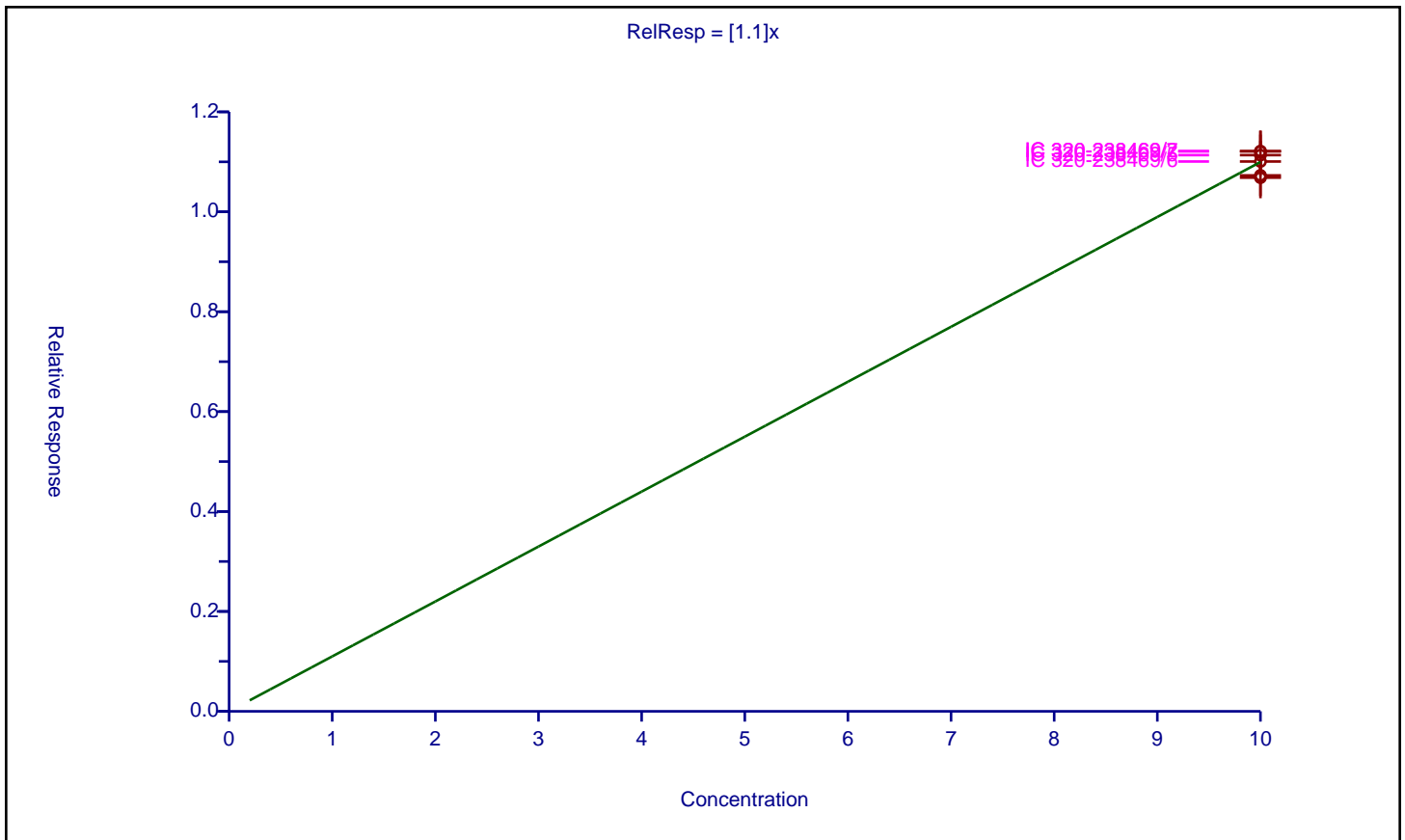
/ 13C2 PFHxA

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: ISTD
Response Base: AREA
RF Rounding: 0

Curve Coefficients	
Intercept:	0
Slope:	1.1

Error Coefficients	
Standard Error:	1410000
Relative Standard Error:	2.2
Correlation Coefficient:	NA
Coefficient of Determination (Adjusted):	0

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238469/2	10.0	11.214758	10.0	1196979.0	1.121476	Y
2	IC 320-238469/3	10.0	10.683094	10.0	1204534.0	1.068309	Y
3	IC 320-238469/4	10.0	10.7286	10.0	1167019.0	1.07286	Y
4	IC 320-238469/5	10.0	11.134418	10.0	1063858.0	1.113442	Y
5	IC 320-238469/6	10.0	11.00663	10.0	1182103.0	1.100663	Y
6	IC 320-238469/7	10.0	11.209094	10.0	1182381.0	1.120909	Y



Calibration

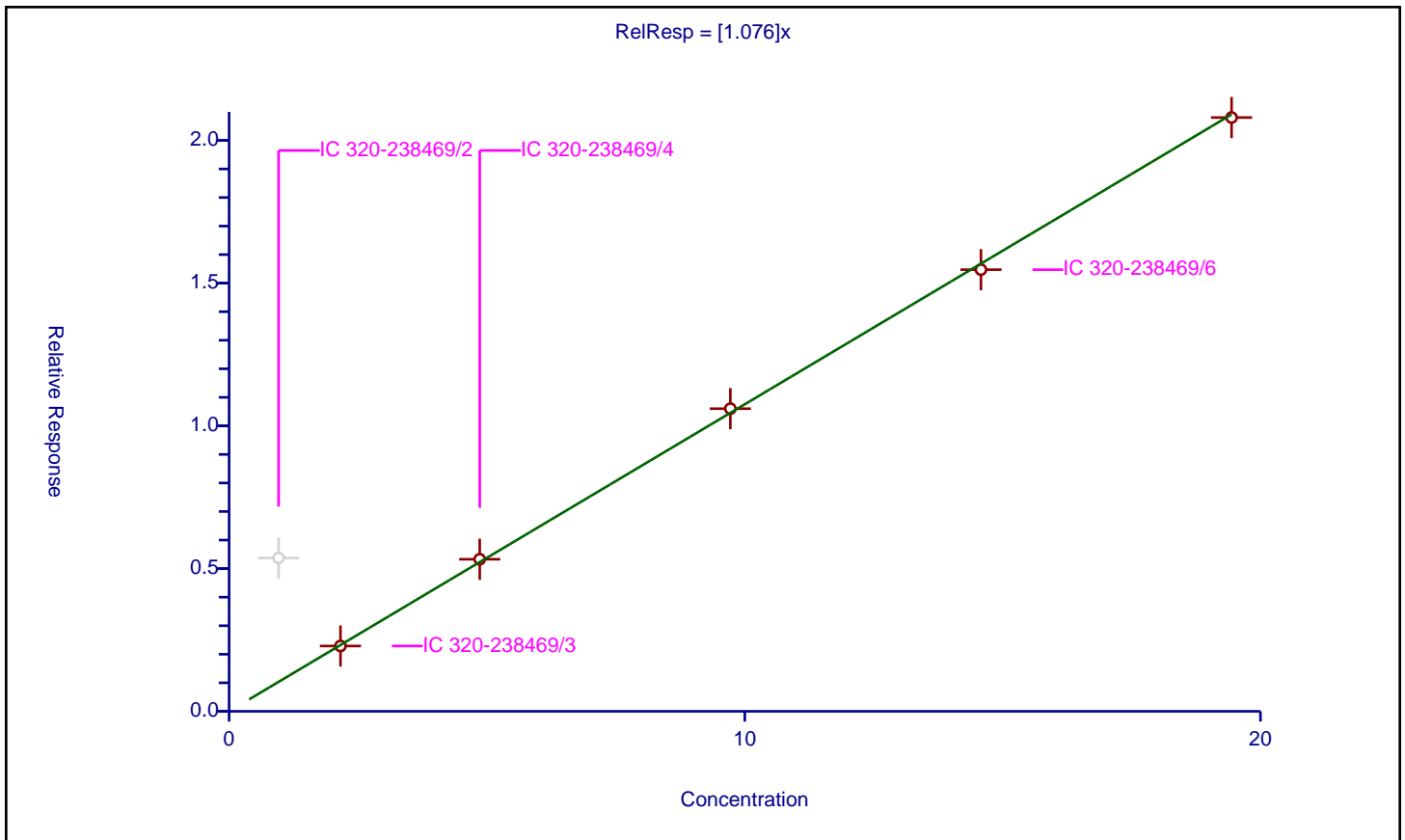
/ Perfluoroheptanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: ISTD
 Response Base: AREA
 RF Rounding: 0

Curve Coefficients	
Intercept:	0
Slope:	1.076

Error Coefficients	
Standard Error:	1670000
Relative Standard Error:	1.6
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238469/2	0.96	5.372826	10.0	1196979.0	5.596694	N
2	IC 320-238469/3	2.16	2.289143	10.0	1204534.0	1.059788	Y
3	IC 320-238469/4	4.86	5.327874	10.0	1167019.0	1.09627	Y
4	IC 320-238469/5	9.72	10.603003	10.0	1063858.0	1.090844	Y
5	IC 320-238469/6	14.58	15.471858	10.0	1182103.0	1.06117	Y
6	IC 320-238469/7	19.44	20.802635	10.0	1182381.0	1.070094	Y



Calibration

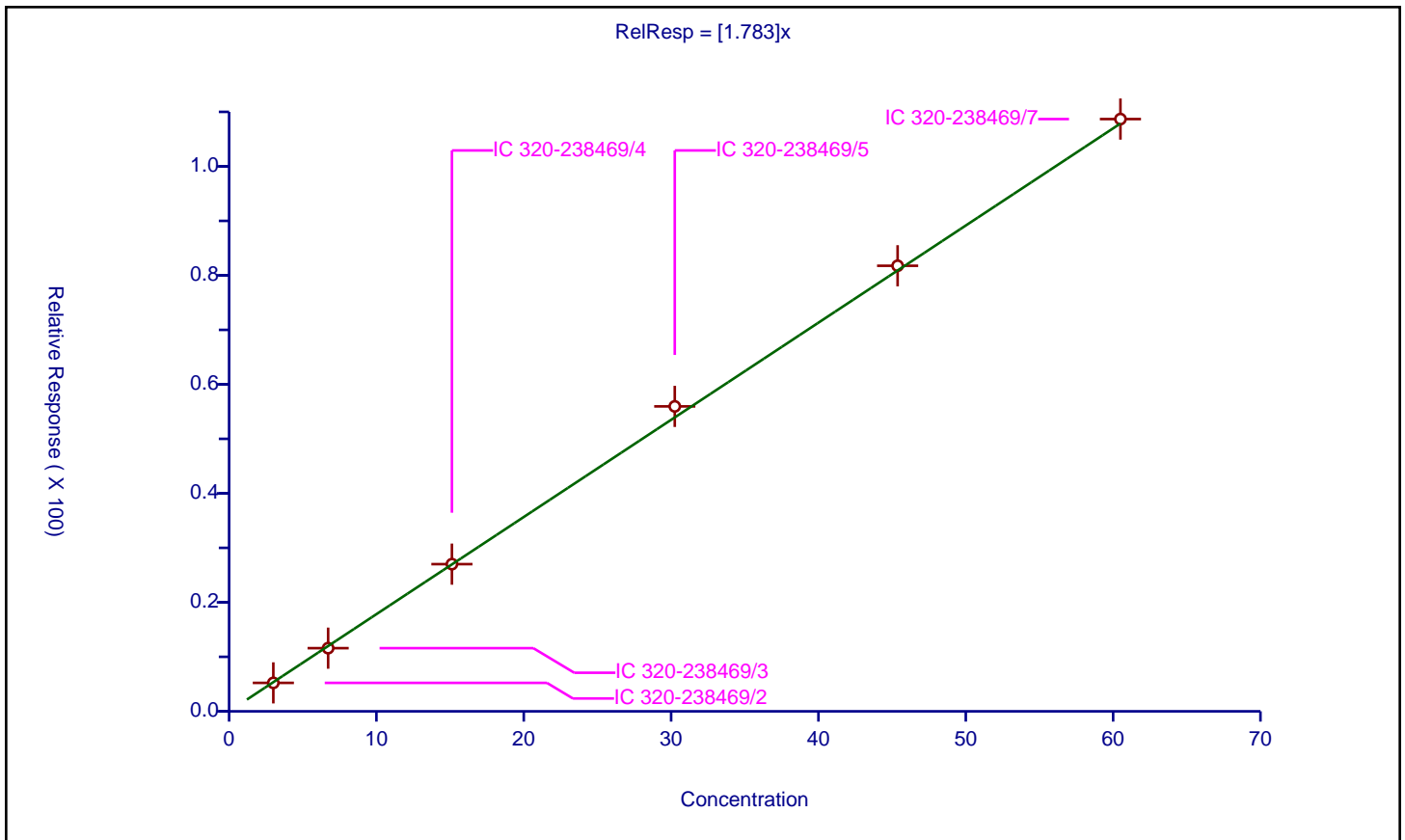
/ Perfluorohexanesulfonic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: ISTD
Response Base: AREA
RF Rounding: 0

Curve Coefficients	
Intercept:	0
Slope:	1.783

Error Coefficients	
Standard Error:	6010000
Relative Standard Error:	2.6
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238469/2	3.003	5.221124	28.68	2748260.0	1.738636	Y
2	IC 320-238469/3	6.721867	11.593907	28.68	2739996.0	1.724805	Y
3	IC 320-238469/4	15.1242	27.010255	28.68	2601656.0	1.785896	Y
4	IC 320-238469/5	30.2484	55.957858	28.68	2433237.0	1.849944	Y
5	IC 320-238469/6	45.3726	81.761741	28.68	2594163.0	1.802007	Y
6	IC 320-238469/7	60.4968	108.682448	28.68	2586897.0	1.796499	Y



Calibration

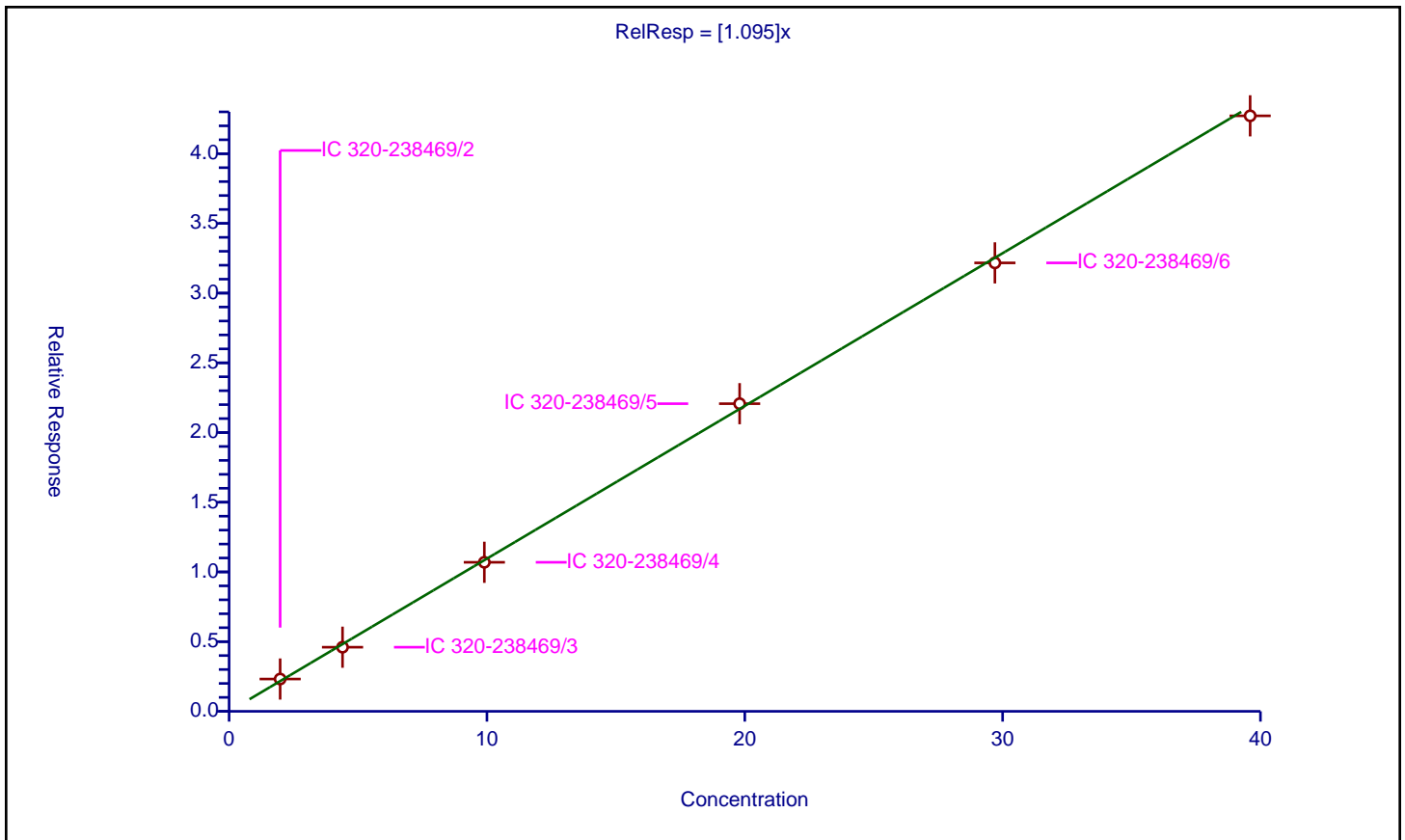
/ Perfluorooctanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: ISTD
 Response Base: AREA
 RF Rounding: 0

Curve Coefficients	
Intercept:	0
Slope:	1.095

Error Coefficients	
Standard Error:	3080000
Relative Standard Error:	3.9
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238469/2	1.98	2.318203	10.0	1196979.0	1.170809	Y
2	IC 320-238469/3	4.4	4.599588	10.0	1204534.0	1.045361	Y
3	IC 320-238469/4	9.9	10.690666	10.0	1167019.0	1.079865	Y
4	IC 320-238469/5	19.8	22.068641	10.0	1063858.0	1.114578	Y
5	IC 320-238469/6	29.7	32.16927	10.0	1182103.0	1.08314	Y
6	IC 320-238469/7	39.6	42.717187	10.0	1182381.0	1.078717	Y



Calibration

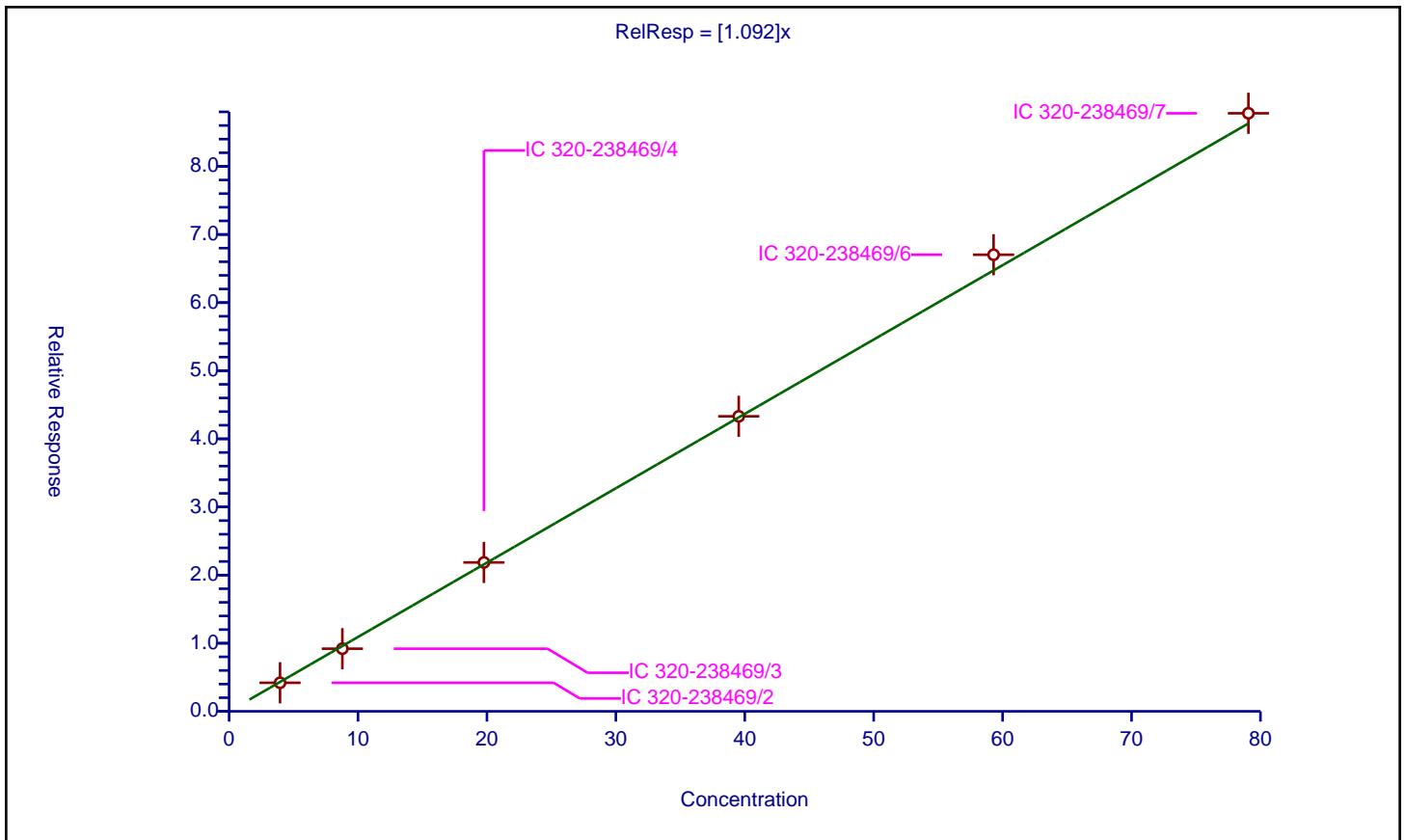
/ Perfluorooctane sulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: ISTD
 Response Base: AREA
 RF Rounding: 0

Curve Coefficients	
Intercept:	0
Slope:	1.092

Error Coefficients	
Standard Error:	4850000
Relative Standard Error:	2.9
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238469/2	3.95328	4.192613	28.68	2748260.0	1.06054	Y
2	IC 320-238469/3	8.785067	9.194026	28.68	2739996.0	1.046552	Y
3	IC 320-238469/4	19.7664	21.858009	28.68	2601656.0	1.105816	Y
4	IC 320-238469/5	39.5328	43.310526	28.68	2433237.0	1.095559	Y
5	IC 320-238469/6	59.2992	67.03028	28.68	2594163.0	1.130374	Y
6	IC 320-238469/7	79.0656	87.794273	28.68	2586897.0	1.110398	Y



Calibration

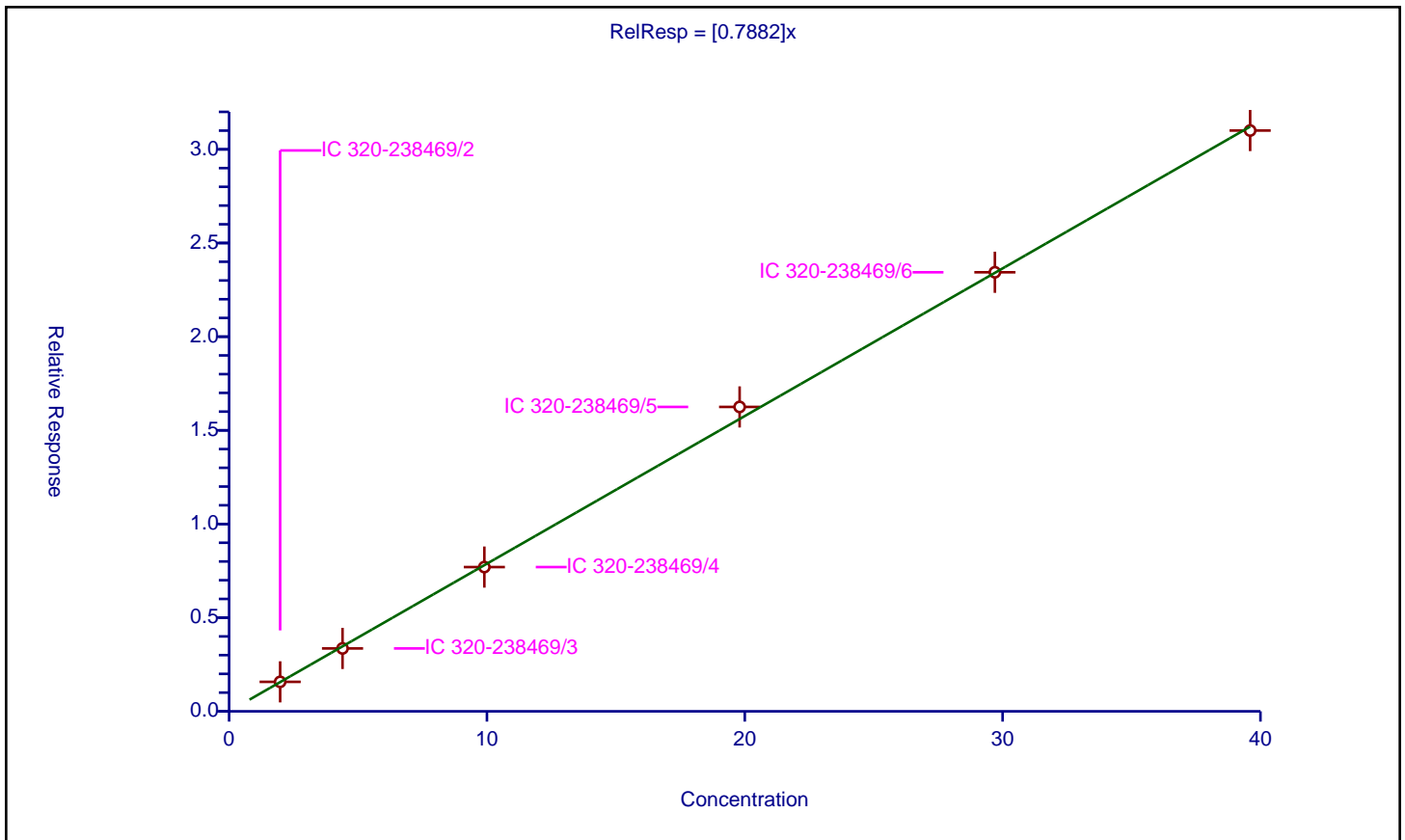
/ Perfluorononanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: ISTD
 Response Base: AREA
 RF Rounding: 0

Curve Coefficients	
Intercept:	0
Slope:	0.7882

Error Coefficients	
Standard Error:	2240000
Relative Standard Error:	2.5
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238469/2	1.98	1.574464	10.0	1196979.0	0.795184	Y
2	IC 320-238469/3	4.4	3.358012	10.0	1204534.0	0.763185	Y
3	IC 320-238469/4	9.9	7.701563	10.0	1167019.0	0.777936	Y
4	IC 320-238469/5	19.8	16.250007	10.0	1063858.0	0.820707	Y
5	IC 320-238469/6	29.7	23.438161	10.0	1182103.0	0.789164	Y
6	IC 320-238469/7	39.6	31.004296	10.0	1182381.0	0.782937	Y



Calibration

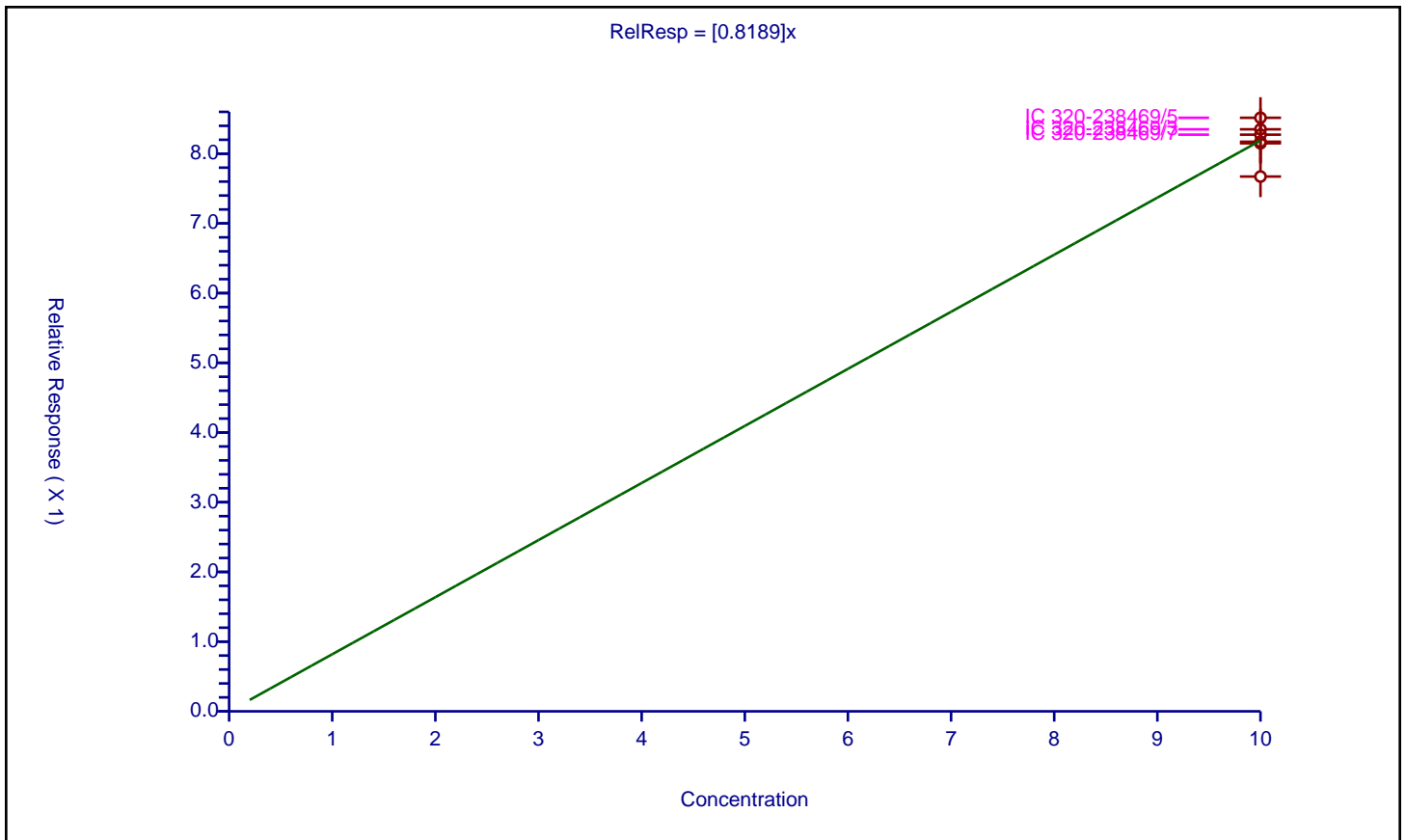
/ 13C2 PFDA

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: ISTD
Response Base: AREA
RF Rounding: 0

Curve Coefficients	
Intercept:	0
Slope:	0.8189

Error Coefficients	
Standard Error:	1050000
Relative Standard Error:	3.5
Correlation Coefficient:	NA
Coefficient of Determination (Adjusted):	0.0000000000000000222

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238469/2	10.0	8.149299	10.0	1196979.0	0.81493	Y
2	IC 320-238469/3	10.0	8.350084	10.0	1204534.0	0.835008	Y
3	IC 320-238469/4	10.0	7.672103	10.0	1167019.0	0.76721	Y
4	IC 320-238469/5	10.0	8.515366	10.0	1063858.0	0.851537	Y
5	IC 320-238469/6	10.0	8.171665	10.0	1182103.0	0.817167	Y
6	IC 320-238469/7	10.0	8.273179	10.0	1182381.0	0.827318	Y



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-238469/9 Calibration Date: 08/07/2018 13:16
 Instrument ID: A8_N Calib Start Date: 08/07/2018 12:44
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07
 Lab File ID: 2018.08.07_537CURVE_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.259		21.3	20.0	6.3	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.049		2.11	2.16	-2.5	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.727		6.51	6.72	-3.2	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.051		4.22	4.40	-4.1	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.042		8.39	8.79	-4.5	50.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7696		4.30	4.40	-2.4	50.0
13C2 PFHxA	Ave	1.100	1.095		9.96	10.0	-0.4	30.0
13C2 PFDA	Ave	0.8189	0.8007		9.78	10.0	-2.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_010.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 07-Aug-2018 13:16:43 ALS Bottle#: 2 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L2
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Aug-2018 13:58:37 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK014

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.352	-0.002	1.000	2332407	21.3		3628	
298.90 > 99.00	1.350	1.352	-0.002	1.000	1574823		1.48(0.00-0.00)	2431	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.468	-0.004	1.000	1266592	9.96		10956	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.603	-0.002	1.000	1074594	6.51		1073	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.605	-0.004	1.000	262029	2.11		64.1	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.774	-0.006		1156656	10.0		7558	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.775	1.775	0.0	1.000	534834	4.22		80.8	
413.00 > 169.00	1.768	1.775	-0.007	0.996	275061		1.94(0.00-0.00)	611	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.016	-0.005		2655389	28.7		3793	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.011	2.018	-0.007	1.000	847924	8.39		857	
499.00 > 99.00	2.011	2.018	-0.007	1.000	190952		4.44(0.00-0.00)	592	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.024	-0.006	1.000	391671	4.30		69.6	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.220	0.003	1.000	926133	9.78		6522	

Reagents:

LC537-L2_00022 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_010.d

Injection Date: 07-Aug-2018 13:16:43

Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 2

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

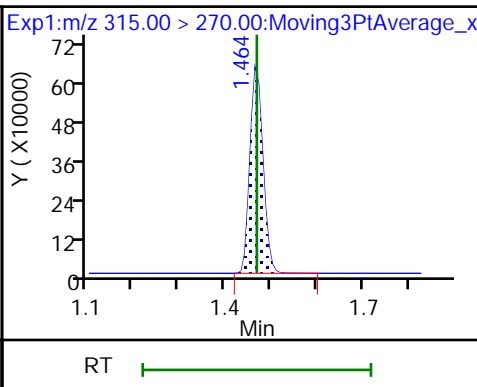
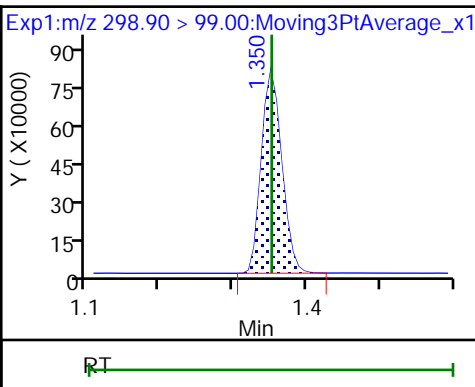
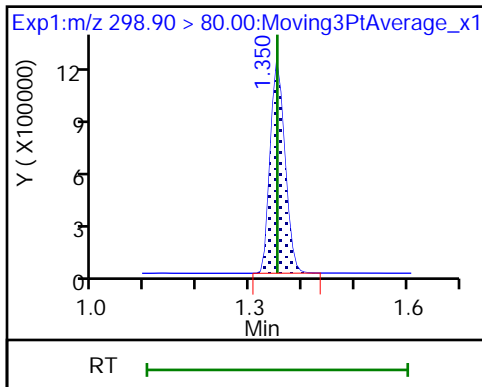
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

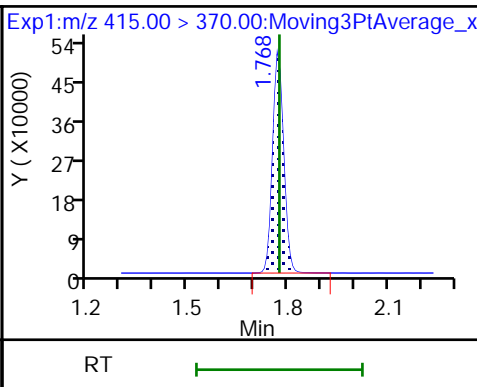
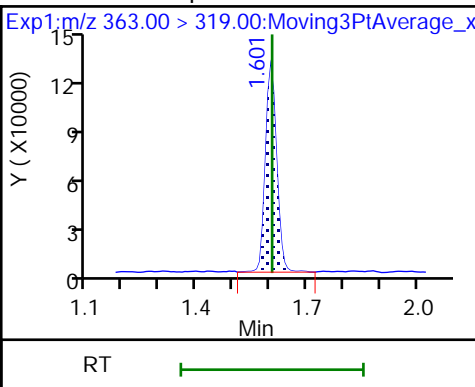
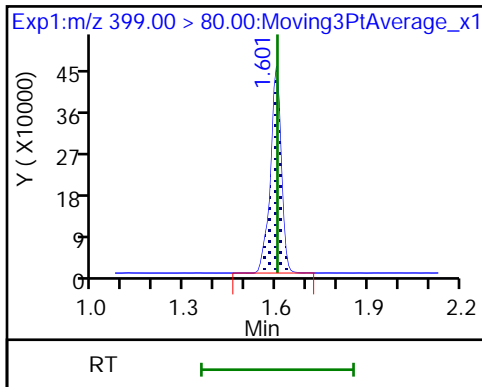
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

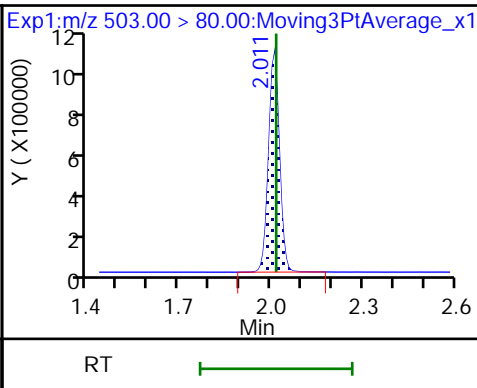
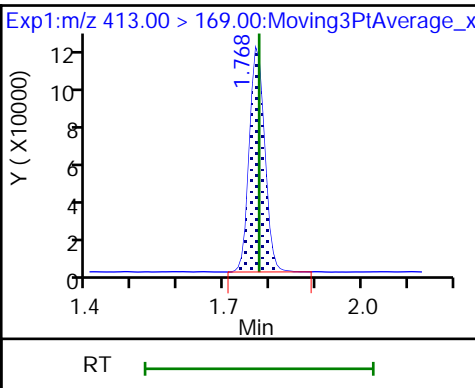
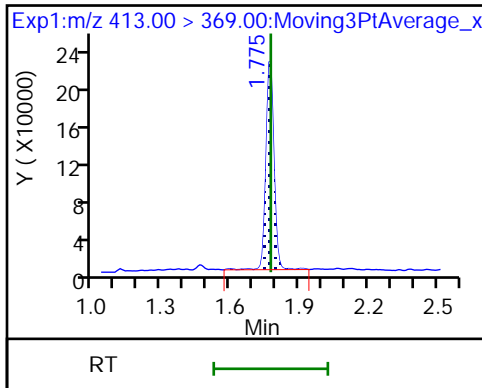
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

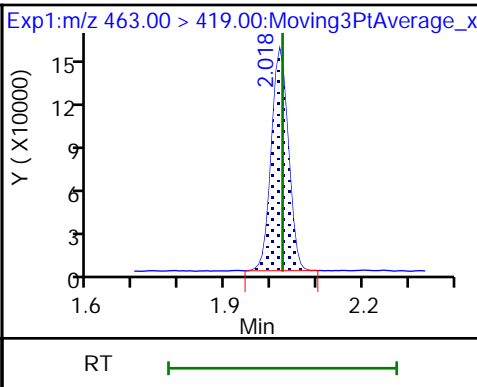
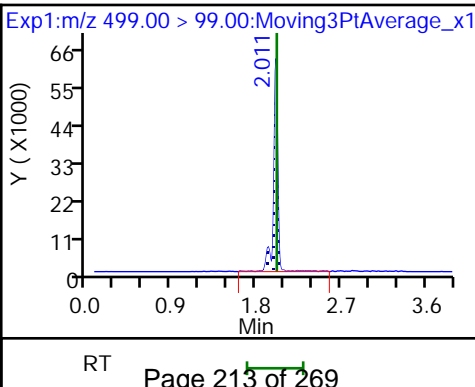
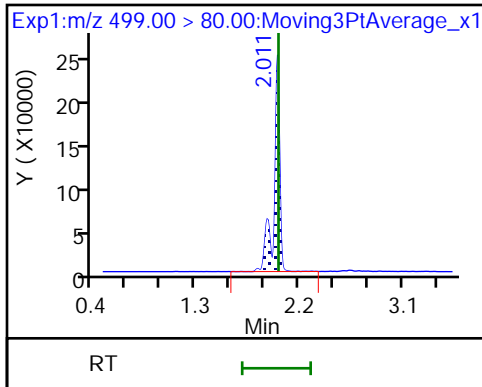
* 7 13C4 PFOS



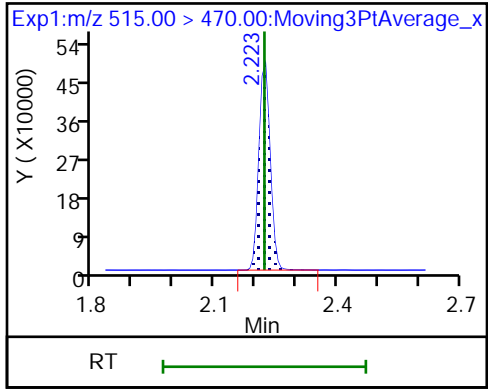
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Lab Sample ID: ICV 320-238469/11 Calibration Date: 08/07/2018 13:26
 Instrument ID: A8_N Calib Start Date: 08/07/2018 12:44
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07
 Lab File ID: 2018.08.07_537CURVE_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	0.997		84.2	100	-15.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	0.9540		8.87	10.0	-11.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.603		18.1	20.2	-10.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	0.9056		16.7	20.2	-17.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	0.9574		17.7	20.2	-12.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7380		18.9	20.2	-6.4	30.0
13C2 PFHxA	Ave	1.100	1.045		9.51	10.0	-4.9	30.0
13C2 PFDA	Ave	0.8189	0.7952		9.71	10.0	-2.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_012.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 07-Aug-2018 13:26:01 ALS Bottle#: 7 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Aug-2018 13:58:48 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 07-Aug-2018 13:58:44

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.352	-0.002	1.000	9545617	84.2		11052	
298.90 > 99.00	1.350	1.352	-0.002	1.000	6956258		1.37(0.00-0.00)	8328	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.472	1.468	0.004	1.000	1254206	9.51		10046	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.603	-0.002	1.000	3092385	18.1		3048	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.605	-0.004	1.000	1144602	8.87		256	
* 6 13C2-PFOA									
415.00 > 370.00	1.775	1.774	0.001		1199776	10.0		6991	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.775	1.775	0.0	1.000	2191205	16.7		318	
413.00 > 169.00	1.775	1.775	0.0	1.000	1130846		1.94(0.00-0.00)	2324	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.016	-0.005		2744266	28.7		3771	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.011	2.018	-0.007	1.000	1847813	17.7		1537	
499.00 > 99.00	2.011	2.018	-0.007	1.000	358705		5.15(0.00-0.00)	799	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.024	-0.006	1.000	1785291	18.9		315	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.220	-0.005	1.000	954033	9.71		8012	

Reagents:

LC537-ICV_00032

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_012.d

Injection Date: 07-Aug-2018 13:26:01

Instrument ID: A8_N

Lims ID: ICV

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 7

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

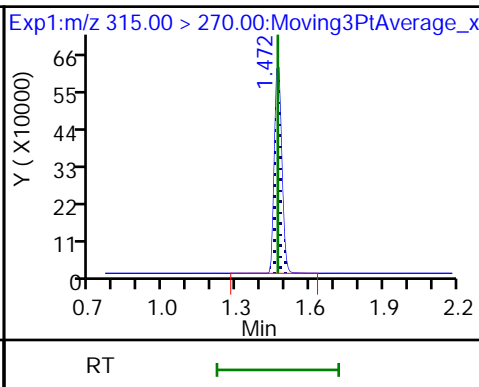
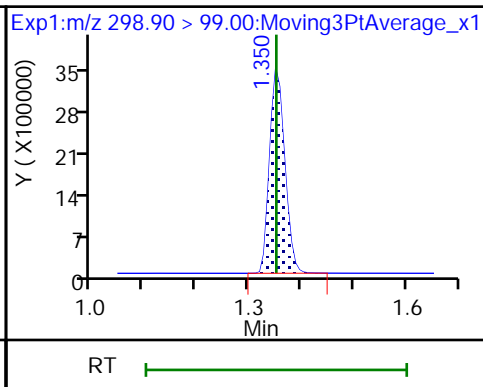
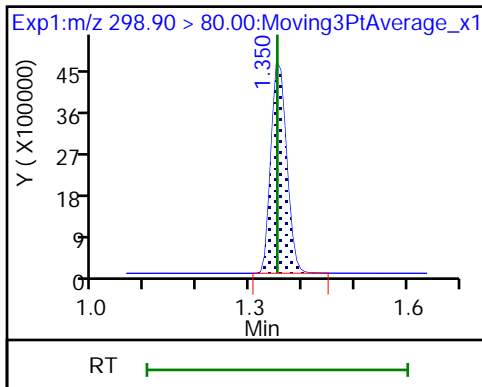
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

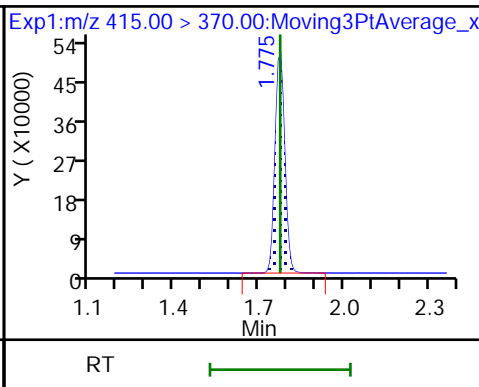
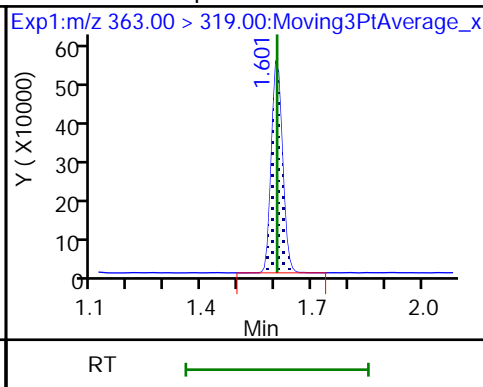
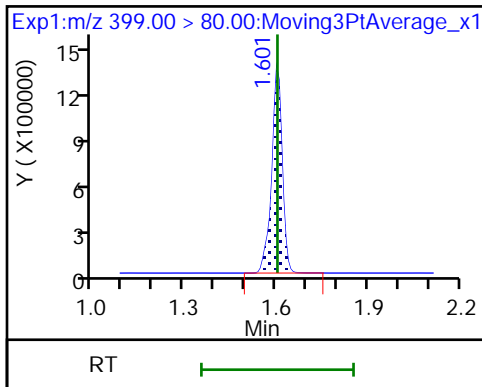
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

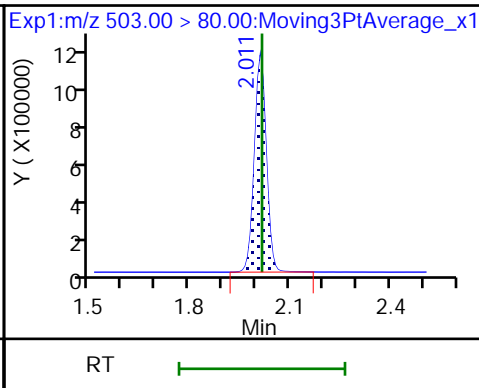
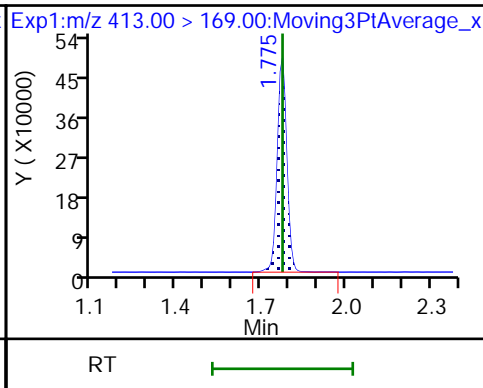
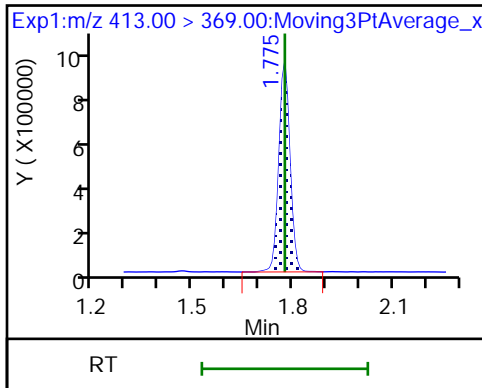
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

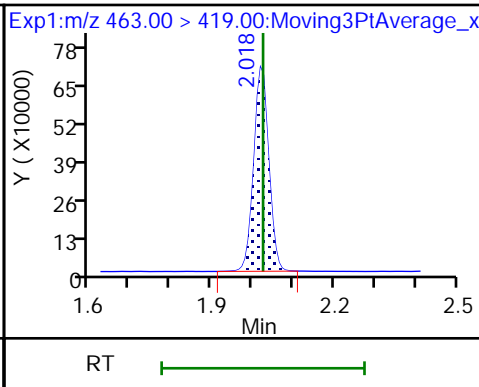
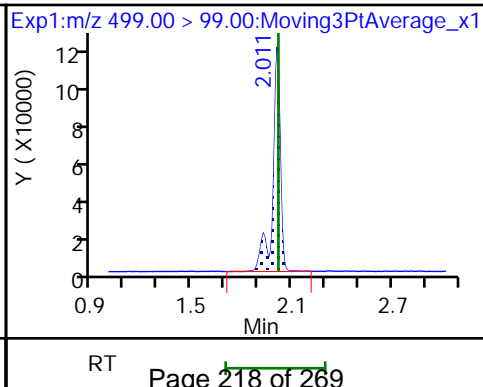
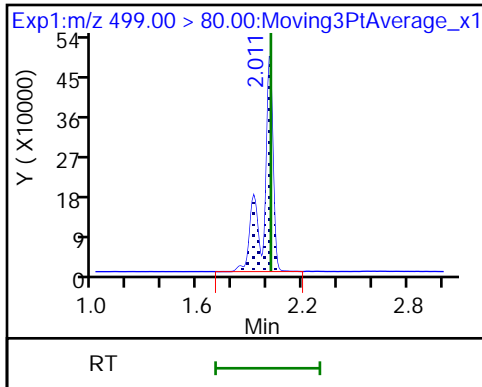
* 7 13C4 PFOS



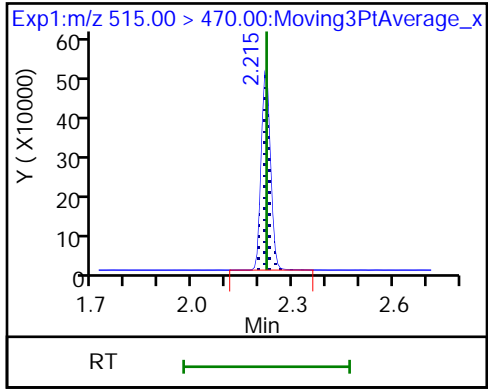
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-238776/1 Calibration Date: 08/08/2018 03:07
 Instrument ID: A8_N Calib Start Date: 08/07/2018 12:44
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07
 Lab File ID: 2018.08.07_537C_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.243		21.0	20.0	4.9	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.031		2.07	2.16	-4.2	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.702		6.42	6.72	-4.5	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.034		4.15	4.40	-5.6	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.067		8.59	8.79	-2.2	50.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7564		4.22	4.40	-4.0	50.0
13C2 PFHxA	Ave	1.100	1.051		9.56	10.0	-4.4	30.0
13C2 PFDA	Ave	0.8189	0.7584		9.26	10.0	-7.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62320.b\2018.08.07_537C_003.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 08-Aug-2018 03:07:27 ALS Bottle#: 2 Worklist Smp#: 1
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCVL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62320.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:16:03 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	2397538	21.0		2307	
298.90 > 99.00	1.350	1.350	0.0	1.000	1646394		1.46(0.00-0.00)	2304	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1294337	9.56		12769	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.601	-0.008	1.000	1103063	6.42		1158	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.601	-0.008	1.000	274260	2.07		55.0	
* 6 13C2-PFOA									
415.00 > 370.00	1.760	1.768	-0.008		1231833	10.0		8035	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.760	1.768	-0.008	1.000	560639	4.15		92.4	
413.00 > 169.00	1.760	1.768	-0.008	1.000	287177		1.95(0.00-0.00)	676	
* 7 13C4 PFOS									
503.00 > 80.00	1.995	1.995	0.0		2765004	28.7		3893	
9 Perfluorononanoic acid									
463.00 > 419.00	2.003	2.011	-0.008	1.000	409995	4.22		57.0	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	1.995	2.018	-0.023	1.000	903781	8.59		602	
499.00 > 99.00	1.995	2.018	-0.023	1.000	199367		4.53(0.00-0.00)	492	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.208	2.215	-0.007	1.000	934259	9.26		7309	

Reagents:

LC537-L2_00022 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62320.b\2018.08.07_537C_003.d

Injection Date: 08-Aug-2018 03:07:27

Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 2

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

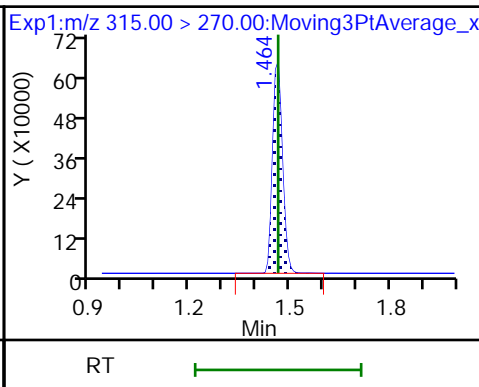
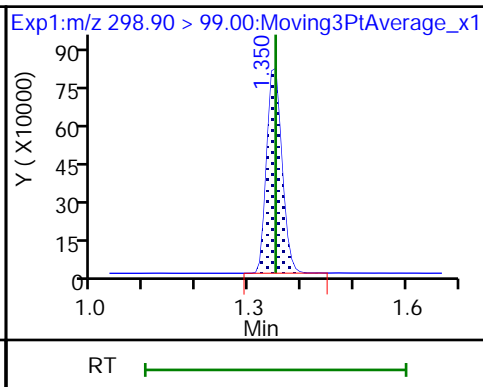
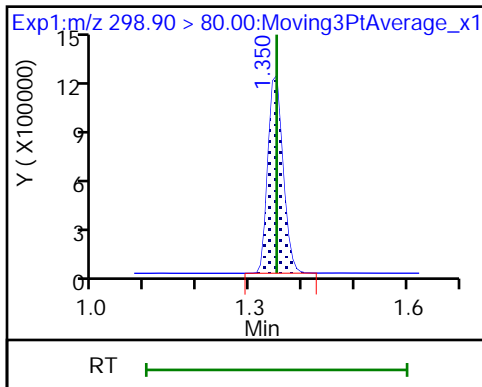
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

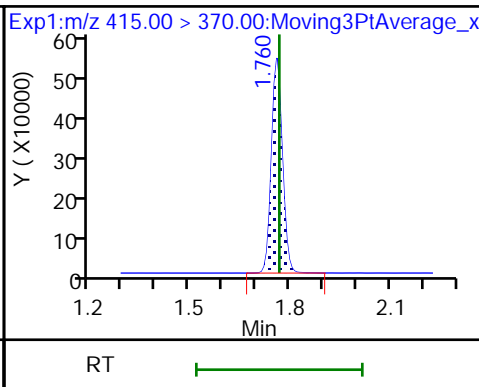
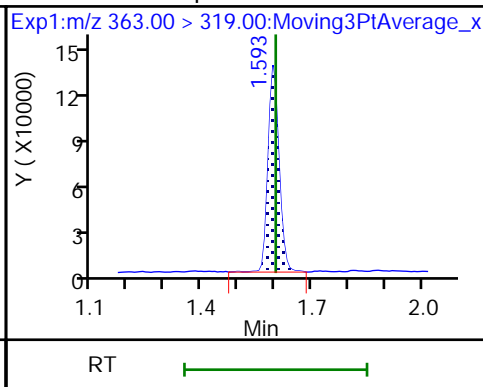
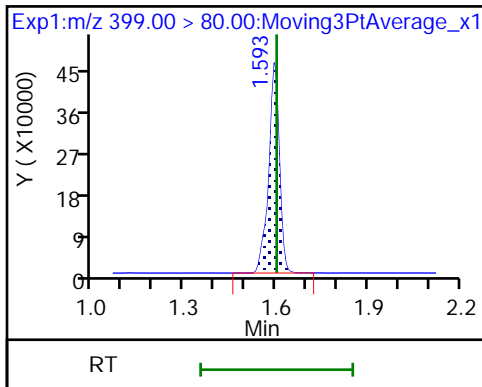
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

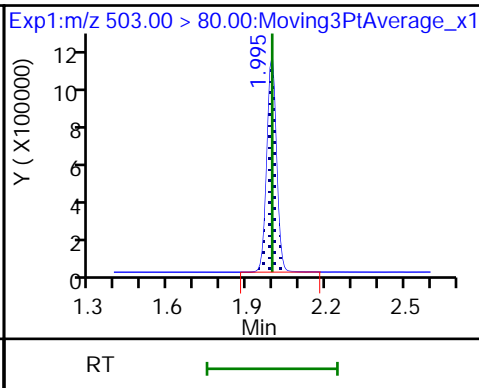
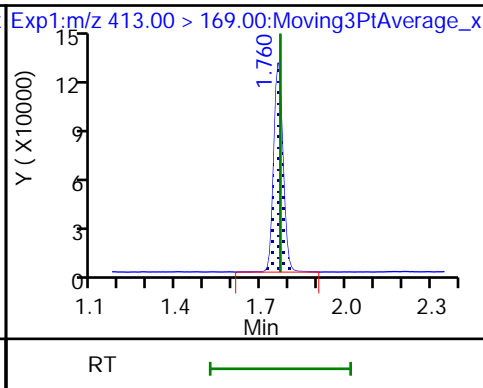
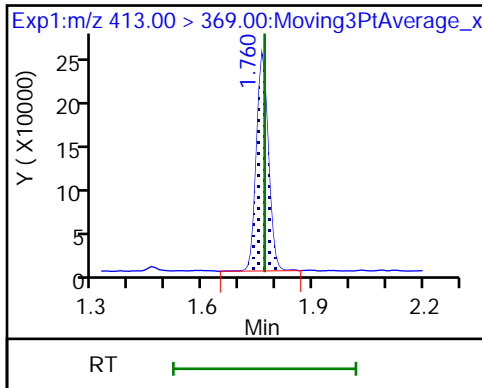
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

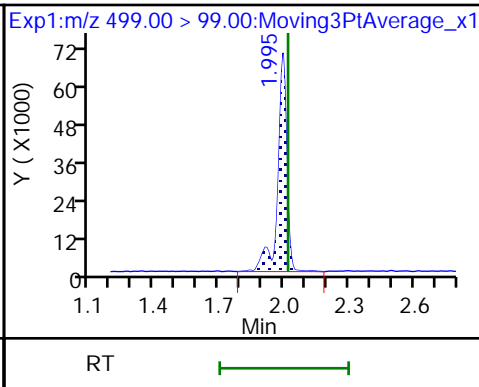
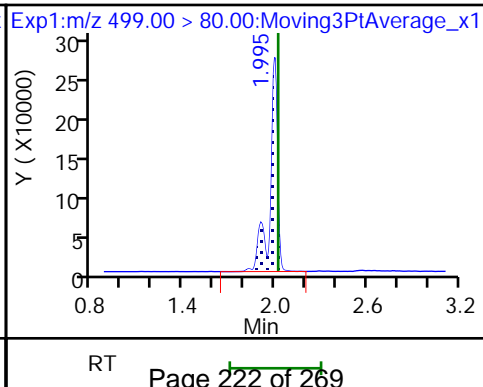
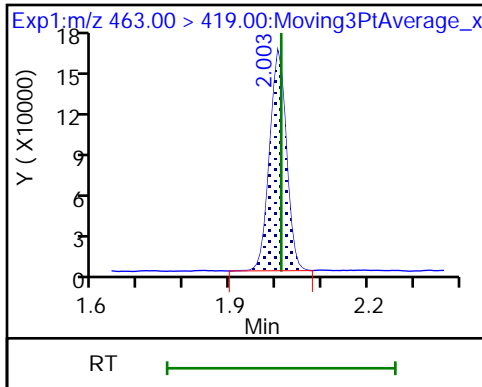
* 7 13C4 PFOS



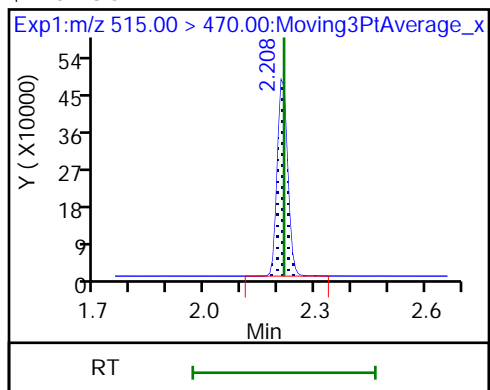
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Lab Sample ID: CCV 320-238610/1 Calibration Date: 08/08/2018 04:31
 Instrument ID: A8_N Calib Start Date: 08/07/2018 12:44
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07
 Lab File ID: 2018.08.07_537C_021.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.228		46.7	45.0	3.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.077		4.87	4.86	0.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.742		14.8	15.1	-2.3	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.069		9.66	9.90	-2.4	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.062		19.2	19.8	-2.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.8206		10.3	9.90	4.1	30.0
13C2 PFHxA	Ave	1.100	1.088		9.89	10.0	-1.1	30.0
13C2 PFDA	Ave	0.8189	0.7990		9.76	10.0	-2.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_021.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 08-Aug-2018 04:31:36 ALS Bottle#: 3 Worklist Smp#: 1
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L3
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	4994756	46.7		4298	
298.90 > 99.00	1.350	1.350	0.0	1.000	3585550		1.39(0.00-0.00)	4903	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1201540	9.89		11168	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	2380823	14.8		2199	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.593	0.0	1.000	578442	4.87		107	
* 6 13C2-PFOA									
415.00 > 370.00	1.760	1.760	0.0		1104849	10.0		7206	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.760	1.760	0.0	1.000	1169317	9.66		180	
413.00 > 169.00	1.760	1.760	0.0	1.000	599313		1.95(0.00-0.00)	1508	
* 7 13C4 PFOS									
503.00 > 80.00	1.988	1.988	0.0		2591082	28.7		3465	
9 Perfluorononanoic acid									
463.00 > 419.00	1.995	1.995	0.0	1.000	897572	10.3		116	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	1.988	2.018	-0.030	1.000	1896420	19.2		1305	
499.00 > 99.00	1.988	2.018	-0.030	1.000	419600		4.52(0.00-0.00)	1007	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.208	2.208	0.0	1.000	882768	9.76		7494	

Reagents:

LC537-L3_00025 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_021.d

Injection Date: 08-Aug-2018 04:31:36

Instrument ID: A8_N

Lims ID: CCV L3

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 3

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

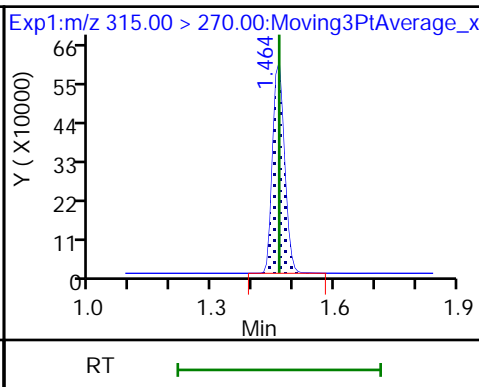
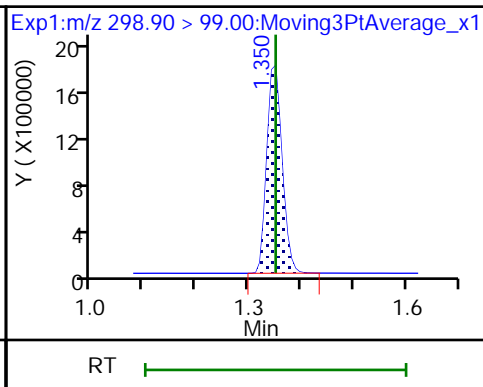
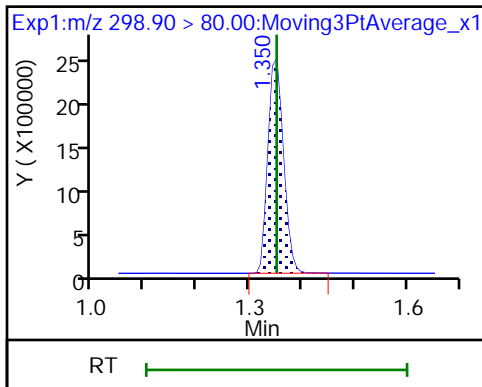
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

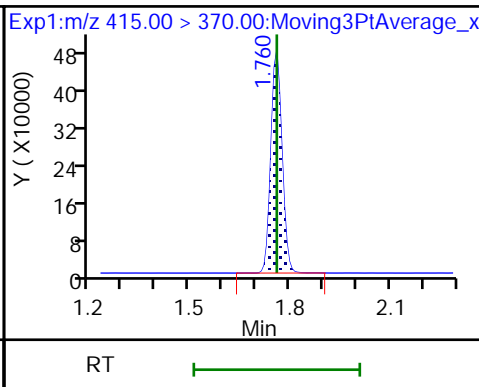
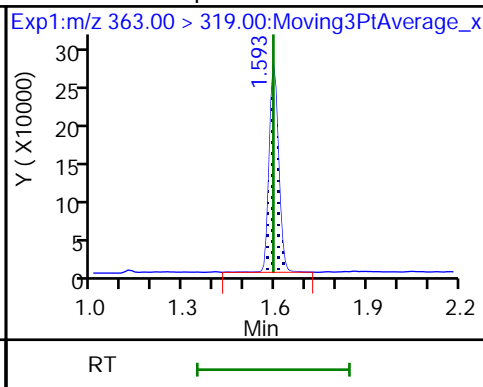
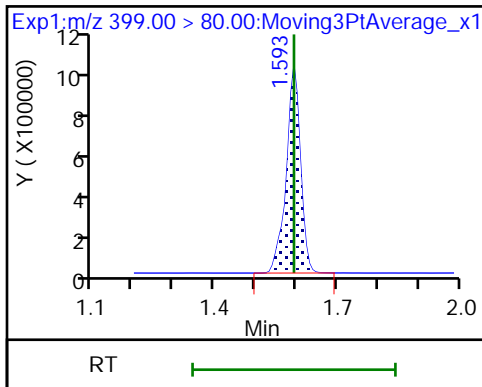
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

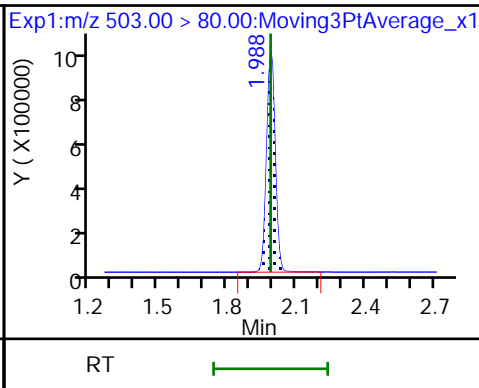
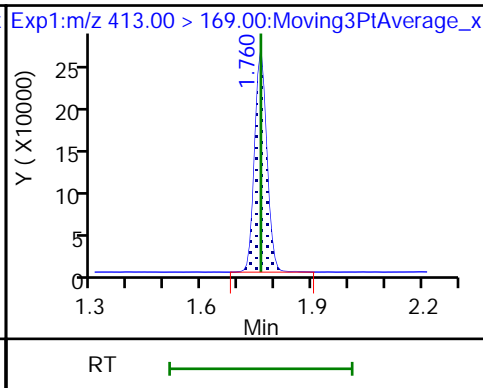
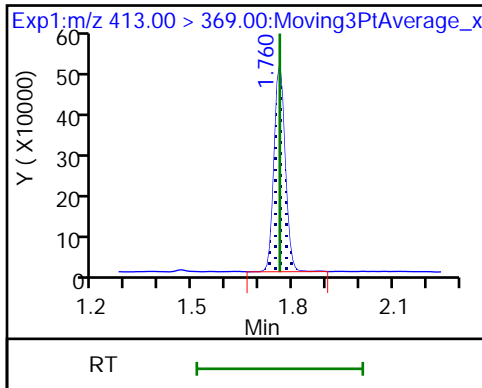
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

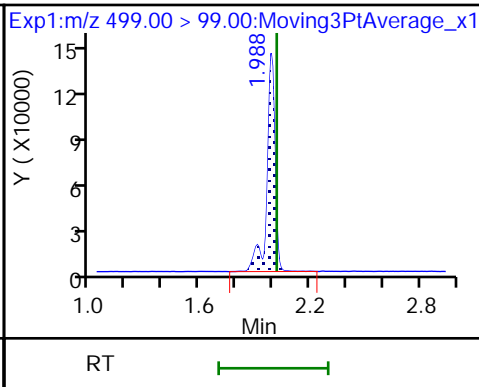
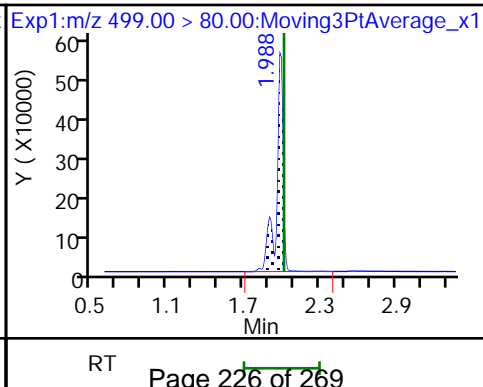
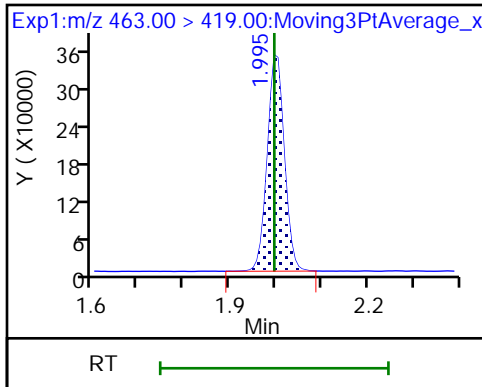
* 7 13C4 PFOS



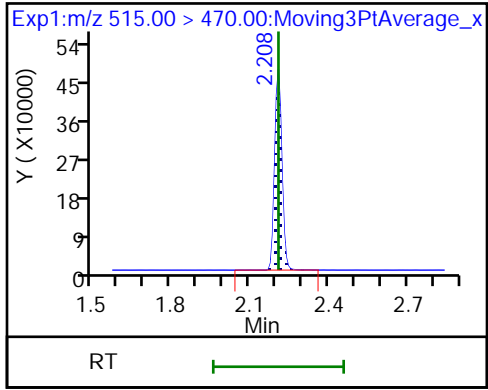
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Lab Sample ID: CCV 320-238610/13 Calibration Date: 08/08/2018 05:27
 Instrument ID: A8_N Calib Start Date: 08/07/2018 12:44
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07
 Lab File ID: 2018.08.07_537C_033.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.165		133	135	-1.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.063		14.4	14.6	-1.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.839		46.8	45.4	3.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.094		29.7	29.7	-0.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.131		61.4	59.3	3.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7713		29.1	29.7	-2.1	30.0
13C2 PFHxA	Ave	1.100	1.074		9.77	10.0	-2.3	30.0
13C2 PFDA	Ave	0.8189	0.8057		9.84	10.0	-1.6	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Lab Sample ID: CCV 320-238612/13 Calibration Date: 08/08/2018 05:27
 Instrument ID: A8_N Calib Start Date: 08/07/2018 12:44
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07
 Lab File ID: 2018.08.07_537C_033.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.165		133	135	-1.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.063		14.4	14.6	-1.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.839		46.8	45.4	3.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.094		29.7	29.7	-0.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.131		61.4	59.3	3.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7713		29.1	29.7	-2.1	30.0
13C2 PFHxA	Ave	1.100	1.074		9.77	10.0	-2.3	30.0
13C2 PFDA	Ave	0.8189	0.8057		9.84	10.0	-1.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_033.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 08-Aug-2018 05:27:41 ALS Bottle#: 5 Worklist Smp#: 13
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	13113634	132.9		9065	
298.90 > 99.00	1.350	1.350	0.0	1.000	9290556		1.41(0.00-0.00)	10709	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1178294	9.77		10521	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	6953371	46.8		5588	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.593	0.0	1.000	1700507	14.4		329	
* 6 13C2-PFOA									
415.00 > 370.00	1.760	1.760	0.0		1097335	10.0		7449	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.760	1.760	0.0	1.000	3567051	29.7		559	
413.00 > 169.00	1.760	1.760	0.0	1.000	1758505		2.03(0.00-0.00)	4194	
* 7 13C4 PFOS									
503.00 > 80.00	1.995	1.995	0.0		2390195	28.7		3201	
9 Perfluorononanoic acid									
463.00 > 419.00	2.003	2.003	0.0	1.000	2513613	29.1		337	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	1.995	2.018	-0.023	1.000	5587655	61.4		3127	
499.00 > 99.00	1.995	2.018	-0.023	1.000	1173161		4.76(0.00-0.00)	2696	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.208	2.208	0.0	1.000	884063	9.84		6910	

Reagents:

LC537-L5_00026 Amount Added: 1.00 Units: mL

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_033.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 08-Aug-2018 05:27:41 ALS Bottle#: 5 Worklist Smp#: 13
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	13113634	132.9		9065	
298.90 > 99.00	1.350	1.350	0.0	1.000	9290556		1.41(0.00-0.00)	10709	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1178294	9.77		10521	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	6953371	46.8		5588	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.593	0.0	1.000	1700507	14.4		329	
* 6 13C2-PFOA									
415.00 > 370.00	1.760	1.760	0.0		1097335	10.0		7449	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.760	1.760	0.0	1.000	3567051	29.7		559	
413.00 > 169.00	1.760	1.760	0.0	1.000	1758505		2.03(0.00-0.00)	4194	
* 7 13C4 PFOS									
503.00 > 80.00	1.995	1.995	0.0		2390195	28.7		3201	
9 Perfluorononanoic acid									
463.00 > 419.00	2.003	2.003	0.0	1.000	2513613	29.1		337	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	1.995	2.018	-0.023	1.000	5587655	61.4		3127	
499.00 > 99.00	1.995	2.018	-0.023	1.000	1173161		4.76(0.00-0.00)	2696	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.208	2.208	0.0	1.000	884063	9.84		6910	

Reagents:

LC537-L5_00026 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_033.d

Injection Date: 08-Aug-2018 05:27:41

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 5

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

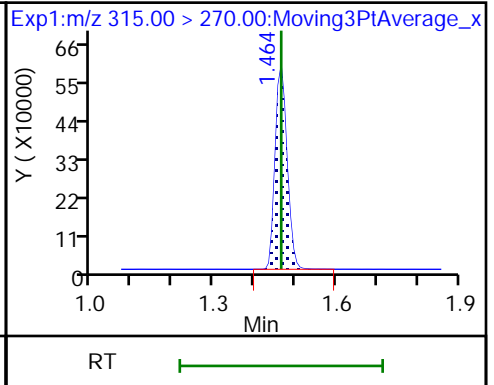
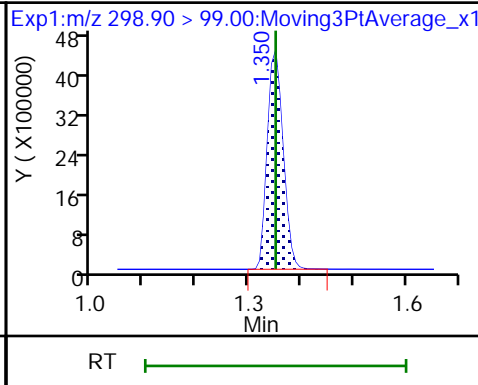
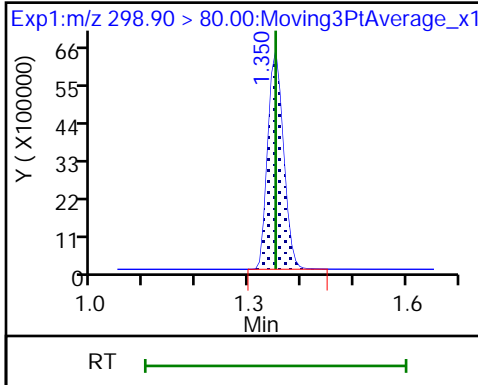
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

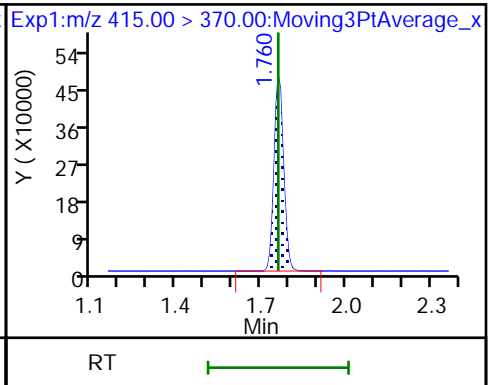
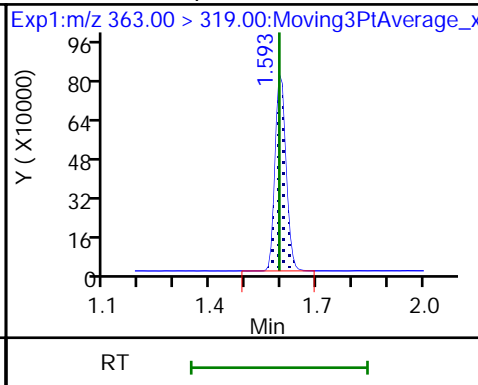
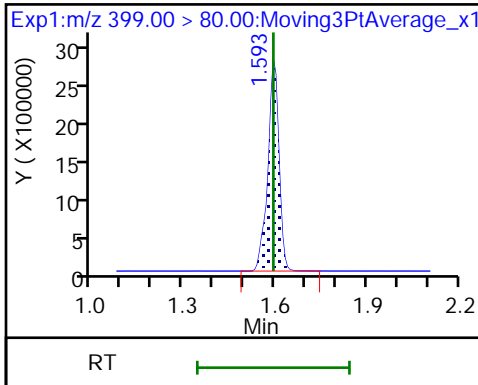
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

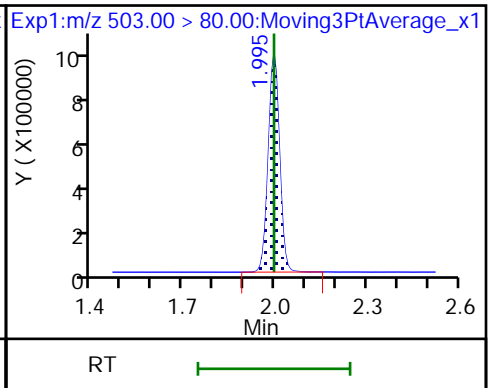
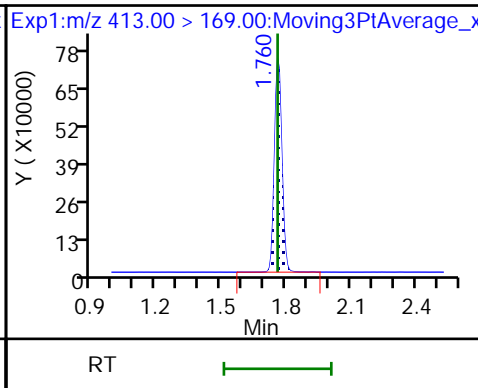
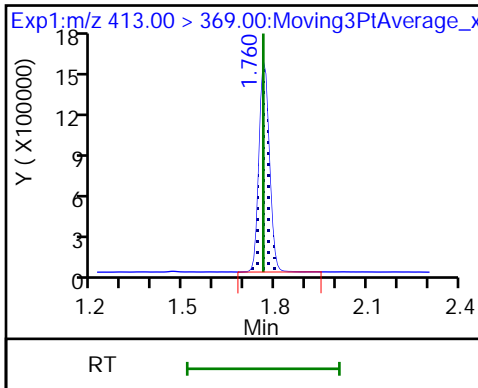
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

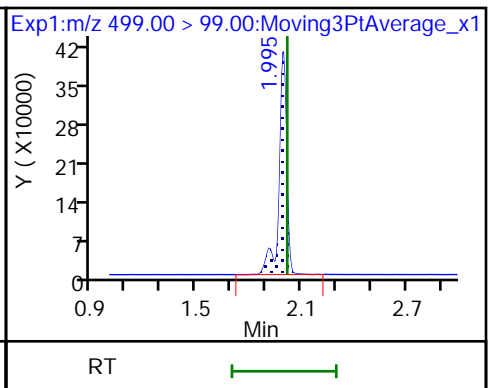
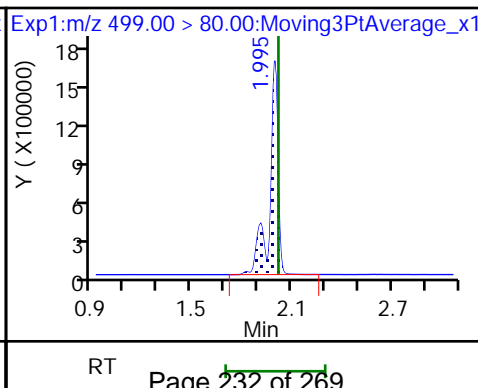
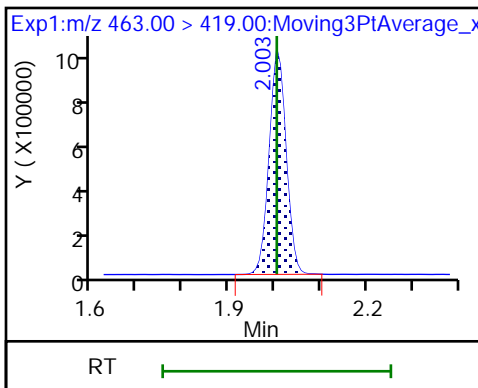
* 7 13C4 PFOS



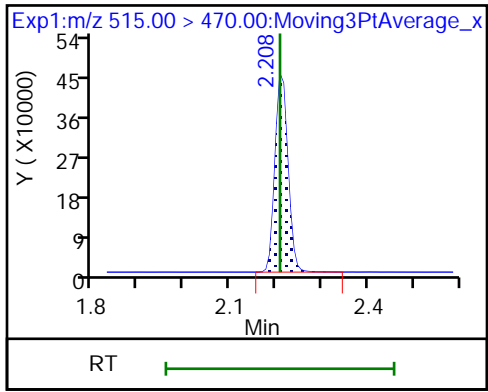
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_033.d

Injection Date: 08-Aug-2018 05:27:41

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 5

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

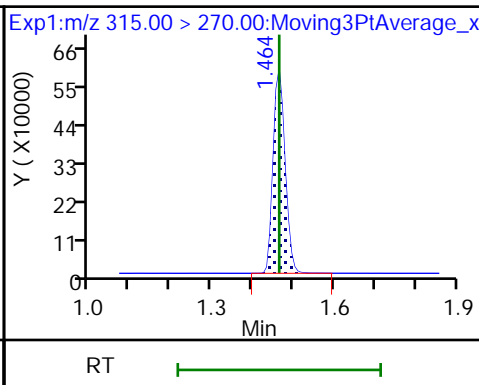
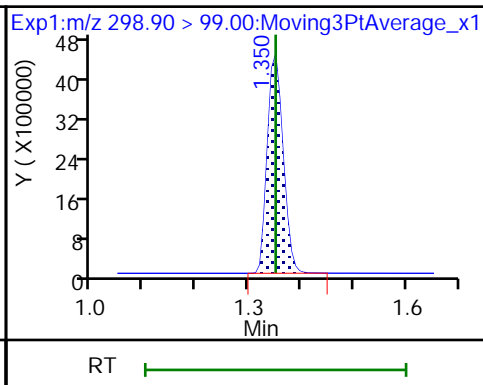
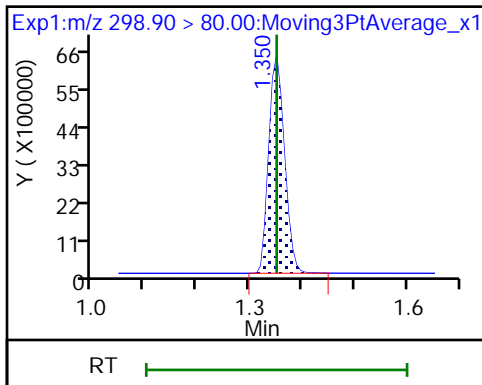
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

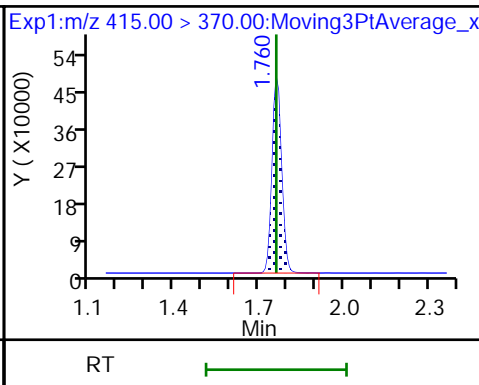
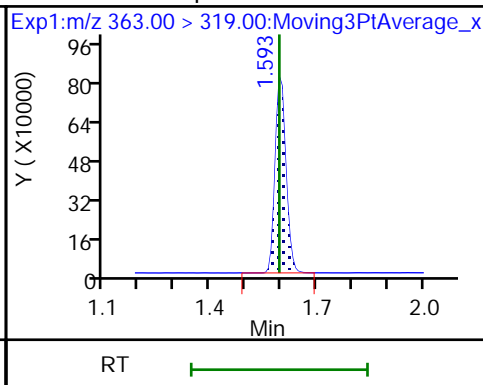
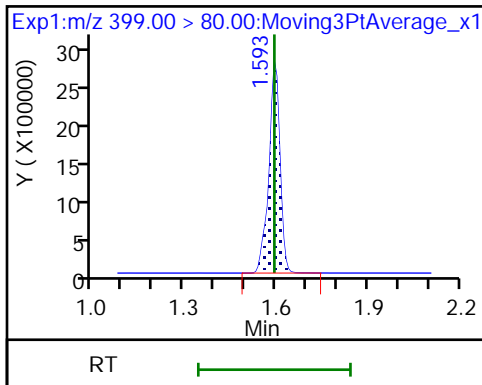
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

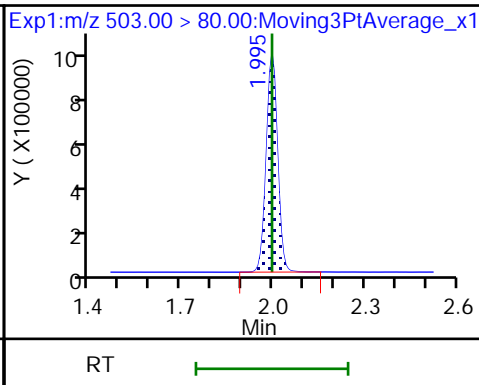
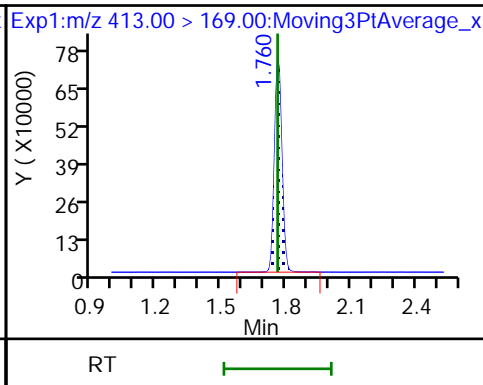
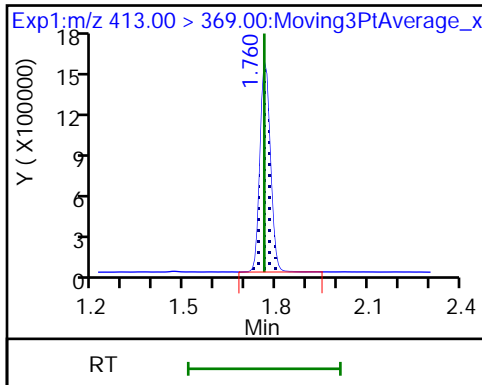
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

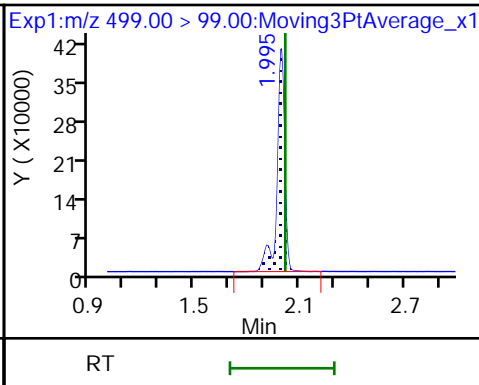
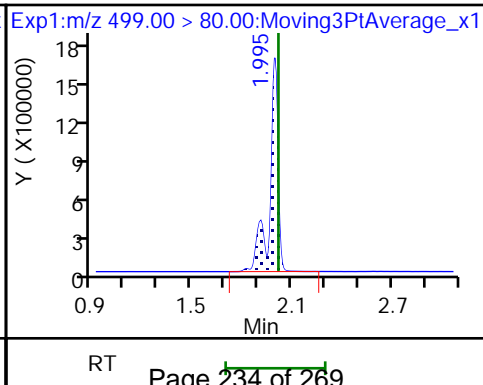
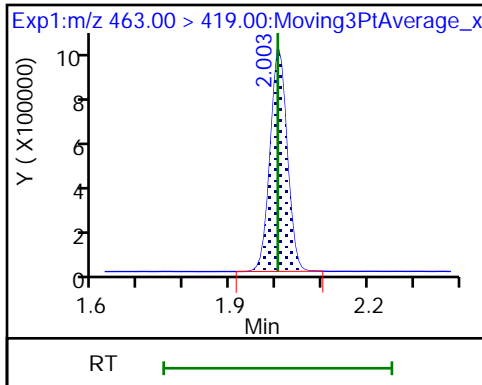
* 7 13C4 PFOS



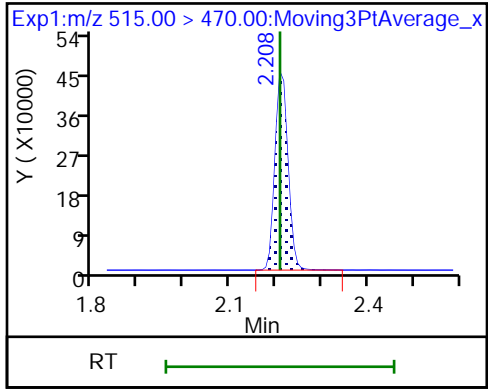
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Lab Sample ID: CCV 320-238612/21 Calibration Date: 08/08/2018 06:05
 Instrument ID: A8_N Calib Start Date: 08/07/2018 12:44
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07
 Lab File ID: 2018.08.07_537C_041.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.278		48.6	45.0	7.9	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.067		4.82	4.86	-0.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.744		14.8	15.1	-2.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.044		9.44	9.90	-4.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.080		19.6	19.8	-1.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7579		9.52	9.90	-3.8	30.0
13C2 PFHxA	Ave	1.100	1.058		9.62	10.0	-3.8	30.0
13C2 PFDA	Ave	0.8189	0.7925		9.68	10.0	-3.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_041.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 08-Aug-2018 06:05:02 ALS Bottle#: 3 Worklist Smp#: 21
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L3
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:54:17 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.343	1.343	0.0	1.000	4968469	48.6		4205	
298.90 > 99.00	1.343	1.343	0.0	1.000	3380389		1.47(0.00-0.00)	5174	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.457	1.457	0.0	1.000	1158289	9.62		10289	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.586	1.586	0.0	1.000	2277114	14.8		2055	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.586	1.586	0.0	1.000	567831	4.82		112	
* 6 13C2-PFOA									
415.00 > 370.00	1.753	1.753	0.0		1095270	10.0		6874	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.753	1.753	0.0	1.000	1132415	9.44		174	
413.00 > 169.00	1.753	1.753	0.0	1.000	585576		1.93(0.00-0.00)	1596	
* 7 13C4 PFOS									
503.00 > 80.00	1.988	1.988	0.0		2475586	28.7		3081	
9 Perfluorononanoic acid									
463.00 > 419.00	1.995	1.995	0.0	1.000	821758	9.52		106	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	1.988	2.018	-0.030	1.000	1843379	19.6		1183	
499.00 > 99.00	1.988	2.018	-0.030	1.000	400522		4.60(0.00-0.00)	1012	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.200	2.200	0.0	1.000	868002	9.68		6492	

Reagents:

LC537-L3_00025 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_041.d

Injection Date: 08-Aug-2018 06:05:02

Instrument ID: A8_N

Lims ID: CCV L3

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 3

Worklist Smp#: 21

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

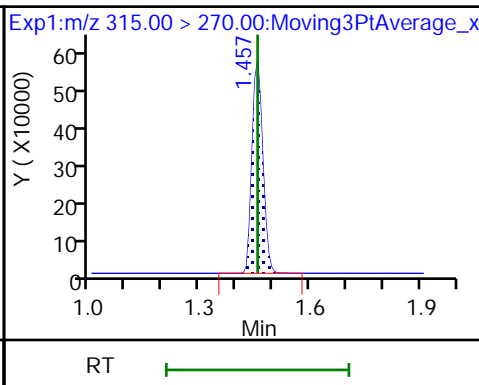
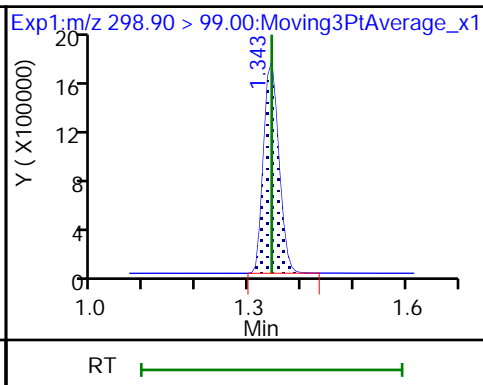
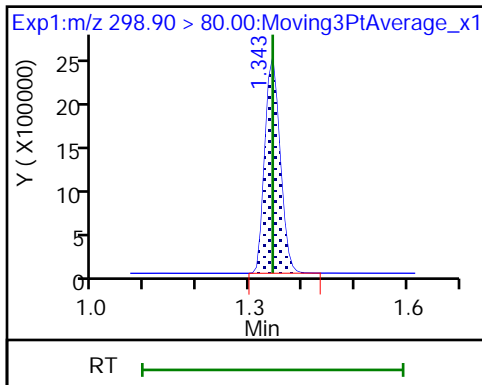
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

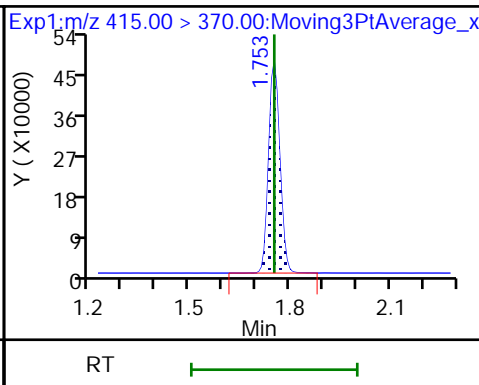
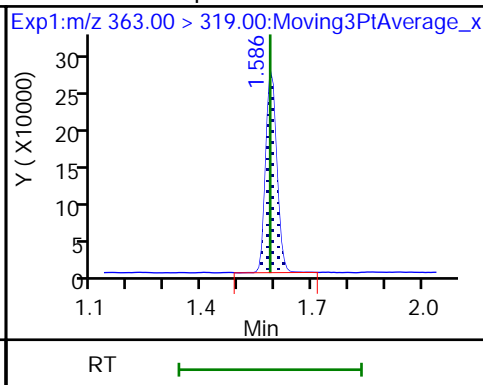
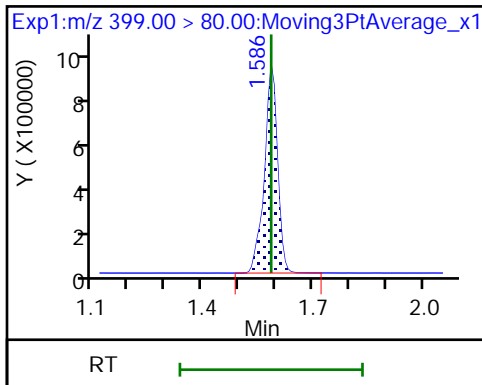
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

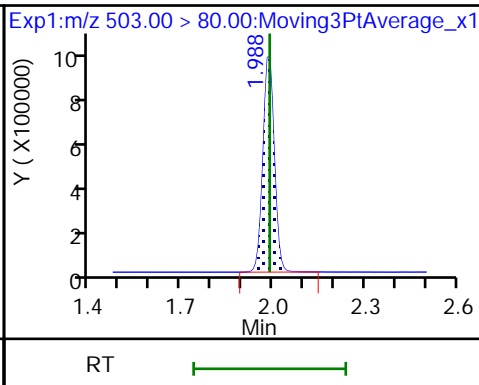
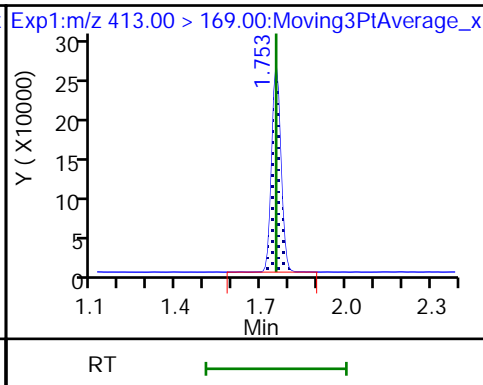
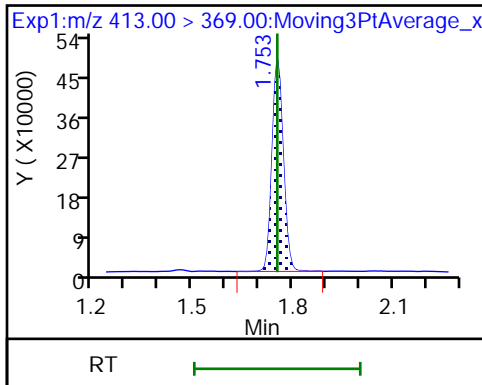
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

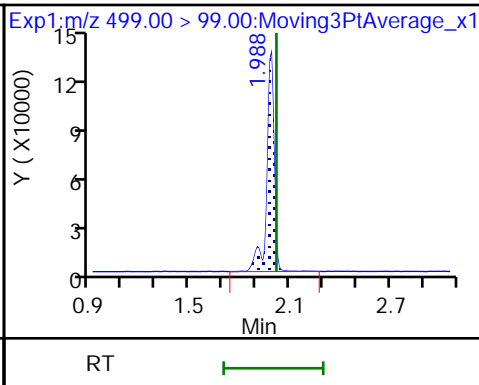
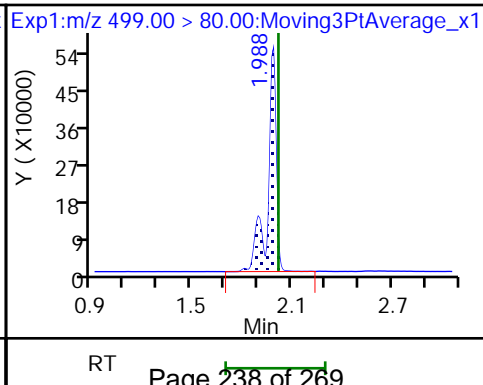
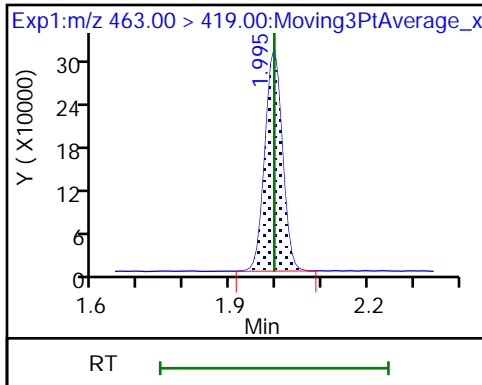
* 7 13C4 PFOS



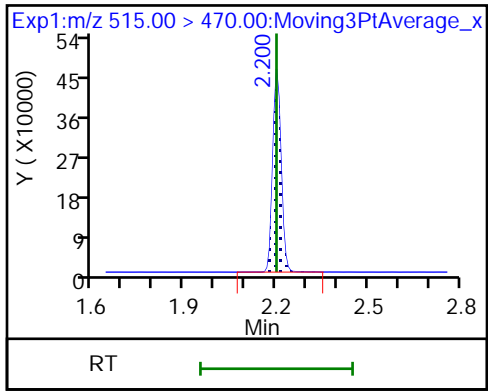
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-237969/1-A
 Matrix: Water Lab File ID: 2018.08.07_537C_023.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 250 (mL) Date Analyzed: 08/08/2018 04:40
 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.: 238610 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	90		70-130
STL00996	13C2 PFDA	95		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_023.d
 Lims ID: MB 320-237969/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 08-Aug-2018 04:40:58 ALS Bottle#: 12 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-237969/1-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.464	1.464	0.0	1.000	1298940	9.02	12322	
* 6 13C2-PFOA	415.00 > 370.00	1.760	1.760	0.0		1310053	10.0	7352	
* 7 13C4 PFOS	503.00 > 80.00	1.995	1.988	0.007		2893199	28.7	3463	
\$ 10 13C2 PFDA	515.00 > 470.00	2.208	2.208	0.0	1.000	1015055	9.46	7319	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_023.d

Injection Date: 08-Aug-2018 04:40:58

Instrument ID: A8_N

Lims ID: MB 320-237969/1-A

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 12

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

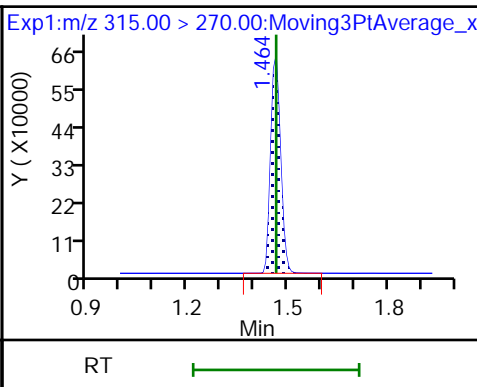
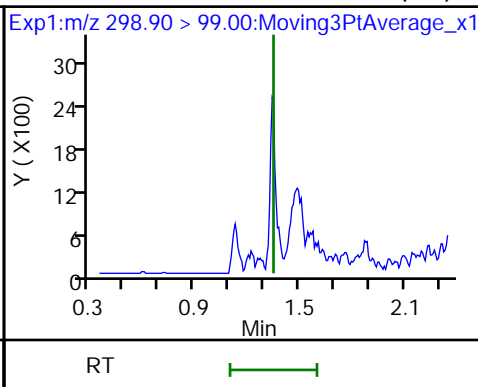
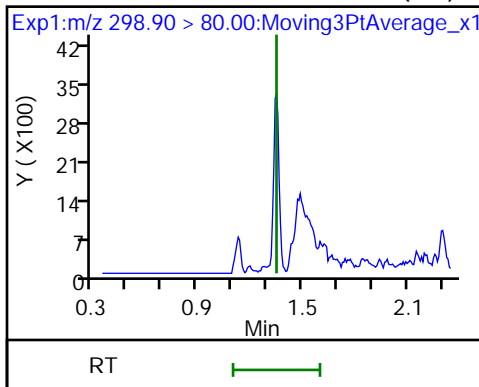
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

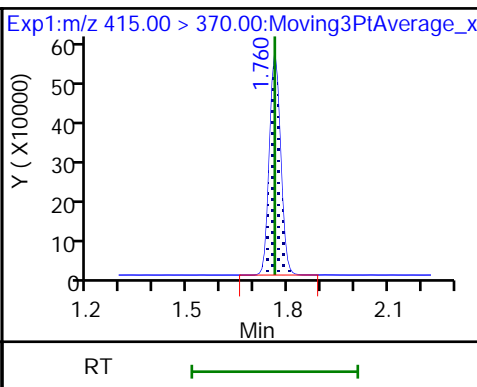
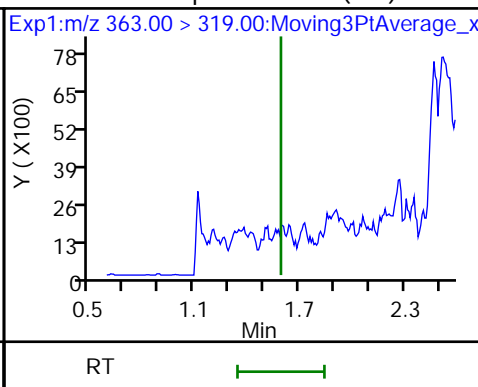
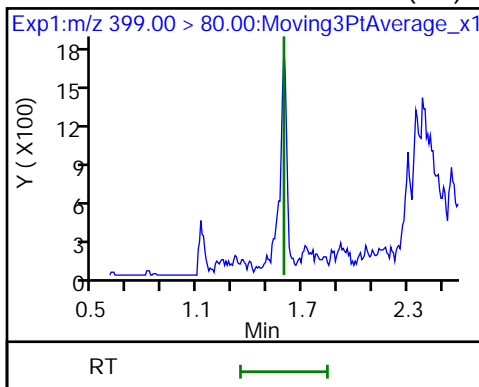
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

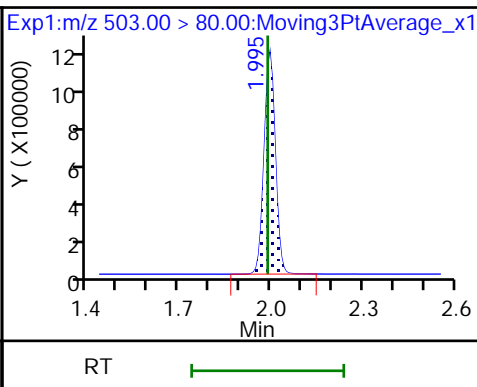
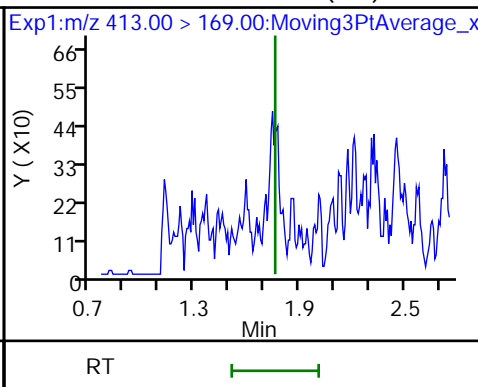
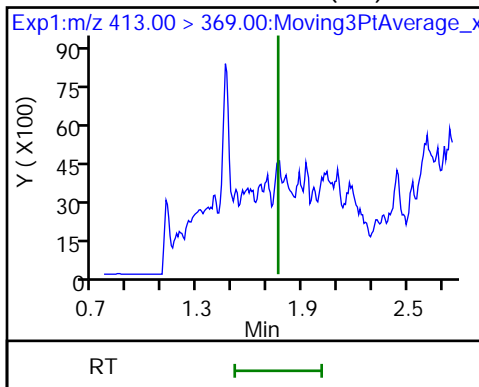
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

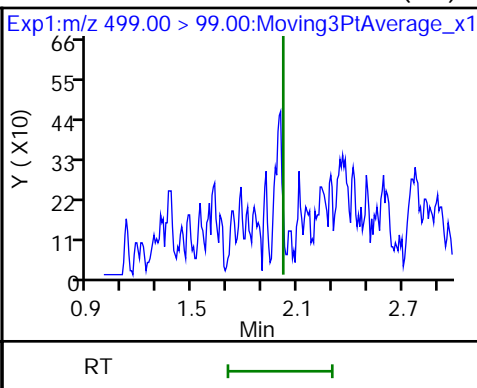
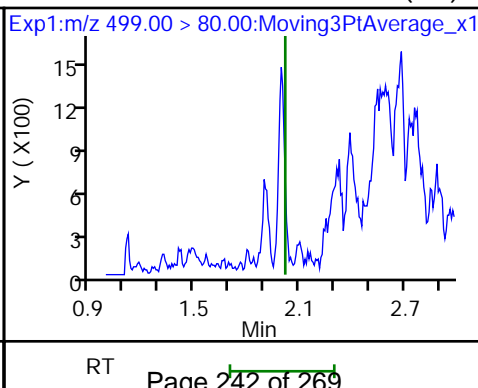
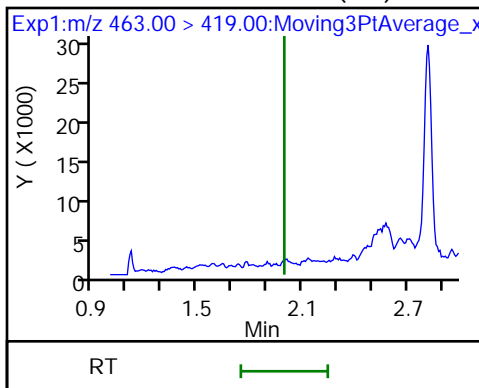
* 7 13C4 PFOS



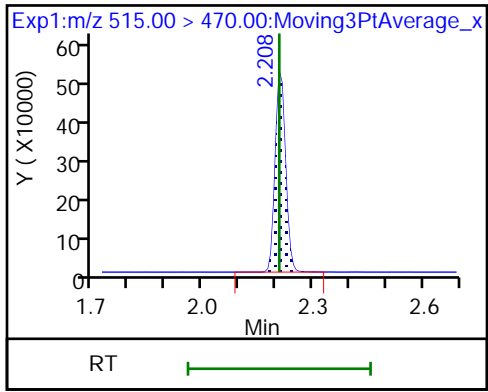
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_023.d
 Lims ID: MB 320-237969/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 08-Aug-2018 04:40:58 ALS Bottle#: 12 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-237969/1-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.02	90.17
\$ 10 13C2 PFDA	10.0	9.46	94.62

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 320-237969/2-A
 Matrix: Water Lab File ID: 2018.08.07_537C_024.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 250 (mL) Date Analyzed: 08/08/2018 04:45
 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.: 238610 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	138		40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	68.3		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	64.4		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	107		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	32.1		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	321		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	88		70-130
STL00996	13C2 PFDA	94		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_024.d
 Lims ID: LCS 320-237969/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 08-Aug-2018 04:45:39 ALS Bottle#: 13 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-237969/2-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	9017809	80.2		7250	
298.90 > 99.00	1.350	1.350	0.0	1.000	6398898		1.41(0.00-0.00)	8061	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1202700	8.75		11593	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	4533918	26.8		3895	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.593	0.008	1.000	1077821	8.02		215	
* 6 13C2-PFOA									
415.00 > 370.00	1.760	1.760	0.0		1249637	10.0		8156	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.760	1.760	0.0	1.000	2336196	17.1		351	
413.00 > 169.00	1.760	1.760	0.0	1.000	1183566		1.97(0.00-0.00)	2916	
* 7 13C4 PFOS									
503.00 > 80.00	1.995	1.988	0.007		2724470	28.7		3180	
9 Perfluorononanoic acid									
463.00 > 419.00	2.003	1.995	0.008	1.000	1585093	16.1		167	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	1.995	2.018	-0.023	1.000	3569086	34.4		2171	
499.00 > 99.00	1.995	2.018	-0.023	1.000	754562		4.73(0.00-0.00)	1705	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.208	2.208	0.0	1.000	961840	9.40		8332	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_024.d

Injection Date: 08-Aug-2018 04:45:39

Instrument ID: A8_N

Lims ID: LCS 320-237969/2-A

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 13

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

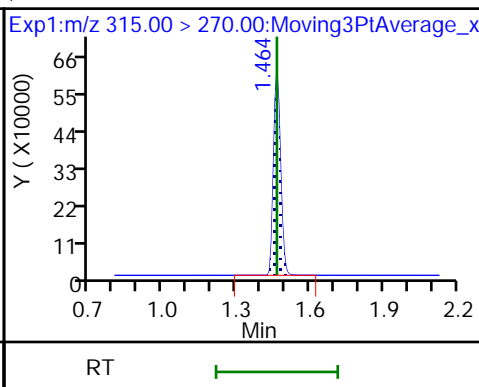
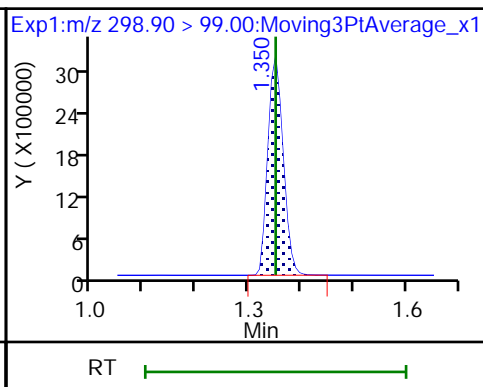
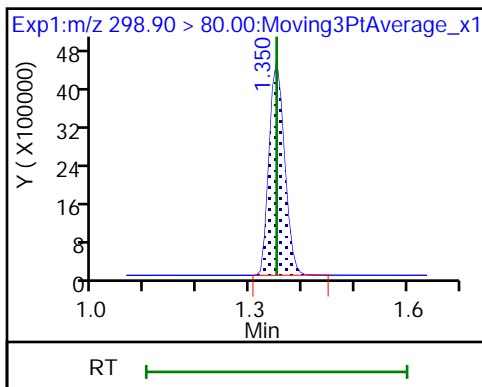
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

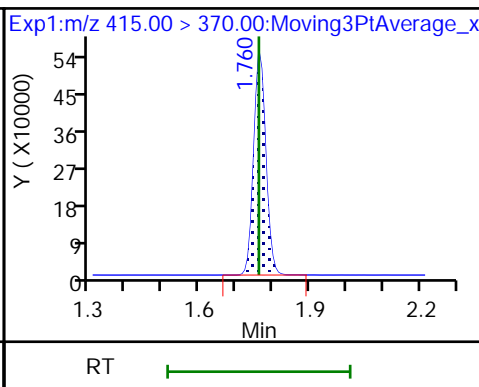
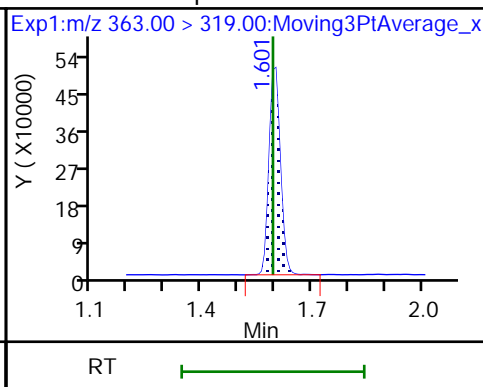
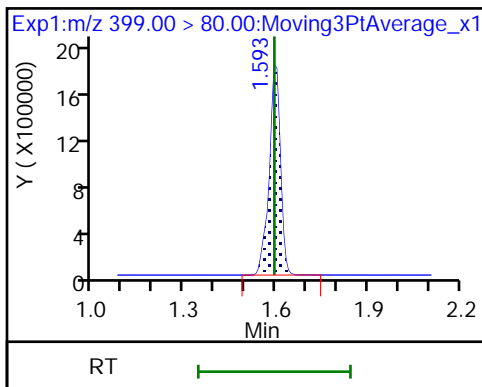
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

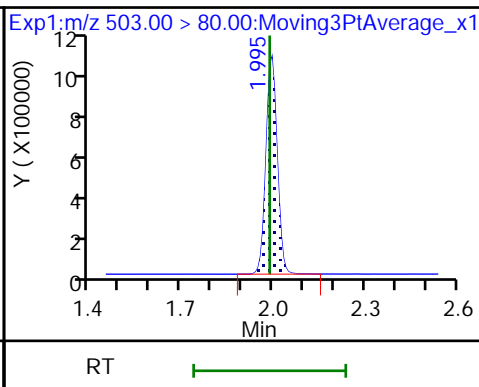
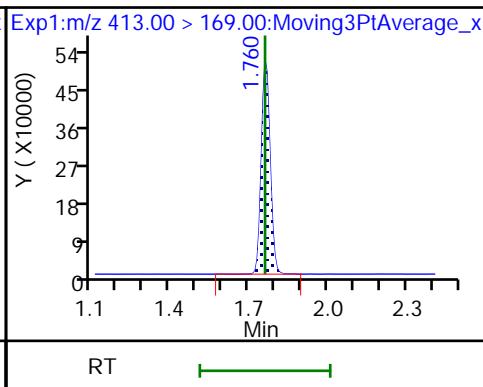
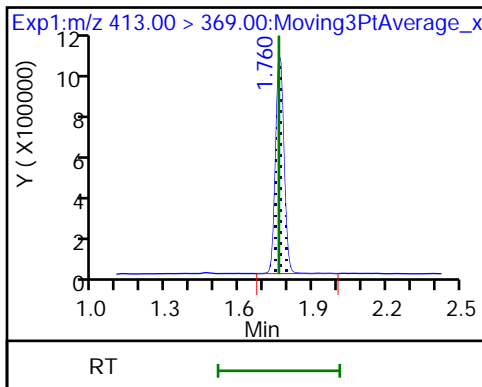
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

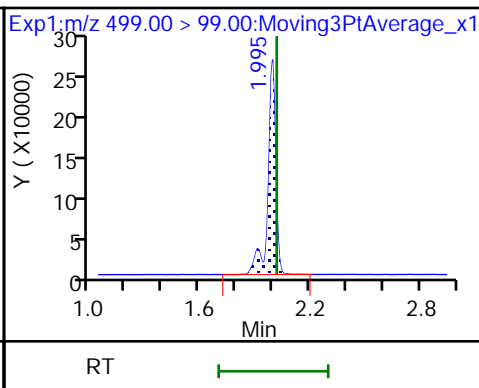
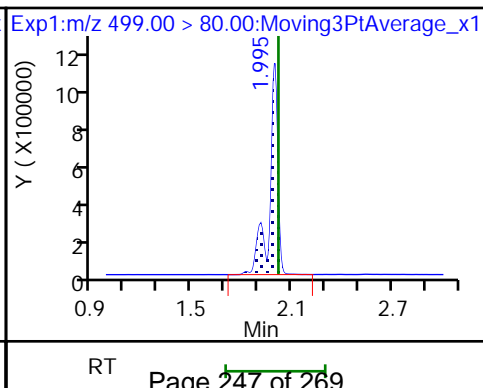
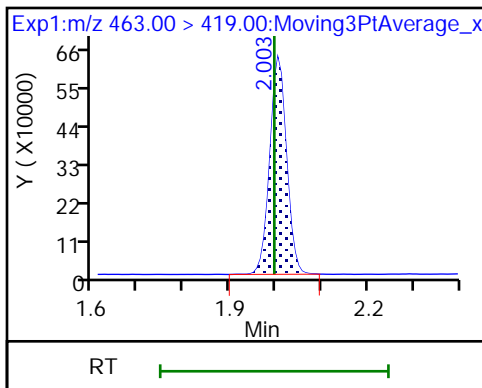
* 7 13C4 PFOS



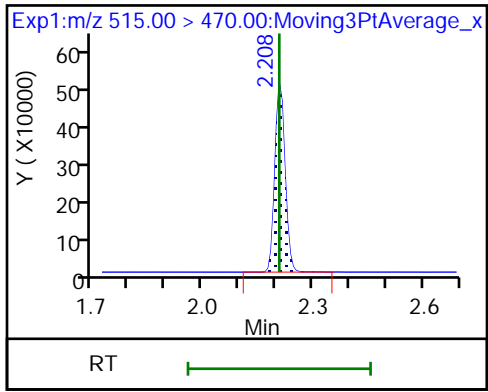
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_024.d
 Lims ID: LCS 320-237969/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 08-Aug-2018 04:45:39 ALS Bottle#: 13 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-237969/2-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.75	87.53
\$ 10 13C2 PFDA	10.0	9.40	94.00

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: WGNA-073118-RW-3785 MS Lab Sample ID: 320-41679-1 MS
 Matrix: Water Lab File ID: 2018.08.07_537C_026.d
 Analysis Method: 537 Date Collected: 07/31/2018 08:40
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 250.8(mL) Date Analyzed: 08/08/2018 04:55
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238610 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	146		40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	79.2		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	64.8		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	118		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	34.3		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	325		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	98		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_026.d
 Lims ID: 320-41679-A-1-B MS
 Client ID: WGNA-073118-RW-3785
 Sample Type: MS
 Inject. Date: 08-Aug-2018 04:55:01 ALS Bottle#: 15 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-1-b ms
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 13:44:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	10543306	81.5		5950	
298.90 > 99.00	1.350	1.350	0.0	1.000	7391046		1.43(0.00-0.00)	8568	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1400664	8.95		12430	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	5752218	29.5		2838	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.593	0.0	1.000	1317897	8.61		206	
* 6 13C2-PFOA									
415.00 > 370.00	1.760	1.760	0.0		1422947	10.0		7031	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.760	1.760	0.0	1.000	3095446	19.9		415	
413.00 > 169.00	1.760	1.760	0.0	1.000	1709563		1.81(0.00-0.00)	3454	
* 7 13C4 PFOS									
503.00 > 80.00	1.995	1.988	0.007		3131824	28.7		2610	
9 Perfluorononanoic acid									
463.00 > 419.00	2.003	1.995	0.008	1.000	1822800	16.3		143	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	1.995	2.018	-0.023	1.000	4375641	36.7		1905	
499.00 > 99.00	1.995	2.018	-0.023	1.000	897685		4.87(0.00-0.00)	1533	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.208	2.208	0.0	1.000	1137769	9.76		10002	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_026.d

Injection Date: 08-Aug-2018 04:55:01

Instrument ID: A8_N

Lims ID: 320-41679-A-1-B MS

Client ID: WGNA-073118-RW-3785

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 15

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

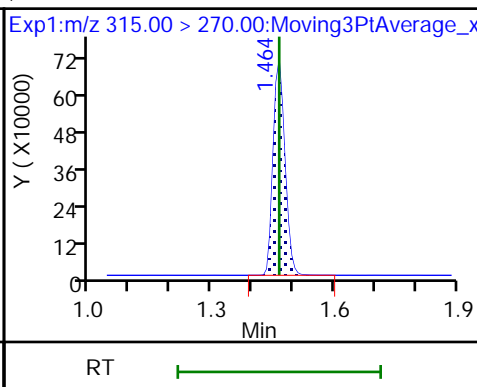
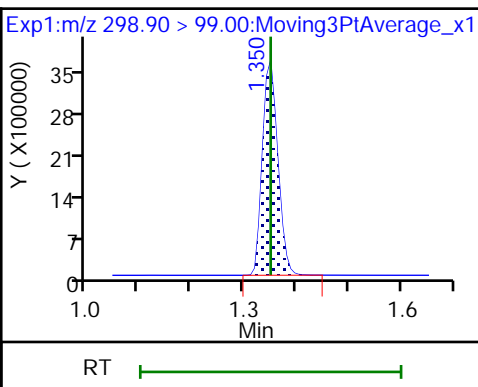
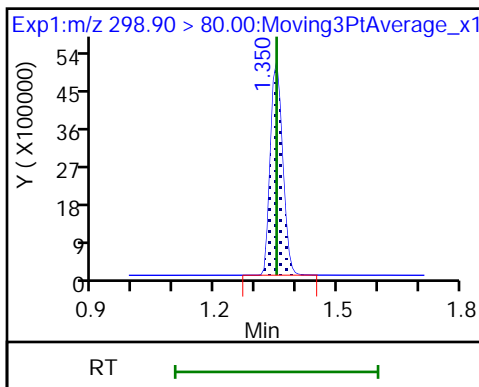
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

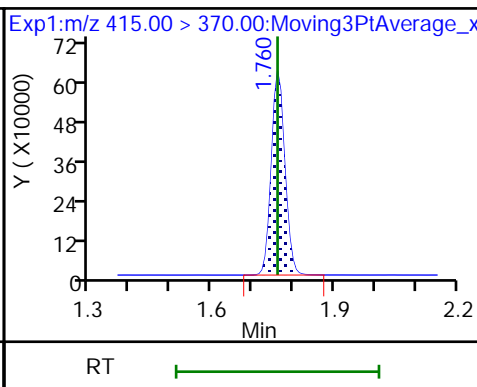
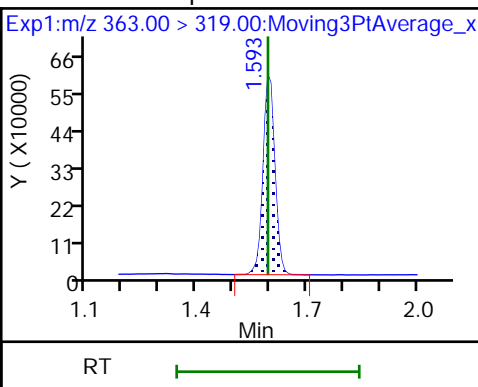
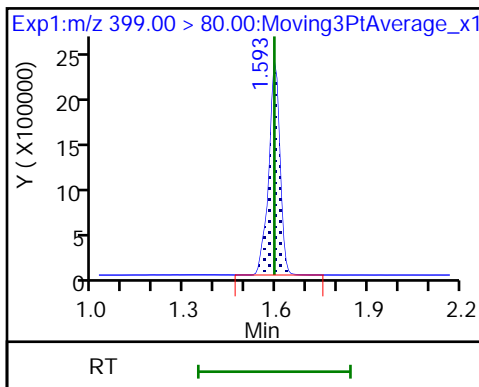
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

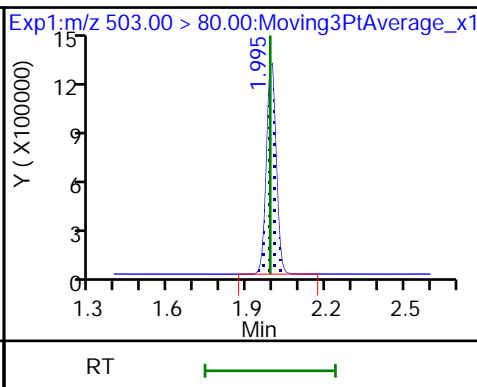
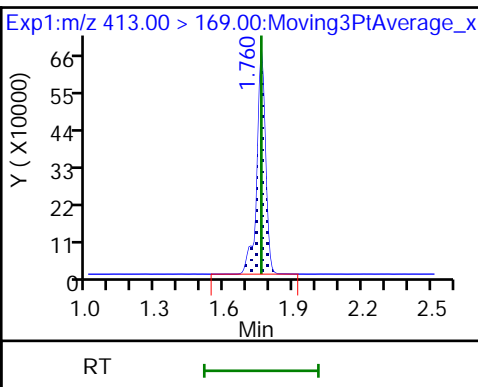
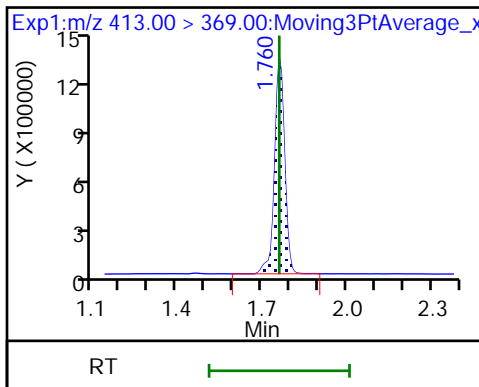
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

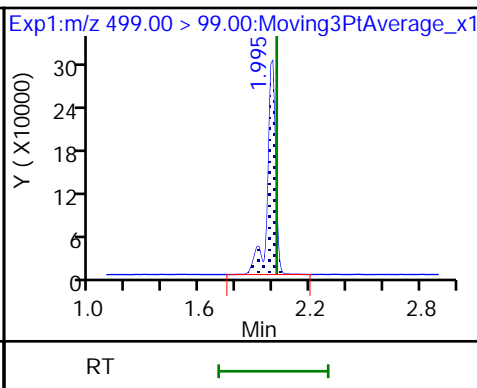
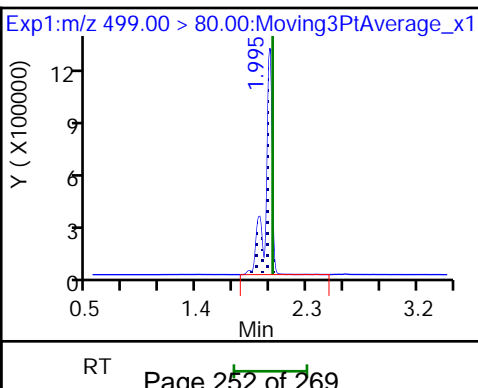
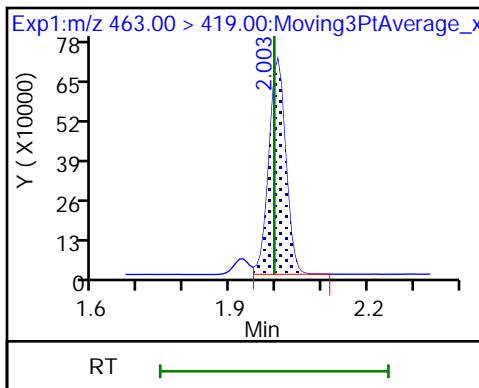
* 7 13C4 PFOS



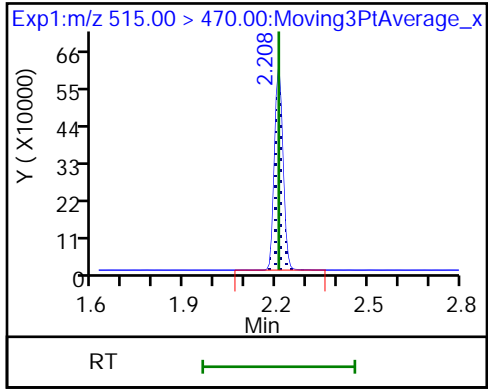
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_026.d
 Lims ID: 320-41679-A-1-B MS
 Client ID: WGNA-073118-RW-3785
 Sample Type: MS
 Inject. Date: 08-Aug-2018 04:55:01 ALS Bottle#: 15 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-1-b ms
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 13:44:37

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.95	89.52
\$ 10 13C2 PFDA	10.0	9.76	97.65

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: WGNA-073118-RW-3785 MSD Lab Sample ID: 320-41679-1 MSD
 Matrix: Water Lab File ID: 2018.08.07_537C_027.d
 Analysis Method: 537 Date Collected: 07/31/2018 08:40
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 243.5 (mL) Date Analyzed: 08/08/2018 04:59
 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.: 238610 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	151		41	16	7.0
335-67-1	Perfluorooctanoic acid (PFOA)	80.0		21	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	65.2		25	21	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	120		31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	35.1		10	4.1	2.0
375-73-5	Perfluorobutanesulfonic acid (PFBS)	335		92	37	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	86		70-130
STL00996	13C2 PFDA	99		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_027.d
 Lims ID: 320-41679-A-1-C MSD
 Client ID: WGNA-073118-RW-3785
 Sample Type: MSD
 Inject. Date: 08-Aug-2018 04:59:41 ALS Bottle#: 16 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-1-c msd
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 13:44:49

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	10183775	81.5		5875	
298.90 > 99.00	1.350	1.350	0.0	1.000	7032810		1.45(0.00-0.00)	7802	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1335663	8.61		11154	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	5509027	29.3		2769	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.593	0.0	1.000	1298045	8.56		204	
* 6 13C2-PFOA									
415.00 > 370.00	1.760	1.760	0.0		1410294	10.0		9769	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.760	1.760	0.0	1.000	3010558	19.5		390	
413.00 > 169.00	1.760	1.760	0.0	1.000	1685224		1.79(0.00-0.00)	3697	
* 7 13C4 PFOS									
503.00 > 80.00	1.988	1.988	0.0		3025296	28.7		2604	
9 Perfluorononanoic acid									
463.00 > 419.00	2.003	1.995	0.008	1.000	1765719	15.9		136	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	1.988	2.018	-0.030	1.000	4242044	36.8		1965	
499.00 > 99.00	1.988	2.018	-0.030	1.000	888278		4.78(0.00-0.00)	1445	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.208	2.208	0.0	1.000	1140508	9.88		9949	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_027.d

Injection Date: 08-Aug-2018 04:59:41

Instrument ID: A8_N

Lims ID: 320-41679-A-1-C MSD

Client ID: WGNA-073118-RW-3785

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 16

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

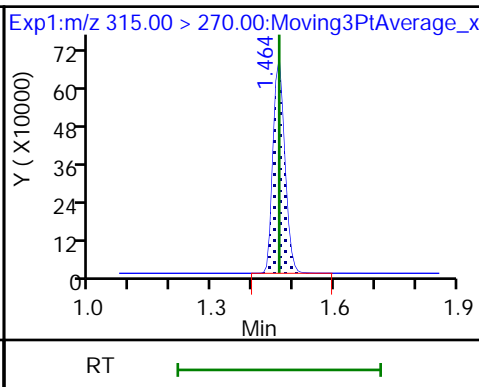
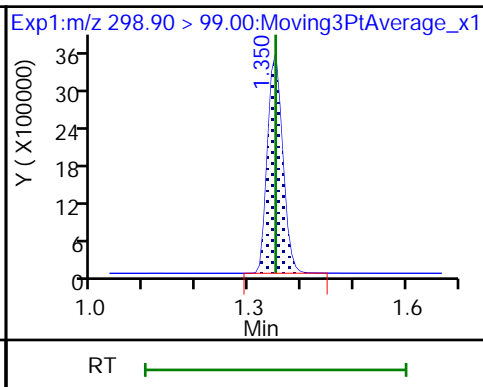
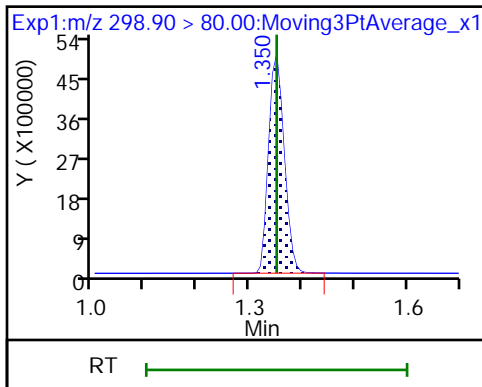
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

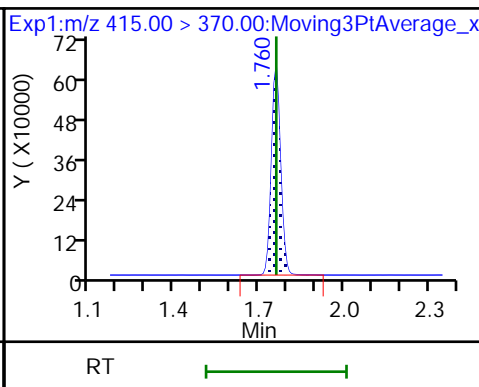
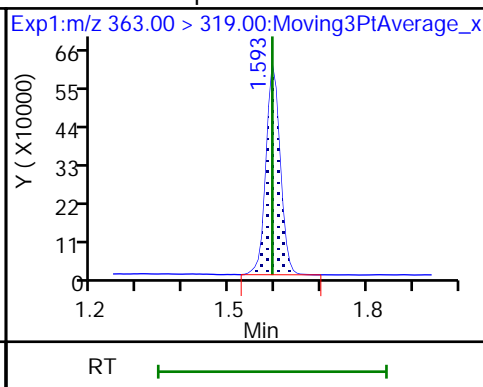
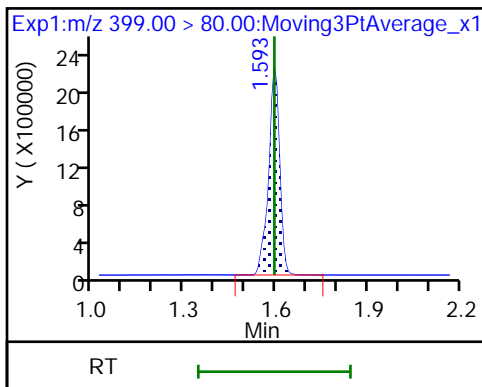
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

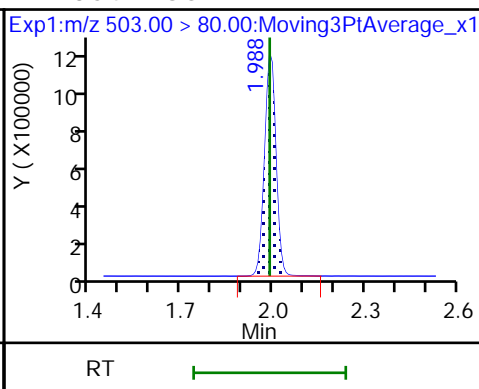
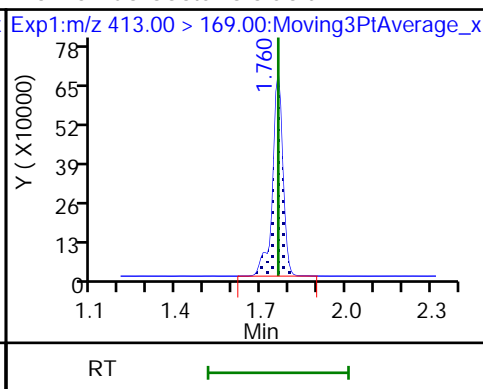
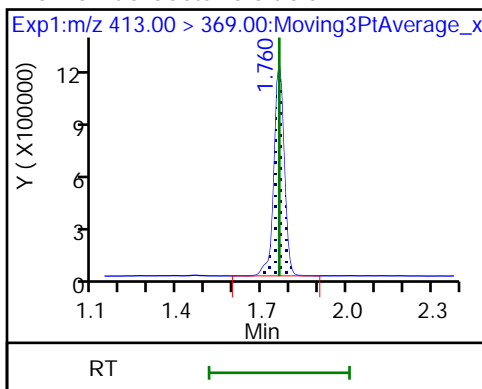
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

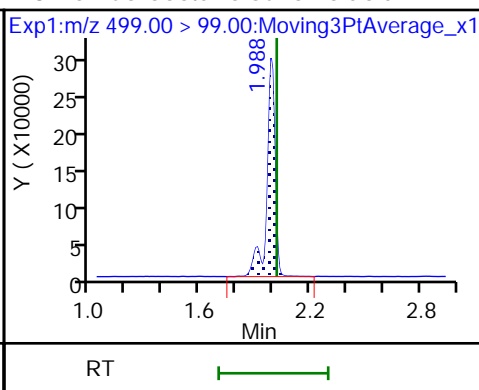
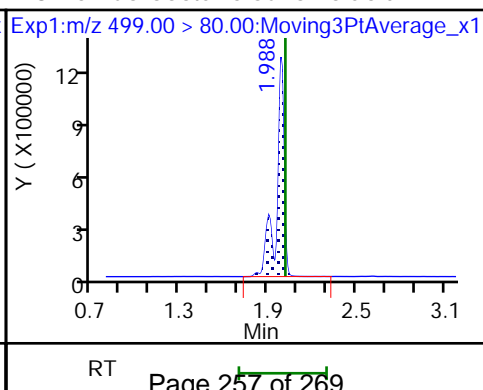
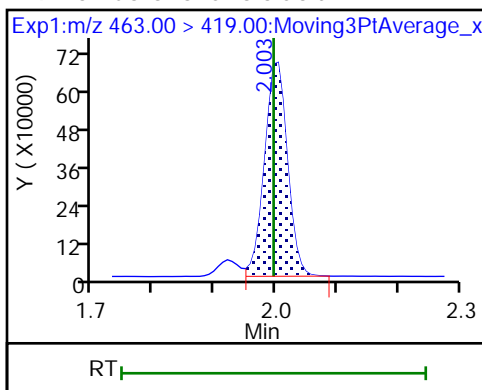
* 7 13C4 PFOS



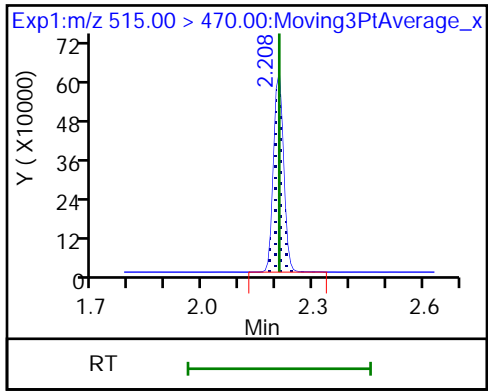
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_027.d
 Lims ID: 320-41679-A-1-C MSD
 Client ID: WGNA-073118-RW-3785
 Sample Type: MSD
 Inject. Date: 08-Aug-2018 04:59:41 ALS Bottle#: 16 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41679-a-1-c msd
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180807-62276.b\2018.08.07_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 13:44:49

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.61	86.13
\$ 10 13C2 PFDA	10.0	9.88	98.76

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/07/2018 12:44

Analysis Batch Number: 238469 End Date: 08/07/2018 13:26

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-238469/2		08/07/2018 12:44	1	2018.08.07_537C URVE 003.d	GeminiC18 3x100 3(mm)
IC 320-238469/3		08/07/2018 12:48	1	2018.08.07_537C URVE 004.d	GeminiC18 3x100 3(mm)
IC 320-238469/4		08/07/2018 12:53	1	2018.08.07_537C URVE 005.d	GeminiC18 3x100 3(mm)
IC 320-238469/5 ICISAV		08/07/2018 12:58	1	2018.08.07_537C URVE 006.d	GeminiC18 3x100 3(mm)
IC 320-238469/6		08/07/2018 13:02	1	2018.08.07_537C URVE 007.d	GeminiC18 3x100 3(mm)
IC 320-238469/7		08/07/2018 13:07	1	2018.08.07_537C URVE 008.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/07/2018 13:12	1		GeminiC18 3x100 3(mm)
CCVL 320-238469/9		08/07/2018 13:16	1	2018.08.07_537C URVE 010.d	GeminiC18 3x100 3(mm)
ICB 320-238469/10		08/07/2018 13:21	1		GeminiC18 3x100 3(mm)
ICV 320-238469/11		08/07/2018 13:26	1	2018.08.07_537C URVE 012.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/08/2018 04:31

Analysis Batch Number: 238610 End Date: 08/08/2018 05:27

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-238610/1 CCVIS		08/08/2018 04:31	1	2018.08.07_537C 021.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/08/2018 04:36	1		GeminiC18 3x100 3(mm)
MB 320-237969/1-A		08/08/2018 04:40	1	2018.08.07_537C 023.d	GeminiC18 3x100 3(mm)
LCS 320-237969/2-A		08/08/2018 04:45	1	2018.08.07_537C 024.d	GeminiC18 3x100 3(mm)
320-41679-1		08/08/2018 04:50	1	2018.08.07_537C 025.d	GeminiC18 3x100 3(mm)
320-41679-1 MS		08/08/2018 04:55	1	2018.08.07_537C 026.d	GeminiC18 3x100 3(mm)
320-41679-1 MSD		08/08/2018 04:59	1	2018.08.07_537C 027.d	GeminiC18 3x100 3(mm)
320-41679-2		08/08/2018 05:04	1	2018.08.07_537C 028.d	GeminiC18 3x100 3(mm)
320-41679-3		08/08/2018 05:09	1	2018.08.07_537C 029.d	GeminiC18 3x100 3(mm)
320-41679-4		08/08/2018 05:13	1	2018.08.07_537C 030.d	GeminiC18 3x100 3(mm)
320-41679-5		08/08/2018 05:18	1	2018.08.07_537C 031.d	GeminiC18 3x100 3(mm)
320-41679-6		08/08/2018 05:23	1	2018.08.07_537C 032.d	GeminiC18 3x100 3(mm)
CCV 320-238610/13 CCVIS		08/08/2018 05:27	1	2018.08.07_537C 033.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/08/2018 05:27

Analysis Batch Number: 238612 End Date: 08/08/2018 06:05

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-238612/13 CCVIS		08/08/2018 05:27	1	2018.08.07_537C 033.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/08/2018 05:32	1		GeminiC18 3x100 3(mm)
320-41679-7		08/08/2018 05:37	1	2018.08.07_537C 035.d	GeminiC18 3x100 3(mm)
320-41679-8		08/08/2018 05:41	1	2018.08.07_537C 036.d	GeminiC18 3x100 3(mm)
320-41679-9		08/08/2018 05:46	1	2018.08.07_537C 037.d	GeminiC18 3x100 3(mm)
320-41679-10		08/08/2018 05:51	1	2018.08.07_537C 038.d	GeminiC18 3x100 3(mm)
320-41679-11		08/08/2018 05:55	1	2018.08.07_537C 039.d	GeminiC18 3x100 3(mm)
320-41679-12		08/08/2018 06:00	1	2018.08.07_537C 040.d	GeminiC18 3x100 3(mm)
CCV 320-238612/21 CCVIS		08/08/2018 06:05	1	2018.08.07_537C 041.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/08/2018 03:07

Analysis Batch Number: 238776 End Date: 08/08/2018 03:44

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-238776/1		08/08/2018 03:07	1	2018.08.07_537C 003.d	GeminiC18 3x100 3(mm)
CCV 320-238776/9 CCVIS		08/08/2018 03:44	1		GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: _____

Batch Number: 237969 Batch Start Date: 08/04/18 08:23 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 08/06/18 16:10

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00077
MB 320-237969/1		537, 537				250 mL	1.00 mL	7 SU	100 uL
LCS 320-237969/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-41679-A-1	WGNA-073118-RW-3785	537, 537	T	268.98 g	28.72 g	240.3 mL	1.00 mL	7 SU	100 uL
320-41679-A-1	WGNA-073118-RW-3785	537, 537	T	280.33 g	29.49 g	250.8 mL	1.00 mL	7 SU	100 uL
320-41679-A-1	WGNA-073118-RW-3785	537, 537	T	272.17 g	28.72 g	243.5 mL	1.00 mL	7 SU	100 uL
320-41679-A-2	WGNA-073118-FRB-3785	537, 537	T	290.25 g	28.58 g	261.7 mL	1.00 mL	7 SU	100 uL
320-41679-A-3	NAWC-073118-RW-154	537, 537	T	283.01 g	28.71 g	254.3 mL	1.00 mL	7 SU	100 uL
320-41679-A-4	NAWC-073118-FRB-154	537, 537	T	286.19 g	28.51 g	257.7 mL	1.00 mL	7 SU	100 uL
320-41679-A-5	NAWC-073118-RW-185	537, 537	T	294.61 g	28.72 g	265.9 mL	1.00 mL	7 SU	100 uL
320-41679-A-6	NAWC-073118-FRB-185	537, 537	T	273.79 g	29.21 g	244.6 mL	1.00 mL	7 SU	100 uL
320-41679-A-7	NAWC-073118-RW-179	537, 537	T	287.71 g	29.85 g	257.9 mL	1.00 mL	7 SU	100 uL
320-41679-A-8	NAWC-073118-FRB-179	537, 537	T	283.90 g	31.05 g	252.9 mL	1.00 mL	7 SU	100 uL
320-41679-A-9	NAWC-073118-RW-124	537, 537	T	283.41 g	29.69 g	253.7 mL	1.00 mL	7 SU	100 uL
320-41679-A-10	NAWC-073118-FRB-124	537, 537	T	283.12 g	28.63 g	254.5 mL	1.00 mL	7 SU	100 uL
320-41679-A-11	WGNA-073118-RW-3103	537, 537	T	288.10 g	28.95 g	259.2 mL	1.00 mL	7 SU	100 uL
320-41679-A-12	WGNA-073118-FRB-3103	537, 537	T	289.49 g	28.81 g	260.7 mL	1.00 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-MSP 00033	LC537-SU 00074	AnalysisComment			
MB 320-237969/1		537, 537			100 uL	Chlorine, ND			
LCS 320-237969/2		537, 537		100 uL	100 uL	Chlorine, ND			
320-41679-A-1	WGNA-073118-RW-3785	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-1	WGNA-073118-RW-3785	537, 537	T	100 uL	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.: 320-41679-1

SDG No.: _____

Batch Number: 237969 Batch Start Date: 08/04/18 08:23 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 08/06/18 16:10

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-MSP 00033	LC537-SU 00074	AnalysisComment			
320-41679-A-1 MSD	WGNA-073118-RW-3 785	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41679-A-2	WGNA-073118-FRB- 3785	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-3	NAWC-073118-RW-1 54	537, 537	T		100 uL	Chlorine, ND. Yellow color after extraction			
320-41679-A-4	NAWC-073118-FRB- 154	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-5	NAWC-073118-RW-1 85	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-6	NAWC-073118-FRB- 185	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-7	NAWC-073118-RW-1 79	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-8	NAWC-073118-FRB- 179	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-9	NAWC-073118-RW-1 24	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-10	NAWC-073118-FRB- 124	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-11	WGNA-073118-RW-3 103	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-12	WGNA-073118-FRB- 3103	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.: 320-41679-1

SDG No.: _____

Batch Number: 237969 Batch Start Date: 08/04/18 08:23 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 08/06/18 16:10

Batch Notes	
Analyst ID - Aliquot Step	SKD
Batch Comment	Client labels match TA label, SKD 08/04/18
Analyst ID - Concentration	SKD
Analyst ID - Final Volume Step	SKD
Internal Standard ID#	1303558
Manifold ID	1, 3
Methanol ID	1319281
pH Indicator ID	0818
Pipette ID	R40536G, I46345G
Analyst ID - IS Reagent Drop	SKD
Analyst ID - IS Reagent Drop Witness	TWL
Analyst ID - SU Reagent Drop	SKD
Analyst ID - SU Reagent Drop Witness	VPM
Analyst ID - TA Reagent Drop	SKD
Analyst ID - TA Reagent Drop Witness	VPM
SPE Cartridge Lot ID	6390138-02
Trizma ID	SLBR5241V
Reagent Water ID	08/02/18

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.

Shipping and Receiving Documents



TestAmerica
 880 Riverside F
 West Sacramento
 phone 916.373.

Chain of Custody Record



THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.

Client Contact
 TetraTech
 234 Mall Boulevard Suite 260
 King of Prussia, PA 19406
 610-382-1174
 610-491-9688
 Project Name: WE04
 Site: WE04
 P O # 1132358 (through EarthToxics)

Project Manager: Andy Frebowitz
Tel/Fax: 610.382.1170

Lab Contact: Dave Alltucker
Carrier: FedEx

Site Contact: Mary Kay Bond
Other:

Lab Contact: Mary Kay Bond
Other:

Analysis Turnaround Time
 CALENDAR DAYS WORKING DAYS
 TAT if different from Below: 21
 2 weeks
 1 week
 2 days
 1 day

Sample Identification	Sample Date	Sample Time	Sample Type (G=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	EPA 537 UCMR3	Sample Specific Notes:
WGNA-073118-RW-3785	7/31/2018	8:40	G	DW	6	N	Y	Y	MS/MSD
WGNA-073118-FRB-3785	7/31/2018	8:35	G	DW	2	N	Y	Y	Field Reagent Blank
NAWC-073118-RW-154	7/31/2018	10:10	G	DW	2	N	Y	Y	Field Reagent Blank
NAWC-073118-FRB-154	7/31/2018	10:05	G	DW	2	N	Y	Y	Field Reagent Blank
NAWC-073118-RW-185	7/31/2018	11:10	G	DW	2	N	Y	Y	Field Reagent Blank
NAWC-073118-FRB-185	7/31/2018	11:05	G	DW	2	N	Y	Y	Field Reagent Blank
NAWC-073118-RW-179	7/31/2018	12:10	G	DW	2	N	Y	Y	Field Reagent Blank
NAWC-073118-FRB-179	7/31/2018	12:05	G	DW	2	N	Y	Y	Field Reagent Blank
NAWC-073118-RW-124	7/31/2018	12:40	G	DW	2	N	Y	Y	Field Reagent Blank
NAWC-073118-FRB-124	7/31/2018	12:35	G	DW	2	N	Y	Y	Field Reagent Blank
WGNA-073118-RW-3103	7/31/2018	13:40	G	DW	2	N	Y	Y	Field Reagent Blank
WGNA-073118-FRB-3103	7/31/2018	13:35	G	DW	2	N	Y	Y	Field Reagent Blank

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other: Trizma
Possible Hazard Identification:
 Non-Hazard Flammable Skin Irritant Poison B Unknown
 Return to Client Disposal by Lab Archive for _____ Months

Custody Seal No.: _____
 Company: Tetra Tech
 Date/Time: 7/31/2018 16:00
 Relinquished by: *Mary Kay Bond*
 Relinquished by: _____
 Date/Time: _____
 Relinquished by: _____
 Date/Time: _____

Custody Seals Intact: Yes No
 Relinquished by: *Mary Kay Bond*
 Relinquished by: _____
 Date/Time: _____
 Relinquished by: _____
 Date/Time: _____

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

Therm ID No.: 0-7
 Cooler Temp. (°C): 0-7
 Obs'd: 0-7
 Cor'd: 0-7
 Date/Time: 8/1/18 09:45
 Company: JIA-SAC
 Date/Time: _____
 Company: _____
 Date/Time: _____
 Company: _____

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-41679-1

Login Number: 41679
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	SEAL
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

"WGNA-073118-RW-3785","537","RES","320-41679-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","11","ng/L","J","7.1","DL","","TRG","","","42","LOQ","YES","-99","","240.3","1.00","17",""
"WGNA-073118-RW-3785","537","RES","320-41679-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","16","ng/L","J","2.9","DL","","TRG","","","21","LOQ","YES","-99","","240.3","1.00","8.3",""
"WGNA-073118-RW-3785","537","RES","320-41679-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","15","ng/L","J","5.7","DL","","TRG","","","31","LOQ","YES","-99","","240.3","1.00","12",""
"WGNA-073118-RW-3785","537","RES","320-41679-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","37","ng/L","U","17","DL","","TRG","","","94","LOQ","YES","-99","","240.3","1.00","37",""
"WGNA-073118-RW-3785","537","RES","320-41679-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","5.9","ng/L","J","2.0","DL","","TRG","","","10","LOQ","YES","-99","","240.3","1.00","4.2",""
"WGNA-073118-RW-3785","537","RES","320-41679-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","21","ng/L","U","8.3","DL","","TRG","","","25","LOQ","YES","-99","","240.3","1.00","21",""
"WGNA-073118-RW-3785","537","RES","320-41679-1","TALSAC","STL00993","13C2
PFHxA","37","ng/L","","-99","DL","","SURR","88","","-99","LOQ","YES","41.6","","240.3","1.00","0",""
"WGNA-073118-RW-3785","537","RES","320-41679-1","TALSAC","STL00996","13C2
PFDA","43","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","41.6","","240.3","1.00","0",""
"NAWC-073118-FRB-124","537","RES","320-41679-10","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.7","DL","","TRG","","","39","LOQ","YES","-99","","254.5","1.00","16",""
"NAWC-073118-FRB-124","537","RES","320-41679-10","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.9","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","254.5","1.00","7.9",""
"NAWC-073118-FRB-124","537","RES","320-41679-10","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.4","DL","","TRG","","","29","LOQ","YES","-99","","254.5","1.00","12",""
"NAWC-073118-FRB-124","537","RES","320-41679-10","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U","16","DL","","TRG","","","88","LOQ","YES","-99","","254.5","1.00","35",""
"NAWC-073118-FRB-124","537","RES","320-41679-10","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.9","ng/L","U","1.9","DL","","TRG","","","9.8","LOQ","YES","-99","","254.5","1.00","3.9",""
"NAWC-073118-FRB-124","537","RES","320-41679-10","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","7.9","DL","","TRG","","","24","LOQ","YES","-99","","254.5","1.00","20",""
"NAWC-073118-FRB-124","537","RES","320-41679-10","TALSAC","STL00993","13C2
PFHxA","34","ng/L","","-99","DL","","SURR","87","","-99","LOQ","YES","39.3","","254.5","1.00","0",""
"NAWC-073118-FRB-124","537","RES","320-41679-10","TALSAC","STL00996","13C2
PFDA","36","ng/L","","-99","DL","","SURR","91","","-99","LOQ","YES","39.3","","254.5","1.00","0",""
"WGNA-073118-RW-3103","537","RES","320-41679-11","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","7.1","ng/L","J","6.6","DL","","TRG","","","39","LOQ","YES","-99","","259.2","1.00","15",""
"WGNA-073118-RW-3103","537","RES","320-41679-11","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.3","ng/L","J","2.7","DL","","TRG","","","19","LOQ","YES","-99","","259.2","1.00","7.7",""
"WGNA-073118-RW-3103","537","RES","320-41679-11","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES","-99","","259.2","1.00","12",""
"WGNA-073118-RW-3103","537","RES","320-41679-11","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U M","16","DL","","TRG","","","87","LOQ","YES","-99","","259.2","1.00","35",""
"WGNA-073118-RW-3103","537","RES","320-41679-11","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","2.4","ng/L","J M","1.8","DL","","TRG","","","9.6","LOQ","YES","-99","","259.2","1.00","3.9",""
"WGNA-073118-RW-3103","537","RES","320-41679-11","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U","7.7","DL","","TRG","","","23","LOQ","YES","-99","","259.2","1.00","19",""
"WGNA-073118-RW-3103","537","RES","320-41679-11","TALSAC","STL00993","13C2
PFHxA","35","ng/L","","-99","DL","","SURR","90","","-99","LOQ","YES","38.6","","259.2","1.00","0",""
"WGNA-073118-RW-3103","537","RES","320-41679-11","TALSAC","STL00996","13C2
PFDA","38","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","38.6","","259.2","1.00","0",""
"WGNA-073118-FRB-3103","537","RES","320-41679-12","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","15","ng/L","U","6.5","DL","","TRG","","","38","LOQ","YES","-99","","260.7","1.00","15",""
"WGNA-073118-FRB-3103","537","RES","320-41679-12","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.7","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","260.7","1.00","7.7",""
"WGNA-073118-FRB-3103","537","RES","320-41679-12","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS),"12","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES",-99","","260.7","1.00","12","","
"WGNA-073118-FRB-3103","537","RES","320-41679-12","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"35","ng/L","U","15","DL","","TRG","","","86","LOQ","YES",-99","","260.7","1.00","35","","
"WGNA-073118-FRB-3103","537","RES","320-41679-12","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"3.8","ng/L","U","1.8","DL","","TRG","","","9.6","LOQ","YES",-99","","260.7","1.00","3.8","","
"WGNA-073118-FRB-3103","537","RES","320-41679-12","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"19","ng/L","U","7.7","DL","","TRG","","","23","LOQ","YES",-99","","260.7","1.00","19","","
"WGNA-073118-FRB-3103","537","RES","320-41679-12","TALSAC","STL00993","13C2
PFHxA,"33","ng/L","","-99","DL","","SURR","85","","-99","LOQ","YES","38.4","","260.7","1.00","0","","
"WGNA-073118-FRB-3103","537","RES","320-41679-12","TALSAC","STL00996","13C2
PFDA,"35","ng/L","","-99","DL","","SURR","92","","-99","LOQ","YES","38.4","","260.7","1.00","0","","
"WGNA-073118-RW-3785MS","537","RES","320-41679-1MS","TALSAC","1763-23-1","Perfluorooctanesulfonic
acid (PFOS),"146","ng/L","","6.8","DL","","SPK","103","","40","LOQ","YES","131","WGNA-073118-RW-
3785","250.8","1.00","16","","
"WGNA-073118-RW-3785MS","537","RES","320-41679-1MS","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"79.2","ng/L","","2.8","DL","","SPK","97","","20","LOQ","YES","65.8","WGNA-073118-RW-
3785","250.8","1.00","8.0","","
"WGNA-073118-RW-3785MS","537","RES","320-41679-1MS","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"118","ng/L","","5.5","DL","","SPK","103","","30","LOQ","YES","99.8","WGNA-073118-RW-
3785","250.8","1.00","12","","
"WGNA-073118-RW-3785MS","537","RES","320-41679-1MS","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"325","ng/L","","16","DL","","SPK","109","","90","LOQ","YES","299","WGNA-073118-RW-
3785","250.8","1.00","36","","
"WGNA-073118-RW-3785MS","537","RES","320-41679-1MS","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"34.3","ng/L","","1.9","DL","","SPK","89","","10","LOQ","YES","31.9","WGNA-073118-RW-
3785","250.8","1.00","4.0","","
"WGNA-073118-RW-3785MS","537","RES","320-41679-1MS","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"64.8","ng/L","","8.0","DL","","SPK","99","","24","LOQ","YES","65.8","WGNA-073118-RW-
3785","250.8","1.00","20","","
"WGNA-073118-RW-3785MS","537","RES","320-41679-1MS","TALSAC","STL00993","13C2
PFHxA,"35.7","ng/L","","-99","DL","","SURR","90","","-99","LOQ","YES","39.9","WGNA-073118-RW-
3785","250.8","1.00","0","","
"WGNA-073118-RW-3785MS","537","RES","320-41679-1MS","TALSAC","STL00996","13C2
PFDA,"38.9","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","39.9","WGNA-073118-RW-
3785","250.8","1.00","0","","
"WGNA-073118-RW-3785MSD","537","RES","320-41679-1MSD","TALSAC","1763-23-1","Perfluorooctanesulfonic
acid (PFOS),"151","ng/L","","7.0","DL","","SPK","104","3","41","LOQ","YES","135","WGNA-073118-RW-
3785","243.5","1.00","16","","
"WGNA-073118-RW-3785MSD","537","RES","320-41679-1MSD","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"80.0","ng/L","","2.9","DL","","SPK","95","1","21","LOQ","YES","67.8","WGNA-073118-RW-
3785","243.5","1.00","8.2","","
"WGNA-073118-RW-3785MSD","537","RES","320-41679-1MSD","TALSAC","355-46-4","Perfluorohexanesulfonic
acid (PFHxS),"120","ng/L","","5.6","DL","","SPK","103","2","31","LOQ","YES","103","WGNA-073118-RW-
3785","243.5","1.00","12","","
"WGNA-073118-RW-3785MSD","537","RES","320-41679-1MSD","TALSAC","375-73-5","Perfluorobutanesulfonic
acid (PFBS),"335","ng/L","","17","DL","","SPK","109","3","92","LOQ","YES","308","WGNA-073118-RW-
3785","243.5","1.00","37","","
"WGNA-073118-RW-3785MSD","537","RES","320-41679-1MSD","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"35.1","ng/L","","2.0","DL","","SPK","89","2","10","LOQ","YES","32.9","WGNA-073118-RW-
3785","243.5","1.00","4.1","","
"WGNA-073118-RW-3785MSD","537","RES","320-41679-1MSD","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"65.2","ng/L","","8.2","DL","","SPK","96","1","25","LOQ","YES","67.8","WGNA-073118-RW-
3785","243.5","1.00","21","","
"WGNA-073118-RW-3785MSD","537","RES","320-41679-1MSD","TALSAC","STL00993","13C2

PFHxA", "35.4", "ng/L", "", "-99", "DL", "", "SURR", "86", "", "-99", "LOQ", "YES", "41.1", "WGNA-073118-RW-3785", "243.5", "1.00", "0", ""
"WGNA-073118-RW-3785MSD", "537", "RES", "320-41679-1MSD", "TALSAC", "STL00996", "13C2
PFDA", "40.6", "ng/L", "", "-99", "DL", "", "SURR", "99", "", "-99", "LOQ", "YES", "41.1", "WGNA-073118-RW-3785", "243.5", "1.00", "0", ""
"WGNA-073118-FRB-3785", "537", "RES", "320-41679-2", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "15", "ng/L", "U", "6.5", "DL", "", "TRG", "", "", "38", "LOQ", "YES", "-99", "", "261.7", "1.00", "15", ""
"WGNA-073118-FRB-3785", "537", "RES", "320-41679-2", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "7.6", "ng/L", "U", "2.7", "DL", "", "TRG", "", "", "19", "LOQ", "YES", "-99", "", "261.7", "1.00", "7.6", ""
"WGNA-073118-FRB-3785", "537", "RES", "320-41679-2", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "11", "ng/L", "U", "5.3", "DL", "", "TRG", "", "", "29", "LOQ", "YES", "-99", "", "261.7", "1.00", "11", ""
"WGNA-073118-FRB-3785", "537", "RES", "320-41679-2", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "34", "ng/L", "U", "15", "DL", "", "TRG", "", "", "86", "LOQ", "YES", "-99", "", "261.7", "1.00", "34", ""
"WGNA-073118-FRB-3785", "537", "RES", "320-41679-2", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "3.8", "ng/L", "U", "1.8", "DL", "", "TRG", "", "", "9.6", "LOQ", "YES", "-99", "", "261.7", "1.00", "3.8", ""
"WGNA-073118-FRB-3785", "537", "RES", "320-41679-2", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "19", "ng/L", "U", "7.6", "DL", "", "TRG", "", "", "23", "LOQ", "YES", "-99", "", "261.7", "1.00", "19", ""
"WGNA-073118-FRB-3785", "537", "RES", "320-41679-2", "TALSAC", "STL00993", "13C2
PFHxA", "33", "ng/L", "", "-99", "DL", "", "SURR", "86", "", "-99", "LOQ", "YES", "38.2", "", "261.7", "1.00", "0", ""
"WGNA-073118-FRB-3785", "537", "RES", "320-41679-2", "TALSAC", "STL00996", "13C2
PFDA", "37", "ng/L", "", "-99", "DL", "", "SURR", "97", "", "-99", "LOQ", "YES", "38.2", "", "261.7", "1.00", "0", ""
"NAWC-073118-RW-154", "537", "RES", "320-41679-3", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "17", "ng/L", "J", "6.7", "DL", "", "TRG", "", "", "39", "LOQ", "YES", "-99", "", "254.3", "1.00", "16", ""
"NAWC-073118-RW-154", "537", "RES", "320-41679-3", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "24", "ng/L", "", "2.8", "DL", "", "TRG", "", "", "20", "LOQ", "YES", "-99", "", "254.3", "1.00", "7.9", ""
"NAWC-073118-RW-154", "537", "RES", "320-41679-3", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "12", "ng/L", "U", "5.4", "DL", "", "TRG", "", "", "29", "LOQ", "YES", "-99", "", "254.3", "1.00", "12", ""
"NAWC-073118-RW-154", "537", "RES", "320-41679-3", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "35", "ng/L", "U", "16", "DL", "", "TRG", "", "", "88", "LOQ", "YES", "-99", "", "254.3", "1.00", "35", ""
"NAWC-073118-RW-154", "537", "RES", "320-41679-3", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "8.9", "ng/L", "J", "1.9", "DL", "", "TRG", "", "", "9.8", "LOQ", "YES", "-99", "", "254.3", "1.00", "3.9", ""
"NAWC-073118-RW-154", "537", "RES", "320-41679-3", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "20", "ng/L", "U", "7.9", "DL", "", "TRG", "", "", "24", "LOQ", "YES", "-99", "", "254.3", "1.00", "20", ""
"NAWC-073118-RW-154", "537", "RES", "320-41679-3", "TALSAC", "STL00993", "13C2
PFHxA", "32", "ng/L", "", "-99", "DL", "", "SURR", "80", "", "-99", "LOQ", "YES", "39.3", "", "254.3", "1.00", "0", ""
"NAWC-073118-RW-154", "537", "RES", "320-41679-3", "TALSAC", "STL00996", "13C2
PFDA", "37", "ng/L", "", "-99", "DL", "", "SURR", "94", "", "-99", "LOQ", "YES", "39.3", "", "254.3", "1.00", "0", ""
"NAWC-073118-FRB-154", "537", "RES", "320-41679-4", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "16", "ng/L", "U", "6.6", "DL", "", "TRG", "", "", "39", "LOQ", "YES", "-99", "", "257.7", "1.00", "16", ""
"NAWC-073118-FRB-154", "537", "RES", "320-41679-4", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "7.8", "ng/L", "U", "2.7", "DL", "", "TRG", "", "", "19", "LOQ", "YES", "-99", "", "257.7", "1.00", "7.8", ""
"NAWC-073118-FRB-154", "537", "RES", "320-41679-4", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "12", "ng/L", "U", "5.3", "DL", "", "TRG", "", "", "29", "LOQ", "YES", "-99", "", "257.7", "1.00", "12", ""
"NAWC-073118-FRB-154", "537", "RES", "320-41679-4", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "35", "ng/L", "U", "16", "DL", "", "TRG", "", "", "87", "LOQ", "YES", "-99", "", "257.7", "1.00", "35", ""
"NAWC-073118-FRB-154", "537", "RES", "320-41679-4", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "3.9", "ng/L", "U", "1.8", "DL", "", "TRG", "", "", "9.7", "LOQ", "YES", "-99", "", "257.7", "1.00", "3.9", ""
"NAWC-073118-FRB-154", "537", "RES", "320-41679-4", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "19", "ng/L", "U", "7.8", "DL", "", "TRG", "", "", "23", "LOQ", "YES", "-99", "", "257.7", "1.00", "19", ""
"NAWC-073118-FRB-154", "537", "RES", "320-41679-4", "TALSAC", "STL00993", "13C2
PFHxA", "33", "ng/L", "", "-99", "DL", "", "SURR", "86", "", "-99", "LOQ", "YES", "38.8", "", "257.7", "1.00", "0", ""
"NAWC-073118-FRB-154", "537", "RES", "320-41679-4", "TALSAC", "STL00996", "13C2
PFDA", "38", "ng/L", "", "-99", "DL", "", "SURR", "98", "", "-99", "LOQ", "YES", "38.8", "", "257.7", "1.00", "0", ""
"NAWC-073118-RW-185", "537", "RES", "320-41679-5", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid

(PFOS),"15","ng/L","J","6.4","DL","","TRG","","","38","LOQ","YES",-99,"","265.9","1.00","15",""
"NAWC-073118-RW-185","537","RES","320-41679-5","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"12","ng/L","J","2.6","DL","","TRG","","","19","LOQ","YES",-99,"","265.9","1.00","7.5",""
"NAWC-073118-RW-185","537","RES","320-41679-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"8.5","ng/L","J","5.2","DL","","TRG","","","28","LOQ","YES",-99,"","265.9","1.00","11",""
"NAWC-073118-RW-185","537","RES","320-41679-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"34","ng/L","U","15","DL","","TRG","","","85","LOQ","YES",-99,"","265.9","1.00","34",""
"NAWC-073118-RW-185","537","RES","320-41679-5","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"8.2","ng/L","J","1.8","DL","","TRG","","","9.4","LOQ","YES",-99,"","265.9","1.00","3.8",""
"NAWC-073118-RW-185","537","RES","320-41679-5","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"19","ng/L","U","7.5","DL","","TRG","","","23","LOQ","YES",-99,"","265.9","1.00","19",""
"NAWC-073118-RW-185","537","RES","320-41679-5","TALSAC","STL00993","13C2
PFHxA","31","ng/L","","-99","DL","","SURR","81","","-99","LOQ","YES","37.6","","265.9","1.00","0",""
"NAWC-073118-RW-185","537","RES","320-41679-5","TALSAC","STL00996","13C2
PFDA","35","ng/L","","-99","DL","","SURR","94","","-99","LOQ","YES","37.6","","265.9","1.00","0",""
"NAWC-073118-FRB-185","537","RES","320-41679-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"16","ng/L","U","7.0","DL","","TRG","","","41","LOQ","YES",-99,"","244.6","1.00","16",""
"NAWC-073118-FRB-185","537","RES","320-41679-6","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"8.2","ng/L","U","2.9","DL","","TRG","","","20","LOQ","YES",-99,"","244.6","1.00","8.2",""
"NAWC-073118-FRB-185","537","RES","320-41679-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"12","ng/L","U","5.6","DL","","TRG","","","31","LOQ","YES",-99,"","244.6","1.00","12",""
"NAWC-073118-FRB-185","537","RES","320-41679-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"37","ng/L","U","16","DL","","TRG","","","92","LOQ","YES",-99,"","244.6","1.00","37",""
"NAWC-073118-FRB-185","537","RES","320-41679-6","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"4.1","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES",-99,"","244.6","1.00","4.1",""
"NAWC-073118-FRB-185","537","RES","320-41679-6","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"20","ng/L","U","8.2","DL","","TRG","","","25","LOQ","YES",-99,"","244.6","1.00","20",""
"NAWC-073118-FRB-185","537","RES","320-41679-6","TALSAC","STL00993","13C2
PFHxA","40","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","40.9","","244.6","1.00","0",""
"NAWC-073118-FRB-185","537","RES","320-41679-6","TALSAC","STL00996","13C2
PFDA","42","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","40.9","","244.6","1.00","0",""
"NAWC-073118-RW-179","537","RES","320-41679-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"17","ng/L","J","6.6","DL","","TRG","","","39","LOQ","YES",-99,"","257.9","1.00","16",""
"NAWC-073118-RW-179","537","RES","320-41679-7","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"21","ng/L","","2.7","DL","","TRG","","","19","LOQ","YES",-99,"","257.9","1.00","7.8",""
"NAWC-073118-RW-179","537","RES","320-41679-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"7.1","ng/L","J","5.3","DL","","TRG","","","29","LOQ","YES",-99,"","257.9","1.00","12",""
"NAWC-073118-RW-179","537","RES","320-41679-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"35","ng/L","U","16","DL","","TRG","","","87","LOQ","YES",-99,"","257.9","1.00","35",""
"NAWC-073118-RW-179","537","RES","320-41679-7","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"6.0","ng/L","J","1.8","DL","","TRG","","","9.7","LOQ","YES",-99,"","257.9","1.00","3.9",""
"NAWC-073118-RW-179","537","RES","320-41679-7","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"19","ng/L","U","7.8","DL","","TRG","","","23","LOQ","YES",-99,"","257.9","1.00","19",""
"NAWC-073118-RW-179","537","RES","320-41679-7","TALSAC","STL00993","13C2
PFHxA","34","ng/L","","-99","DL","","SURR","87","","-99","LOQ","YES","38.8","","257.9","1.00","0",""
"NAWC-073118-RW-179","537","RES","320-41679-7","TALSAC","STL00996","13C2
PFDA","39","ng/L","","-99","DL","","SURR","101","","-99","LOQ","YES","38.8","","257.9","1.00","0",""
"NAWC-073118-FRB-179","537","RES","320-41679-8","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"16","ng/L","U","6.7","DL","","TRG","","","40","LOQ","YES",-99,"","252.9","1.00","16",""
"NAWC-073118-FRB-179","537","RES","320-41679-8","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"7.9","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES",-99,"","252.9","1.00","7.9",""
"NAWC-073118-FRB-179","537","RES","320-41679-8","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"12","ng/L","U","5.4","DL","","TRG","","","30","LOQ","YES",-99,"","252.9","1.00","12",""
"NAWC-073118-FRB-179","537","RES","320-41679-8","TALSAC","375-73-5","Perfluorobutanesulfonic acid

(PFBS)", "36", "ng/L", "U", "16", "DL", "", "TRG", "", "", "89", "LOQ", "YES", "-99", "", "252.9", "1.00", "36", ""
"NAWC-073118-FRB-179", "537", "RES", "320-41679-8", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)", "4.0", "ng/L", "U", "1.9", "DL", "", "TRG", "", "", "9.9", "LOQ", "YES", "-99", "", "252.9", "1.00", "4.0", ""
"NAWC-073118-FRB-179", "537", "RES", "320-41679-8", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)", "20", "ng/L", "U", "7.9", "DL", "", "TRG", "", "", "24", "LOQ", "YES", "-99", "", "252.9", "1.00", "20", ""
"NAWC-073118-FRB-179", "537", "RES", "320-41679-8", "TALSAC", "STL00993", "13C2
PFHxA", "34", "ng/L", "", "-99", "DL", "", "SURR", "87", "", "-99", "LOQ", "YES", "39.5", "", "252.9", "1.00", "0", ""
"NAWC-073118-FRB-179", "537", "RES", "320-41679-8", "TALSAC", "STL00996", "13C2
PFDA", "40", "ng/L", "", "-99", "DL", "", "SURR", "101", "", "-99", "LOQ", "YES", "39.5", "", "252.9", "1.00", "0", ""
"NAWC-073118-RW-124", "537", "RES", "320-41679-9", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
(PFOS)", "31", "ng/L", "J", "6.7", "DL", "", "TRG", "", "", "39", "LOQ", "YES", "-99", "", "253.7", "1.00", "16", ""
"NAWC-073118-RW-124", "537", "RES", "320-41679-9", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)", "20", "ng/L", "", "2.8", "DL", "", "TRG", "", "", "20", "LOQ", "YES", "-99", "", "253.7", "1.00", "7.9", ""
"NAWC-073118-RW-124", "537", "RES", "320-41679-9", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid
(PFHxS)", "14", "ng/L", "J", "5.4", "DL", "", "TRG", "", "", "30", "LOQ", "YES", "-99", "", "253.7", "1.00", "12", ""
"NAWC-073118-RW-124", "537", "RES", "320-41679-9", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)", "35", "ng/L", "U", "16", "DL", "", "TRG", "", "", "89", "LOQ", "YES", "-99", "", "253.7", "1.00", "35", ""
"NAWC-073118-RW-124", "537", "RES", "320-41679-9", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)", "4.7", "ng/L", "J", "1.9", "DL", "", "TRG", "", "", "9.9", "LOQ", "YES", "-99", "", "253.7", "1.00", "3.9", ""
"NAWC-073118-RW-124", "537", "RES", "320-41679-9", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)", "20", "ng/L", "U", "7.9", "DL", "", "TRG", "", "", "24", "LOQ", "YES", "-99", "", "253.7", "1.00", "20", ""
"NAWC-073118-RW-124", "537", "RES", "320-41679-9", "TALSAC", "STL00993", "13C2
PFHxA", "33", "ng/L", "", "-99", "DL", "", "SURR", "83", "", "-99", "LOQ", "YES", "39.4", "", "253.7", "1.00", "0", ""
"NAWC-073118-RW-124", "537", "RES", "320-41679-9", "TALSAC", "STL00996", "13C2
PFDA", "37", "ng/L", "", "-99", "DL", "", "SURR", "94", "", "-99", "LOQ", "YES", "39.4", "", "253.7", "1.00", "0", ""
"LCS 320-237969/2-A", "537", "RES", "LCS 320-237969/2-A", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
(PFOS)", "138", "ng/L", "", "6.8", "DL", "", "SPK", "104", "", "40", "LOQ", "YES", "132", "", "250", "1.00", "16", ""
"LCS 320-237969/2-A", "537", "RES", "LCS 320-237969/2-A", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)", "68.3", "ng/L", "", "2.8", "DL", "", "SPK", "103", "", "20", "LOQ", "YES", "66.0", "", "250", "1.00", "8.0", ""
"LCS 320-237969/2-A", "537", "RES", "LCS 320-237969/2-A", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid
(PFHxS)", "107", "ng/L", "", "5.5", "DL", "", "SPK", "107", "", "30", "LOQ", "YES", "100", "", "250", "1.00", "12", ""
"LCS 320-237969/2-A", "537", "RES", "LCS 320-237969/2-A", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)", "321", "ng/L", "", "16", "DL", "", "SPK", "107", "", "90", "LOQ", "YES", "300", "", "250", "1.00", "36", ""
"LCS 320-237969/2-A", "537", "RES", "LCS 320-237969/2-A", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)", "32.1", "ng/L", "", "1.9", "DL", "", "SPK", "100", "", "10", "LOQ", "YES", "32.0", "", "250", "1.00", "4.0", ""
"LCS 320-237969/2-A", "537", "RES", "LCS 320-237969/2-A", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)", "64.4", "ng/L", "", "8.0", "DL", "", "SPK", "98", "", "24", "LOQ", "YES", "66.0", "", "250", "1.00", "20", ""
"LCS 320-237969/2-A", "537", "RES", "LCS 320-237969/2-A", "TALSAC", "STL00993", "13C2
PFHxA", "35.0", "ng/L", "", "-99", "DL", "", "SURR", "88", "", "-99", "LOQ", "YES", "40.0", "", "250", "1.00", "0", ""
"LCS 320-237969/2-A", "537", "RES", "LCS 320-237969/2-A", "TALSAC", "STL00996", "13C2
PFDA", "37.6", "ng/L", "", "-99", "DL", "", "SURR", "94", "", "-99", "LOQ", "YES", "40.0", "", "250", "1.00", "0", ""
"MB 320-237969/1-A", "537", "RES", "MB 320-237969/1-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 320-237969/1-A", "537", "RES", "MB 320-237969/1-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 320-237969/1-A", "537", "RES", "MB 320-237969/1-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 320-237969/1-A", "537", "RES", "MB 320-237969/1-A", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)", "36", "ng/L", "U", "16", "DL", "", "TRG", "", "", "90", "LOQ", "YES", "-99", "", "250", "1.00", "36", ""
"MB 320-237969/1-A", "537", "RES", "MB 320-237969/1-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 320-237969/1-A", "537", "RES", "MB 320-237969/1-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 320-237969/1-A", "537", "RES", "MB 320-237969/1-A", "TALSAC", "STL00993", "13C2

PFHxA","36.1","ng/L","",-99","DL","","SURR","90","",-99","LOQ","YES","40.0","","250","1.00","0",""
"MB 320-237969/1-A","537","RES","MB 320-237969/1-A","TALSAC","STL00996","13C2
PFDA","37.8","ng/L","",-99","DL","","SURR","95","",-99","LOQ","YES","40.0","","250","1.00","0",""
"Unknown","Unknown","WGNA-073118-RW-3785","07/31/2018 08:40","AQ","320-41679-
1","NM","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018
04:50","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-
238610","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""
"Unknown","Unknown","NAWC-073118-FRB-124","07/31/2018 12:35","AQ","320-41679-
10","FB","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018
05:51","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-
238612","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""
"Unknown","Unknown","WGNA-073118-RW-3103","07/31/2018 13:40","AQ","320-41679-
11","NM","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018
05:55","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-
238612","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""
"Unknown","Unknown","WGNA-073118-FRB-3103","07/31/2018 13:35","AQ","320-41679-
12","FB","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018
06:00","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-
238612","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""
"Unknown","Unknown","WGNA-073118-RW-3785MS","07/31/2018 08:40","AQ","320-41679-
1MS","MS","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018
04:55","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-
238610","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""
"Unknown","Unknown","WGNA-073118-RW-3785MSD","07/31/2018 08:40","AQ","320-41679-
1MSD","MSD","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018
04:59","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-
238610","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""
"Unknown","Unknown","WGNA-073118-FRB-3785","07/31/2018 08:35","AQ","320-41679-
2","FB","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018
05:04","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-
238610","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""
"Unknown","Unknown","NAWC-073118-RW-154","07/31/2018 10:10","AQ","320-41679-
3","NM","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018
05:09","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-
238610","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""
"Unknown","Unknown","NAWC-073118-FRB-154","07/31/2018 10:05","AQ","320-41679-
4","FB","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018
05:13","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-
238610","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""
"Unknown","Unknown","NAWC-073118-RW-185","07/31/2018 11:10","AQ","320-41679-
5","NM","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018
05:18","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-
238610","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""
"Unknown","Unknown","NAWC-073118-FRB-185","07/31/2018 11:05","AQ","320-41679-
6","FB","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018
05:23","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-
238610","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""
"Unknown","Unknown","NAWC-073118-RW-179","07/31/2018 12:10","AQ","320-41679-
7","NM","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018
05:37","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-
238612","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""
"Unknown","Unknown","NAWC-073118-FRB-179","07/31/2018 12:05","AQ","320-41679-
8","FB","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018
05:41","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-

238612","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""
"Unknown","Unknown","NAWC-073118-RW-124","07/31/2018 12:40","AQ","320-41679-
9","NM","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018
05:46","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-
238612","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""
"Unknown","Unknown","LCS 320-237969/2-A","","AQ","LCS 320-237969/2-
A","LCS","","-99","537","METHOD","RES","08/04/2018 08:24","08/08/2018
04:45","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-
238610","320-41679-1","08/04/2018 08:24","08/03/2018 13:05",""
"Unknown","Unknown","MB 320-237969/1-A","","AQ","MB 320-237969/1-
A","MB","","-99","537","METHOD","RES","08/04/2018 08:24","08/08/2018
04:40","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-
238610","320-41679-1","08/04/2018 08:24","08/03/2018 13:05",""

TO: A. FREBOWITZ
SDG: 320-41679-1

PAGE 2

NAWC-073118-RW-154
NAWC-073118-RW-179
NAWC-073118-RW-185
WGNA-073118-RW-3103
WGNA-073118-RW-3785

NAWC-073118-FRB-154
NAWC-073118-FRB-179
NAWC-073118-FRB-185
WGNA-073118-FRB-3103
WGNA-073118-FRB-3785

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: None.

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), US EPA National Functional Guidelines for Organic Data Review (January 2017), and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (July 2013) as applicable. The text of this report has been formulated to address only those areas affecting data quality.



Tetra Tech, Inc.
Terri L. Solomon
Chemist/Data Validator



Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:

Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.
J	The result is an estimated quantity. 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.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.
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.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

Appendix A

Qualified Analytical Results

Qualifier Codes:

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
- C01 = GC/MS Tuning Noncompliance
- D = MS/MSD Recovery Noncompliance
- E = LCS/LCSD Recovery Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
- K = ICP Interference - includes ICS % R Noncompliance
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation Noncompliance
- N = Internal Standard Noncompliance
- N01 = Internal Standard Recovery Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $<$ CRQL for organics)
- Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = RPD between columns/detectors $>40\%$ for positive results determined via GC/HPLC
- V = Non-linear calibrations; correlation coefficient $r < 0.995$
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids $<30\%$
- Z = Uncertainty at 2 standard deviations is greater than sample activity
- Z1 = Tentatively Identified Compound considered presumptively present
- Z2 = Tentatively Identified Compound column bleed
- Z3 = Tentatively Identified Compound aldol condensate
- Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
- Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04 SDG: 320-41679-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	NAWC-073118-FRB-124			NAWC-073118-FRB-154			NAWC-073118-FRB-179			NAWC-073118-FRB-185		
	LAB_ID	320-41679-10			320-41679-4			320-41679-8			320-41679-6		
	SAMP_DATE	7/31/2018			7/31/2018			7/31/2018			7/31/2018		
	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 (PFOA)	7.9	U		7.8	U		7.9	U		8.2	U		
PERFLUOROBUTANESULFONIC ACID (PFBS)	35	U		35	U		36	U		37	U		
PERFLUOROHEPTANOIC ACID (PFHPA)	3.9	U		3.9	U		4	U		4.1	U		
PERFLUOROHEXANESULFONIC ACID (PFHXS)	12	U		12	U		12	U		12	U		
PERFLUORONONANOIC ACID (PFNA)	20	U		19	U		20	U		20	U		
PERFLUOROOCTANESULFONIC ACID (PFOS)	16	U		16	U		16	U		16	U		

PROJ_NO: 08005-WE04 SDG: 320-41679-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	NAWC-073118-RW-124			NAWC-073118-RW-154			NAWC-073118-RW-179			NAWC-073118-RW-185		
	LAB_ID	320-41679-9			320-41679-3			320-41679-7			320-41679-5		
	SAMP_DATE	7/31/2018			7/31/2018			7/31/2018			7/31/2018		
	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 (PFOA)	20			24			21			12	J	P	
PERFLUOROBUTANESULFONIC ACID (PFBS)	35	U		35	U		35	U		34	U		
PERFLUOROHEPTANOIC ACID (PFHPA)	4.7	J	P	8.9	J	P	6	J	P	8.2	J	P	
PERFLUOROHEXANESULFONIC ACID (PFHXS)	14	J	P	12	U		7.1	J	P	8.5	J	P	
PERFLUORONONANOIC ACID (PFNA)	20	U		20	U		19	U		19	U		
PERFLUOROOCTANESULFONIC ACID (PFOS)	31	J	P	17	J	P	17	J	P	15	J	P	

PROJ_NO: 08005-WE04 SDG: 320-41679-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	WGNA-073118-FRB-3103			WGNA-073118-FRB-3785			WGNA-073118-RW-3103			WGNA-073118-RW-3785		
	LAB_ID	320-41679-12			320-41679-2			320-41679-11			320-41679-1		
	SAMP_DATE	7/31/2018			7/31/2018			7/31/2018			7/31/2018		
	QC_TYPE	FB			FB			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID (PFOA)	7.7	U		7.6	U		8.3	J	P	16	J	P	
PERFLUOROBUTANESULFONIC ACID (PFBS)	35	U		34	U		35	U		37	U		
PERFLUOROHEPTANOIC ACID (PFHPA)	3.8	U		3.8	U		2.4	J	P	5.9	J	P	
PERFLUOROHEXANESULFONIC ACID (PFHXS)	12	U		11	U		12	U		15	J	P	
PERFLUORONONANOIC ACID (PFNA)	19	U		19	U		19	U		21	U		
PERFLUOROOCTANESULFONIC ACID (PFOS)	15	U		15	U		7.1	J	P	11	J	P	

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: WGNA-073118-RW-3785 Lab Sample ID: 320-41679-1
 Matrix: Water Lab File ID: 2018.08.07_537C_025.d
 Analysis Method: 537 Date Collected: 07/31/2018 08:40
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 240.3(mL) Date Analyzed: 08/08/2018 04:50
 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.: 238610 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	11	J	42	17	7.1
335-67-1	Perfluorooctanoic acid (PFOA)	16	J	21	8.3	2.9
375-95-1	Perfluorononanoic acid (PFNA)	21	U	25	21	8.3
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	15	J	31	12	5.7
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.9	J	10	4.2	2.0
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	94	37	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	88		70-130
STL00996	13C2 PFDA	103		70-130

Ali L. Salem
09/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: WGNA-073118-FRB-3785 Lab Sample ID: 320-41679-2
 Matrix: Water Lab File ID: 2018.08.07_537C_028.d
 Analysis Method: 537 Date Collected: 07/31/2018 08:35
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 261.7(mL) Date Analyzed: 08/08/2018 05:04
 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.: 238610 Units: ng/L

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)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
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	86		70-130
STL00996	13C2 PFDA	97		70-130

Steve J. Selmer
09/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-RW-154 Lab Sample ID: 320-41679-3
 Matrix: Water Lab File ID: 2018.08.07_537C_029.d
 Analysis Method: 537 Date Collected: 07/31/2018 10:10
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 254.3(mL) Date Analyzed: 08/08/2018 05:09
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238610 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	17	J	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	24		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	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.9	J	9.8	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	80		70-130
STL00996	13C2 PFDA	94		70-130

Wesley L. Selmer
09/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-FRB-154 Lab Sample ID: 320-41679-4
 Matrix: Water Lab File ID: 2018.08.07_537C_030.d
 Analysis Method: 537 Date Collected: 07/31/2018 10:05
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 257.7(mL) Date Analyzed: 08/08/2018 05:13
 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.: 238610 Units: ng/L

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	86		70-130
STL00996	13C2 PFDA	98		70-130

Wesley L. Salomon
09/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-RW-185 Lab Sample ID: 320-41679-5
 Matrix: Water Lab File ID: 2018.08.07_537C_031.d
 Analysis Method: 537 Date Collected: 07/31/2018 11:10
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 265.9(mL) Date Analyzed: 08/08/2018 05:18
 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.: 238610 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	J	38	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	12	J	19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.5	J	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.2	J	9.4	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	81		70-130
STL00996	13C2 PFDA	94		70-130

Wesley L. Salaman
09/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-FRB-185 Lab Sample ID: 320-41679-6
 Matrix: Water Lab File ID: 2018.08.07_537C_032.d
 Analysis Method: 537 Date Collected: 07/31/2018 11:05
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 244.6(mL) Date Analyzed: 08/08/2018 05:23
 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.: 238610 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	7.0
335-67-1	Perfluorooctanoic acid (PFOA)	8.2	U	20	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	20	U	25	20	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	103		70-130

Wesley L. Salomon
09/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-RW-179 Lab Sample ID: 320-41679-7
 Matrix: Water Lab File ID: 2018.08.07_537C_035.d
 Analysis Method: 537 Date Collected: 07/31/2018 12:10
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 257.9(mL) Date Analyzed: 08/08/2018 05:37
 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.: 238612 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	17	J	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	21		19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.1	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.0	J	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	87		70-130
STL00996	13C2 PFDA	101		70-130

Wesley L. Salomon
09/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-FRB-179 Lab Sample ID: 320-41679-8
 Matrix: Water Lab File ID: 2018.08.07_537C_036.d
 Analysis Method: 537 Date Collected: 07/31/2018 12:05
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 252.9(mL) Date Analyzed: 08/08/2018 05:41
 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.: 238612 Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	101		70-130

Mari L. Selman
09/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-RW-124 Lab Sample ID: 320-41679-9
 Matrix: Water Lab File ID: 2018.08.07_537C_037.d
 Analysis Method: 537 Date Collected: 07/31/2018 12:40
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 253.7(mL) Date Analyzed: 08/08/2018 05:46
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238612 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	31	J	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	20		20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	14	J	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.7	J	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	89	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	83		70-130
STL00996	13C2 PFDA	94		70-130

Maria L. Selman

09/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-FRB-124 Lab Sample ID: 320-41679-10
 Matrix: Water Lab File ID: 2018.08.07_537C_038.d
 Analysis Method: 537 Date Collected: 07/31/2018 12:35
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 254.5 (mL) Date Analyzed: 08/08/2018 05:51
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238612 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.8	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	91		70-130

Wesley L. Salomon
09/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: WGNA-073118-RW-3103 Lab Sample ID: 320-41679-11
 Matrix: Water Lab File ID: 2018.08.07_537C_039.d
 Analysis Method: 537 Date Collected: 07/31/2018 13:40
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 259.2 (mL) Date Analyzed: 08/08/2018 05:55
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238612 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	7.1	J	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	8.3	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	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.4	J M	9.6	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U M	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	99		70-130

Teri L. Selmer
09/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: WGNA-073118-FRB-3103 Lab Sample ID: 320-41679-12
 Matrix: Water Lab File ID: 2018.08.07_537C_040.d
 Analysis Method: 537 Date Collected: 07/31/2018 13:35
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 260.7(mL) Date Analyzed: 08/08/2018 06:00
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238612 Units: ng/L

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)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	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	85		70-130
STL00996	13C2 PFDA	92		70-130

Wesley L. Salomon
09/19/2018

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: WGNA-073118-RW-3785 Lab Sample ID: 320-41679-1
 Matrix: Water Lab File ID: 2018.08.07_537C_025.d
 Analysis Method: 537 Date Collected: 07/31/2018 08:40
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 240.3(mL) Date Analyzed: 08/08/2018 04:50
 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.: 238610 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	11	J	42	17	7.1
335-67-1	Perfluorooctanoic acid (PFOA)	16	J	21	8.3	2.9
375-95-1	Perfluorononanoic acid (PFNA)	21	U	25	21	8.3
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	15	J	31	12	5.7
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.9	J	10	4.2	2.0
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	94	37	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	88		70-130
STL00996	13C2 PFDA	103		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: WGNA-073118-FRB-3785 Lab Sample ID: 320-41679-2
 Matrix: Water Lab File ID: 2018.08.07_537C_028.d
 Analysis Method: 537 Date Collected: 07/31/2018 08:35
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 261.7(mL) Date Analyzed: 08/08/2018 05:04
 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.: 238610 Units: ng/L

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)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
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	86		70-130
STL00996	13C2 PFDA	97		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-RW-154 Lab Sample ID: 320-41679-3
 Matrix: Water Lab File ID: 2018.08.07_537C_029.d
 Analysis Method: 537 Date Collected: 07/31/2018 10:10
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 254.3(mL) Date Analyzed: 08/08/2018 05:09
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238610 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	17	J	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	24		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	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.9	J	9.8	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	80		70-130
STL00996	13C2 PFDA	94		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-FRB-154 Lab Sample ID: 320-41679-4
 Matrix: Water Lab File ID: 2018.08.07_537C_030.d
 Analysis Method: 537 Date Collected: 07/31/2018 10:05
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 257.7(mL) Date Analyzed: 08/08/2018 05:13
 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.: 238610 Units: ng/L

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	86		70-130
STL00996	13C2 PFDA	98		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-RW-185 Lab Sample ID: 320-41679-5
 Matrix: Water Lab File ID: 2018.08.07_537C_031.d
 Analysis Method: 537 Date Collected: 07/31/2018 11:10
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 265.9(mL) Date Analyzed: 08/08/2018 05:18
 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.: 238610 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	J	38	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	12	J	19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.5	J	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.2	J	9.4	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	81		70-130
STL00996	13C2 PFDA	94		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-FRB-185 Lab Sample ID: 320-41679-6
 Matrix: Water Lab File ID: 2018.08.07_537C_032.d
 Analysis Method: 537 Date Collected: 07/31/2018 11:05
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 244.6(mL) Date Analyzed: 08/08/2018 05:23
 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.: 238610 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	7.0
335-67-1	Perfluorooctanoic acid (PFOA)	8.2	U	20	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	20	U	25	20	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	103		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-RW-179 Lab Sample ID: 320-41679-7
 Matrix: Water Lab File ID: 2018.08.07_537C_035.d
 Analysis Method: 537 Date Collected: 07/31/2018 12:10
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 257.9(mL) Date Analyzed: 08/08/2018 05:37
 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.: 238612 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	17	J	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	21		19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.1	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.0	J	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	87		70-130
STL00996	13C2 PFDA	101		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-FRB-179 Lab Sample ID: 320-41679-8
 Matrix: Water Lab File ID: 2018.08.07_537C_036.d
 Analysis Method: 537 Date Collected: 07/31/2018 12:05
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 252.9(mL) Date Analyzed: 08/08/2018 05:41
 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.: 238612 Units: ng/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	101		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-RW-124 Lab Sample ID: 320-41679-9
 Matrix: Water Lab File ID: 2018.08.07_537C_037.d
 Analysis Method: 537 Date Collected: 07/31/2018 12:40
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 253.7(mL) Date Analyzed: 08/08/2018 05:46
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238612 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	31	J	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	20		20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	14	J	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.7	J	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	89	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	83		70-130
STL00996	13C2 PFDA	94		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: NAWC-073118-FRB-124 Lab Sample ID: 320-41679-10
 Matrix: Water Lab File ID: 2018.08.07_537C_038.d
 Analysis Method: 537 Date Collected: 07/31/2018 12:35
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 254.5 (mL) Date Analyzed: 08/08/2018 05:51
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238612 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.8	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	91		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: WGNA-073118-RW-3103 Lab Sample ID: 320-41679-11
 Matrix: Water Lab File ID: 2018.08.07_537C_039.d
 Analysis Method: 537 Date Collected: 07/31/2018 13:40
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 259.2 (mL) Date Analyzed: 08/08/2018 05:55
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238612 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	7.1	J	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	8.3	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	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.4	J M	9.6	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U M	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	99		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: WGNA-073118-FRB-3103 Lab Sample ID: 320-41679-12
 Matrix: Water Lab File ID: 2018.08.07_537C_040.d
 Analysis Method: 537 Date Collected: 07/31/2018 13:35
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 260.7(mL) Date Analyzed: 08/08/2018 06:00
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238612 Units: ng/L

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)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	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	85		70-130
STL00996	13C2 PFDA	92		70-130

Appendix C

Support Documentation

TestAmerica
880 Riverside F
West Sacramento
phone 916.373.



320-41679 Chain of Custody

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: DW NPDES RCRA Other:

Client Contact		Project Manager: Andy Frebowitz			Site Contact: Mary Kay Bond			Date: 7/31/2018			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																				
King of Prussia, PA 19406		<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS																				
610-382-1174		TAT if different from Below 21																				
610-491-9688		<input type="checkbox"/> 2 weeks																				
Project Name: WE04		<input type="checkbox"/> 1 week																				
Site: WE04		<input type="checkbox"/> 2 days																				
P O # 1132358 (through EarthToxics)		<input type="checkbox"/> 1 day																				
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	EPA 537 UCMR3														Sample Specific Notes:
WGNA-073118-RW-3785	7/31/2018	8:40	G	DW	6	N	Y	Y														MS/MSD
WGNA-073118-FRB-3785	7/31/2018	8:35	G	DW	2	N	N	Y														Field Reagent Blank
NAWC-073118-RW-154	7/31/2018	10:10	G	DW	2	N	N	Y														Field Reagent Blank
NAWC-073118-FRB-154	7/31/2018	10:05	G	DW	2	N	N	Y														Field Reagent Blank
NAWC-073118-RW-185	7/31/2018	11:10	G	DW	2	N	N	Y														Field Reagent Blank
NAWC-073118-FRB-185	7/31/2018	11:05	G	DW	2	N	N	Y														Field Reagent Blank
NAWC-073118-RW-179	7/31/2018	12:10	G	DW	2	N	N	Y														Field Reagent Blank
NAWC-073118-FRB-179	7/31/2018	12:05	G	DW	2	N	N	Y														Field Reagent Blank
NAWC-073118-RW-124	7/31/2018	12:40	G	DW	2	N	N	Y														Field Reagent Blank
NAWC-073118-FRB-124	7/31/2018	12:35	G	DW	2	N	N	Y														Field Reagent Blank
WGNA-073118-RW-3103	7/31/2018	13:40	G	DW	2	N	N	Y														Field Reagent Blank
WGNA-073118-FRB-3103	7/31/2018	13:35	G	DW	2	N	N	Y														Field Reagent Blank
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other: Trizma								6														
Possible Hazard Identification: Comments Section if the lab is to dispose of the sample.								Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)														
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown								<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months														
Fed Ex Tracking: 7728 5616 9145																						
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No						Custody Seal No.:						Cooler Temp. (°C): Obs'd: 0.7 Corr'd: 0.7						Therm ID No.: ALS 7.e				
Relinquished by: Mary Kay Bond		Company: Tetra Tech		Date/Time: 7/31/2018 16:00		Received by: [Signature]		Company: GIA - STAC		Date/Time: 8/1/18 09:45												
Relinquished by:		Company:		Date/Time:		Received by:		Company:		Date/Time:												
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:		Company:		Date/Time:												

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Job Narrative
320-41679-1

Receipt

The samples were received on 8/1/2018 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.7° C.

LCMS

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

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

Organic Prep

Method(s) 537: The following sample: NAWC-073118-RW-154 (320-41679-3) in preparation batch 320-237969 was observed to be a yellow color prior to extraction and after it was brought to final volume.

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

Definitions/Glossary

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

Qualifiers

LCMS

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

Glossary

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

Sample Summary

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-41679-1	WGNA-073118-RW-3785	Water	07/31/18 08:40	08/01/18 09:45
320-41679-2	WGNA-073118-FRB-3785	Water	07/31/18 08:35	08/01/18 09:45
320-41679-3	NAWC-073118-RW-154	Water	07/31/18 10:10	08/01/18 09:45
320-41679-4	NAWC-073118-FRB-154	Water	07/31/18 10:05	08/01/18 09:45
320-41679-5	NAWC-073118-RW-185	Water	07/31/18 11:10	08/01/18 09:45
320-41679-6	NAWC-073118-FRB-185	Water	07/31/18 11:05	08/01/18 09:45
320-41679-7	NAWC-073118-RW-179	Water	07/31/18 12:10	08/01/18 09:45
320-41679-8	NAWC-073118-FRB-179	Water	07/31/18 12:05	08/01/18 09:45
320-41679-9	NAWC-073118-RW-124	Water	07/31/18 12:40	08/01/18 09:45
320-41679-10	NAWC-073118-FRB-124	Water	07/31/18 12:35	08/01/18 09:45
320-41679-11	WGNA-073118-RW-3103	Water	07/31/18 13:40	08/01/18 09:45
320-41679-12	WGNA-073118-FRB-3103	Water	07/31/18 13:35	08/01/18 09:45

Method Summary

Client: Tetra Tech, Inc.
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-41679-1

SDG No.: _____

Matrix: Water

Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WGNA-073118-RW-378 5	320-41679-1	88	103
WGNA-073118-FRB-37 85	320-41679-2	86	97
NAWC-073118-RW-154	320-41679-3	80	94
NAWC-073118-FRB-15 4	320-41679-4	86	98
NAWC-073118-RW-185	320-41679-5	81	94
NAWC-073118-FRB-18 5	320-41679-6	98	103
NAWC-073118-RW-179	320-41679-7	87	101
NAWC-073118-FRB-17 9	320-41679-8	87	101
NAWC-073118-RW-124	320-41679-9	83	94
NAWC-073118-FRB-12 4	320-41679-10	87	91
WGNA-073118-RW-310 3	320-41679-11	90	99
WGNA-073118-FRB-31 03	320-41679-12	85	92
	MB 320-237969/1-A	90	95
	LCS 320-237969/2-A	88	94
WGNA-073118-RW-378 5 MS	320-41679-1 MS	90	98
WGNA-073118-RW-378 5 MSD	320-41679-1 MSD	86	99

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.: 320-41679-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.08.07_537C_024.d
 Lab ID: LCS 320-237969/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	132	138	104	70-130	
Perfluorooctanoic acid (PFOA)	66.0	68.3	103	70-130	
Perfluorononanoic acid (PFNA)	66.0	64.4	98	70-130	
Perfluorohexanesulfonic acid (PFHxS)	100	107	107	70-130	
Perfluoroheptanoic acid (PFHpA)	32.0	32.1	100	70-130	
Perfluorobutanesulfonic acid (PFBS)	300	321	107	70-130	

Column to be used to flag recovery and RPD values

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.08.07_537C_026.d
 Lab ID: 320-41679-1 MS Client ID: WGNA-073118-RW-3785 MS

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	131	11 J	146	103	70-130	
Perfluorooctanoic acid (PFOA)	65.8	16 J	79.2	97	70-130	
Perfluorononanoic acid (PFNA)	65.8	21 U	64.8	99	70-130	
Perfluorohexanesulfonic acid (PFHxS)	99.8	15 J	118	103	70-130	
Perfluoroheptanoic acid (PFHpA)	31.9	5.9 J	34.3	89	70-130	
Perfluorobutanesulfonic acid (PFBS)	299	37 U	325	109	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.: 320-41679-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.08.07_537C_027.d
 Lab ID: 320-41679-1 MSD Client ID: WGNA-073118-RW-3785 MSD

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	135	151	104	3	30	70-130	
Perfluorooctanoic acid (PFOA)	67.8	80.0	95	1	30	70-130	
Perfluorononanoic acid (PFNA)	67.8	65.2	96	1	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	103	120	103	2	30	70-130	
Perfluoroheptanoic acid (PFHpA)	32.9	35.1	89	2	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	308	335	109	3	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.: 320-41679-1
 SDG No.: _____
 Lab File ID: 2018.08.07_537C_023.d Lab Sample ID: MB 320-237969/1-A
 Matrix: Water Date Extracted: 08/04/2018 08:24
 Instrument ID: A8_N Date Analyzed: 08/08/2018 04:40
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-237969/2-A	2018.08.07_537C_024.d	08/08/2018 04:45
WGNA-073118-RW-3785	320-41679-1	2018.08.07_537C_025.d	08/08/2018 04:50
WGNA-073118-RW-3785 MS	320-41679-1 MS	2018.08.07_537C_026.d	08/08/2018 04:55
WGNA-073118-RW-3785 MSD	320-41679-1 MSD	2018.08.07_537C_027.d	08/08/2018 04:59
WGNA-073118-FRB-3785	320-41679-2	2018.08.07_537C_028.d	08/08/2018 05:04
NAWC-073118-RW-154	320-41679-3	2018.08.07_537C_029.d	08/08/2018 05:09
NAWC-073118-FRB-154	320-41679-4	2018.08.07_537C_030.d	08/08/2018 05:13
NAWC-073118-RW-185	320-41679-5	2018.08.07_537C_031.d	08/08/2018 05:18
NAWC-073118-FRB-185	320-41679-6	2018.08.07_537C_032.d	08/08/2018 05:23
NAWC-073118-RW-179	320-41679-7	2018.08.07_537C_035.d	08/08/2018 05:37
NAWC-073118-FRB-179	320-41679-8	2018.08.07_537C_036.d	08/08/2018 05:41
NAWC-073118-RW-124	320-41679-9	2018.08.07_537C_037.d	08/08/2018 05:46
NAWC-073118-FRB-124	320-41679-10	2018.08.07_537C_038.d	08/08/2018 05:51
WGNA-073118-RW-3103	320-41679-11	2018.08.07_537C_039.d	08/08/2018 05:55
WGNA-073118-FRB-3103	320-41679-12	2018.08.07_537C_040.d	08/08/2018 06:00

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-237969/1-A
 Matrix: Water Lab File ID: 2018.08.07_537C_023.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24
 Sample wt/vol: 250 (mL) Date Analyzed: 08/08/2018 04:40
 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.: 238610 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	90		70-130
STL00996	13C2 PFDA	95		70-130

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Instrument ID: A8_N Calibration Start Date: 08/07/2018 12:44
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 08/07/2018 13:07
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	1166146	1.77	2617368	2.02		
UPPER LIMIT	1749219	2.27	3926052	2.52		
LOWER LIMIT	583073	1.27	1308684	1.52		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-238469/9	1156656	1.77	2655389	2.01		
ICV 320-238469/11	1199776	1.78	2744266	2.01		
CCVL 320-238776/1	1231833	1.76	2765004	2.00		
CCV 320-238610/1 CCVIS	1104849	1.76	2591082	1.99		
MB 320-237969/1-A	1310053	1.76	2893199	2.00		
LCS 320-237969/2-A	1249637	1.76	2724470	2.00		
320-41679-1	WGNA-073118-RW-3785	1291243	1.76	2903279	2.00	
320-41679-1 MS	WGNA-073118-RW-3785 MS	1422947	1.76	3131824	2.00	
320-41679-1 MSD	WGNA-073118-RW-3785 MSD	1410294	1.76	3025296	1.99	
320-41679-2	WGNA-073118-FRB-3785	1318818	1.75	2897246	1.99	
320-41679-3	NAWC-073118-RW-154	1216043	1.76	2589046	2.00	
320-41679-4	NAWC-073118-FRB-154	1282240	1.75	2710739	1.99	
320-41679-5	NAWC-073118-RW-185	1395103	1.75	2974332	1.98	
320-41679-6	NAWC-073118-FRB-185	1180694	1.76	2717096	2.00	
CCV 320-238610/13 CCVIS		1097335	1.76	2390195	2.00	
CCV 320-238612/13 CCVIS		1097335	1.76	2390195	2.00	
320-41679-7	NAWC-073118-RW-179	1328558	1.76	2933682	1.99	
320-41679-8	NAWC-073118-FRB-179	1340148	1.76	2940104	1.99	
320-41679-9	NAWC-073118-RW-124	1465526	1.76	3163107	2.00	
320-41679-10	NAWC-073118-FRB-124	1319545	1.76	2963050	1.99	
320-41679-11	WGNA-073118-RW-3103	1125238	1.75	2495650	1.99	
320-41679-12	WGNA-073118-FRB-3103	1179781	1.76	2532682	1.99	
CCV 320-238612/21 CCVIS		1095270	1.75	2475586	1.99	

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Sample No.: CCV 320-238610/1 Date Analyzed: 08/08/2018 04:31
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.07_537C_021 Heated Purge: (Y/N) N
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1104849	1.76	2591082	1.99		
UPPER LIMIT	1546789	2.26	3627515	2.49		
LOWER LIMIT	773394	1.26	1813757	1.49		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-237969/1-A		1310053	1.76	2893199	2.00	
LCS 320-237969/2-A		1249637	1.76	2724470	2.00	
320-41679-1	WGNA-073118-RW-3785	1291243	1.76	2903279	2.00	
320-41679-1 MS	WGNA-073118-RW-3785 MS	1422947	1.76	3131824	2.00	
320-41679-1 MSD	WGNA-073118-RW-3785 MSD	1410294	1.76	3025296	1.99	
320-41679-2	WGNA-073118-FRB-3785	1318818	1.75	2897246	1.99	
320-41679-3	NAWC-073118-RW-154	1216043	1.76	2589046	2.00	
320-41679-4	NAWC-073118-FRB-154	1282240	1.75	2710739	1.99	
320-41679-5	NAWC-073118-RW-185	1395103	1.75	2974332	1.98	
320-41679-6	NAWC-073118-FRB-185	1180694	1.76	2717096	2.00	

13PFOA = 13C2-PFOA
 13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS
 PFOS = 13C4 PFOS
 Area Limit = 70%-140% of internal standard area
 RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Sample No.: CCV 320-238610/13 Date Analyzed: 08/08/2018 05:27
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.07_537C_033 Heated Purge: (Y/N) N
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1097335	1.76	2390195	2.00		
UPPER LIMIT	1536269	2.26	3346273	2.50		
LOWER LIMIT	768135	1.26	1673137	1.50		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-237969/1-A		1310053	1.76	2893199	2.00	
LCS 320-237969/2-A		1249637	1.76	2724470	2.00	
320-41679-1	WGNA-073118-RW-3785	1291243	1.76	2903279	2.00	
320-41679-1 MS	WGNA-073118-RW-3785 MS	1422947	1.76	3131824	2.00	
320-41679-1 MSD	WGNA-073118-RW-3785 MSD	1410294	1.76	3025296	1.99	
320-41679-2	WGNA-073118-FRB-3785	1318818	1.75	2897246	1.99	
320-41679-3	NAWC-073118-RW-154	1216043	1.76	2589046	2.00	
320-41679-4	NAWC-073118-FRB-154	1282240	1.75	2710739	1.99	
320-41679-5	NAWC-073118-RW-185	1395103	1.75	2974332	1.98	
320-41679-6	NAWC-073118-FRB-185	1180694	1.76	2717096	2.00	

13PFOA = 13C2-PFOA
 13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS
 PFOS = 13C4 PFOS
 Area Limit = 70%-140% of internal standard area
 RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Sample No.: CCV 320-238612/13 Date Analyzed: 08/08/2018 05:27
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.07_537C_033 Heated Purge: (Y/N) N
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1097335	1.76	2390195	2.00		
UPPER LIMIT	1536269	2.26	3346273	2.50		
LOWER LIMIT	768135	1.26	1673137	1.50		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-41679-7	NAWC-073118-RW-179	1328558	1.76	2933682	1.99	
320-41679-8	NAWC-073118-FRB-179	1340148	1.76	2940104	1.99	
320-41679-9	NAWC-073118-RW-124	1465526	1.76	3163107	2.00	
320-41679-10	NAWC-073118-FRB-124	1319545	1.76	2963050	1.99	
320-41679-11	WGNA-073118-RW-3103	1125238	1.75	2495650	1.99	
320-41679-12	WGNA-073118-FRB-3103	1179781	1.76	2532682	1.99	

13PFOA = 13C2-PFOA
 13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS
 PFOS = 13C4 PFOS
 Area Limit = 70%-140% of internal standard area
 RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Sample No.: CCV 320-238612/21 Date Analyzed: 08/08/2018 06:05
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.07_537C_041 Heated Purge: (Y/N) N
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1095270	1.75	2475586	1.99		
UPPER LIMIT	1533378	2.25	3465820	2.49		
LOWER LIMIT	766689	1.25	1732910	1.49		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-41679-7	NAWC-073118-RW-179	1328558	1.76	2933682	1.99	
320-41679-8	NAWC-073118-FRB-179	1340148	1.76	2940104	1.99	
320-41679-9	NAWC-073118-RW-124	1465526	1.76	3163107	2.00	
320-41679-10	NAWC-073118-FRB-124	1319545	1.76	2963050	1.99	
320-41679-11	WGNA-073118-RW-3103	1125238	1.75	2495650	1.99	
320-41679-12	WGNA-073118-FRB-3103	1179781	1.76	2532682	1.99	

13PFOA = 13C2-PFOA
 13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS
 PFOS = 13C4 PFOS
 Area Limit = 70%-140% of internal standard area
 RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

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

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1 Analy Batch No.: 238469

SDG No.: _____

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

Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238469/2	2018.08.07_537CURVE_003.d
Level 2	IC 320-238469/3	2018.08.07_537CURVE_004.d
Level 3	IC 320-238469/4	2018.08.07_537CURVE_005.d
Level 4	IC 320-238469/5	2018.08.07_537CURVE_006.d
Level 5	IC 320-238469/6	2018.08.07_537CURVE_007.d
Level 6	IC 320-238469/7	2018.08.07_537CURVE_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R ² OR COD	#	MIN R ² OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	1.2685 1.0148	1.2167	1.2831	1.2045	1.1178	Ave		1.1842			8.6		30.0				
Perfluorohexanesulfonic acid (PFHxS)	1.7386 1.7965	1.7248	1.7859	1.8499	1.8020	Ave		1.7830			2.6		30.0				
Perfluoroheptanoic acid (PFHpA)	+++++ 1.0701	1.0598	1.0963	1.0908	1.0612	Ave		1.0756			1.6		30.0				
Perfluorooctanoic acid (PFOA)	1.1708 1.0787	1.0454	1.0799	1.1146	1.0831	Ave		1.0954			3.9		30.0				
Perfluorooctanesulfonic acid (PFOS)	1.0605 1.1104	1.0466	1.1058	1.0956	1.1304	Ave		1.0915			2.9		30.0				
Perfluorononanoic acid (PFNA)	0.7952 0.7829	0.7632	0.7779	0.8207	0.7892	Ave		0.7882			2.5		30.0				
13C2 PFHxA	1.1215 1.1209	1.0683	1.0729	1.1134	1.1007	Ave		1.0996			2.2		30.0				
13C2 PFDA	0.8149 0.8273	0.8350	0.7672	0.8515	0.8172	Ave		0.8189			3.5		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.: 320-41679-1 Analy Batch No.: 238469

SDG No.: _____

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

Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238469/2	2018.08.07_537CURVE_003.d
Level 2	IC 320-238469/3	2018.08.07_537CURVE_004.d
Level 3	IC 320-238469/4	2018.08.07_537CURVE_005.d
Level 4	IC 320-238469/5	2018.08.07_537CURVE_006.d
Level 5	IC 320-238469/6	2018.08.07_537CURVE_007.d
Level 6	IC 320-238469/7	2018.08.07_537CURVE_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	1093854 16487048	2326382	5241287	9203217	13659010	9.00 180	20.0	45.0	90.1	135
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	500314 9803009	1107645	2450188	4747515	7395512	3.00 60.5	6.72	15.1	30.2	45.4
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	++++ 2459664	275735	621773	1128009	1828933	++++ 19.4	2.16	4.86	9.72	14.6
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	277484 5050799	554036	1247621	2347790	3802739	1.98 39.6	4.40	9.90	19.8	29.7
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	401757 7918924	878368	1982811	3674504	6063022	3.95 79.1	8.79	19.8	39.5	59.3
Perfluorononanoic acid (PFNA)	13PF OA	Ave	188460 3665889	404484	898787	1728770	2770632	1.98 39.6	4.40	9.90	19.8	29.7
13C2 PFHxA	13PF OA	Ave	1342383 1325342	1286815	1252048	1184544	1301097	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	975454 978205	1005796	895349	905914	965975	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD

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

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1 Analy Batch No.: 238469

SDG No.: _____

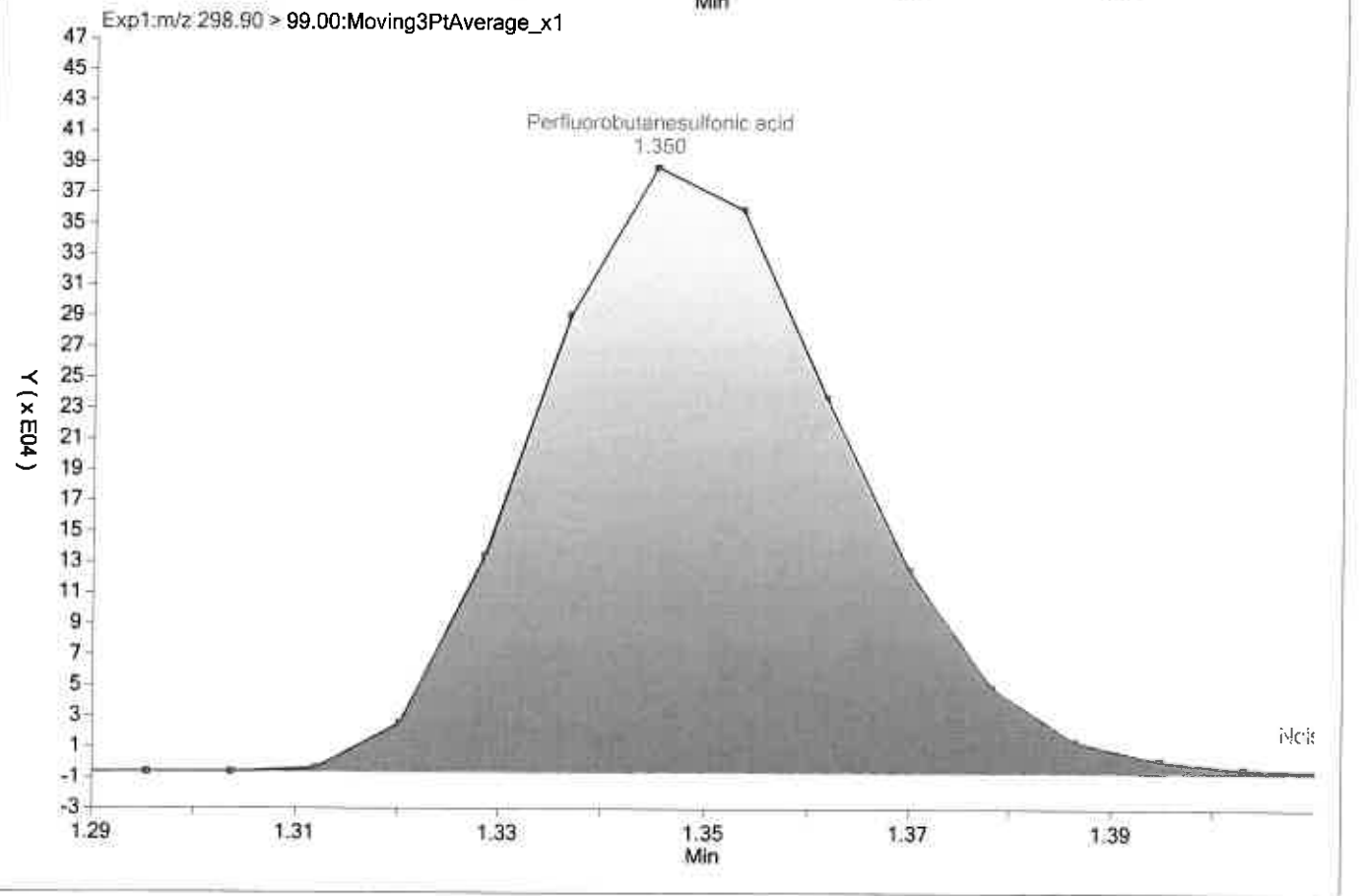
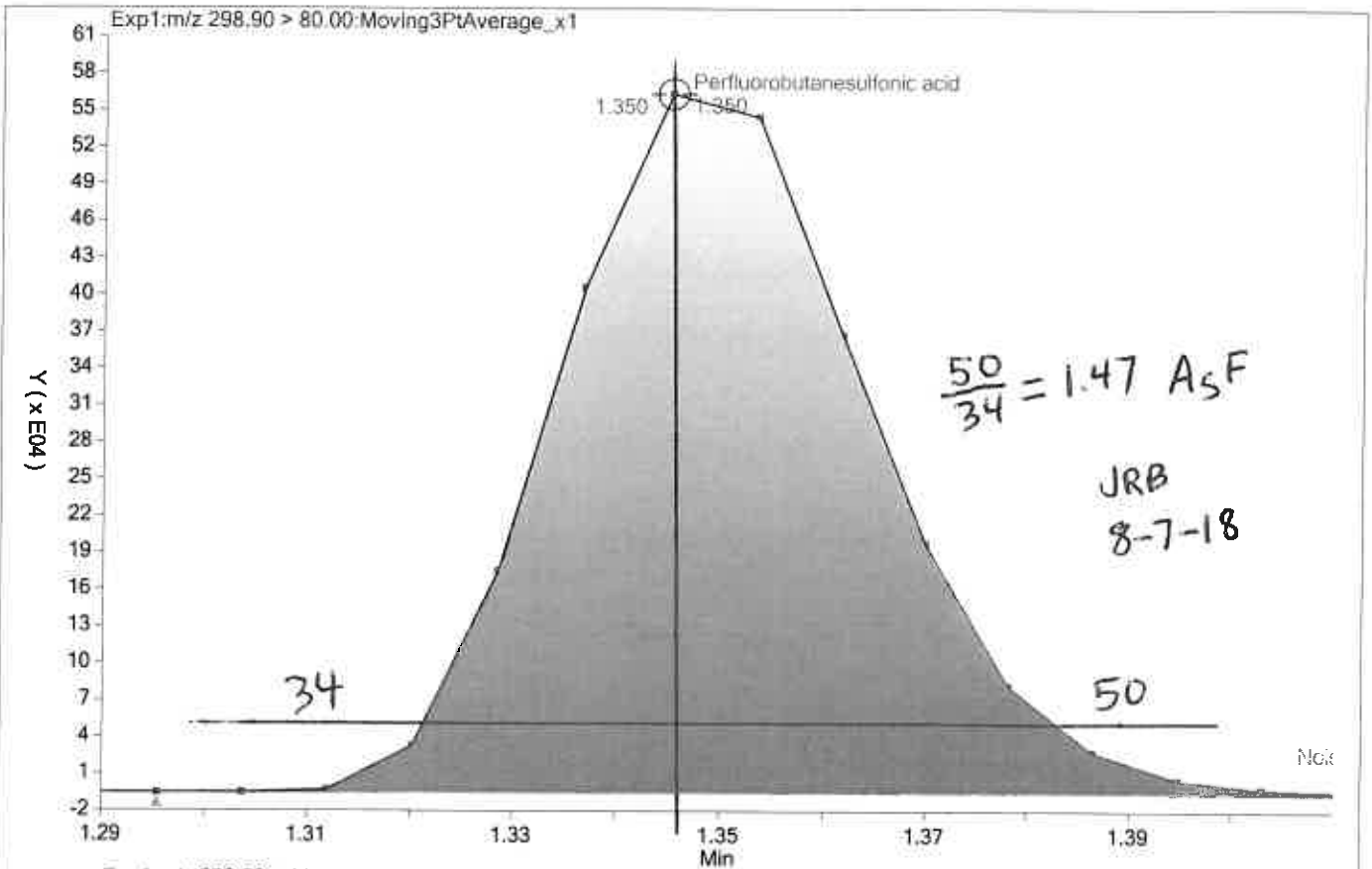
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

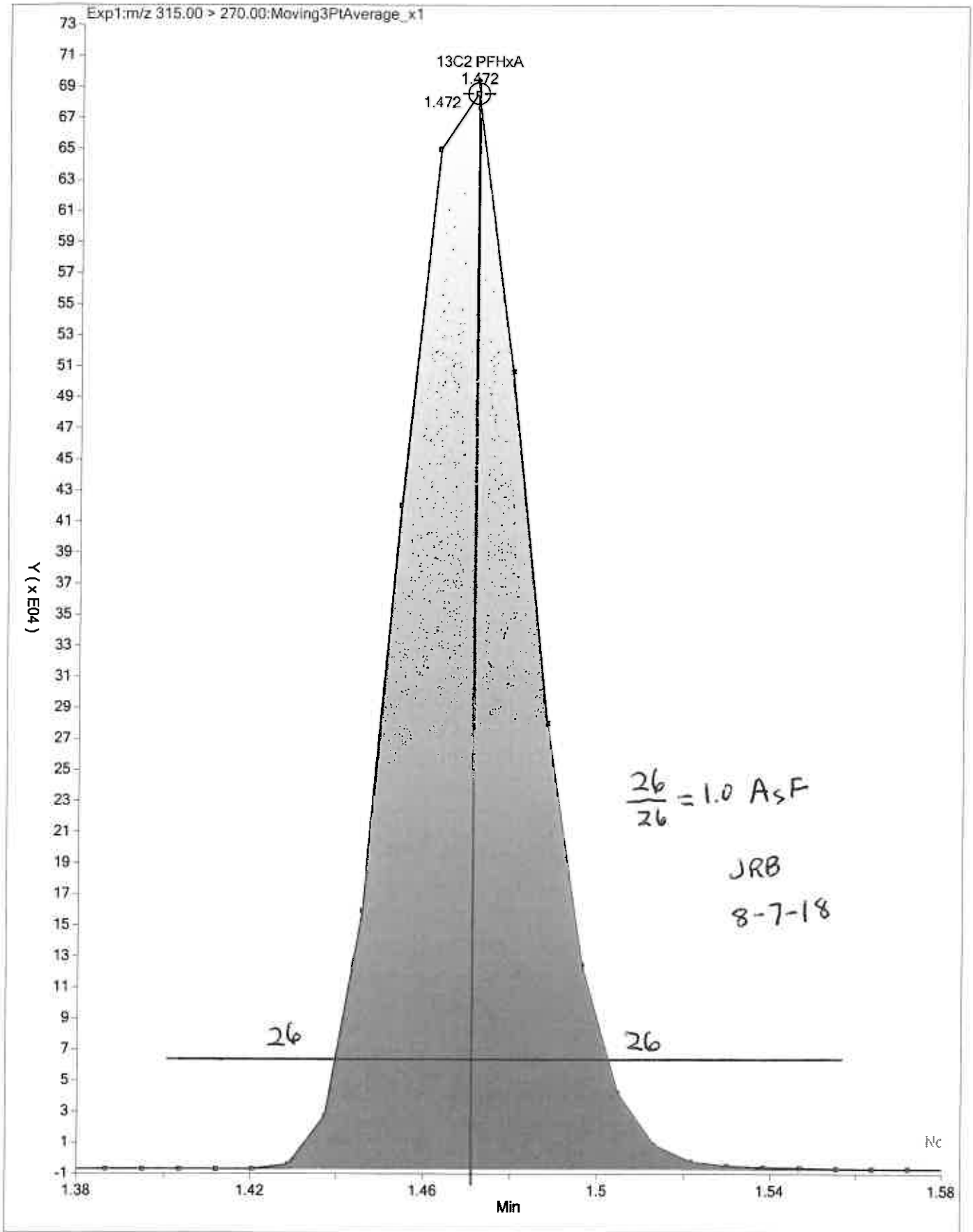
Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238469/2	2018.08.07_537CURVE_003.d
Level 2	IC 320-238469/3	2018.08.07_537CURVE_004.d
Level 3	IC 320-238469/4	2018.08.07_537CURVE_005.d
Level 4	IC 320-238469/5	2018.08.07_537CURVE_006.d
Level 5	IC 320-238469/6	2018.08.07_537CURVE_007.d
Level 6	IC 320-238469/7	2018.08.07_537CURVE_008.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)	7.1	2.7	8.3	1.7	-5.6	-14.3	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	-2.5	-3.3	0.2	3.8	1.1	0.8	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	++++	-1.5	1.9	1.4	-1.3	-0.5		50	30	30	30	30
Perfluorooctanoic acid (PFOA)	6.9	-4.6	-1.4	1.7	-1.1	-1.5	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-2.8	-4.1	1.3	0.4	3.6	1.7	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	0.9	-3.2	-1.3	4.1	0.1	-0.7	50	30	30	30	30	30
13C2 PFHxA	2.0	-2.8	-2.4	1.3	0.1	1.9	30	30	30	30	30	30
13C2 PFDA	-0.5	2.0	-6.3	4.0	-0.2	1.0	30	30	30	30	30	30





FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-238469/9 Calibration Date: 08/07/2018 13:16
 Instrument ID: A8_N Calib Start Date: 08/07/2018 12:44
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07
 Lab File ID: 2018.08.07_537CURVE_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.259		21.3	20.0	6.3	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.049		2.11	2.16	-2.5	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.727		6.51	6.72	-3.2	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.051		4.22	4.40	-4.1	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.042		8.39	8.79	-4.5	50.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7696		4.30	4.40	-2.4	50.0
13C2 PFHxA	Ave	1.100	1.095		9.96	10.0	-0.4	30.0
13C2 PFDA	Ave	0.8189	0.8007		9.78	10.0	-2.2	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Lab Sample ID: ICV 320-238469/11 Calibration Date: 08/07/2018 13:26
 Instrument ID: A8_N Calib Start Date: 08/07/2018 12:44
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07
 Lab File ID: 2018.08.07_537CURVE_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	0.997		84.2	100	-15.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	0.9540		8.87	10.0	-11.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.603		18.1	20.2	-10.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	0.9056		16.7	20.2	-17.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	0.9574		17.7	20.2	-12.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7380		18.9	20.2	-6.4	30.0
13C2 PFHxA	Ave	1.100	1.045		9.51	10.0	-4.9	30.0
13C2 PFDA	Ave	0.8189	0.7952		9.71	10.0	-2.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-238776/1 Calibration Date: 08/08/2018 03:07
 Instrument ID: A8_N Calib Start Date: 08/07/2018 12:44
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07
 Lab File ID: 2018.08.07_537C_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.243		21.0	20.0	4.9	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.031		2.07	2.16	-4.2	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.702		6.42	6.72	-4.5	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.034		4.15	4.40	-5.6	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.067		8.59	8.79	-2.2	50.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7564		4.22	4.40	-4.0	50.0
13C2 PFHxA	Ave	1.100	1.051		9.56	10.0	-4.4	30.0
13C2 PFDA	Ave	0.8189	0.7584		9.26	10.0	-7.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Lab Sample ID: CCV 320-238610/1 Calibration Date: 08/08/2018 04:31
 Instrument ID: A8_N Calib Start Date: 08/07/2018 12:44
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07
 Lab File ID: 2018.08.07_537C_021.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.228		46.7	45.0	3.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.077		4.87	4.86	0.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.742		14.8	15.1	-2.3	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.069		9.66	9.90	-2.4	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.062		19.2	19.8	-2.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.8206		10.3	9.90	4.1	30.0
13C2 PFHxA	Ave	1.100	1.088		9.89	10.0	-1.1	30.0
13C2 PFDA	Ave	0.8189	0.7990		9.76	10.0	-2.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Lab Sample ID: CCV 320-238610/13 Calibration Date: 08/08/2018 05:27
 Instrument ID: A8_N Calib Start Date: 08/07/2018 12:44
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07
 Lab File ID: 2018.08.07_537C_033.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.165		133	135	-1.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.063		14.4	14.6	-1.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.839		46.8	45.4	3.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.094		29.7	29.7	-0.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.131		61.4	59.3	3.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7713		29.1	29.7	-2.1	30.0
13C2 PFHxA	Ave	1.100	1.074		9.77	10.0	-2.3	30.0
13C2 PFDA	Ave	0.8189	0.8057		9.84	10.0	-1.6	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Lab Sample ID: CCV 320-238612/13 Calibration Date: 08/08/2018 05:27
 Instrument ID: A8_N Calib Start Date: 08/07/2018 12:44
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07
 Lab File ID: 2018.08.07_537C_033.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.165		133	135	-1.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.063		14.4	14.6	-1.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.839		46.8	45.4	3.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.094		29.7	29.7	-0.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.131		61.4	59.3	3.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7713		29.1	29.7	-2.1	30.0
13C2 PFHxA	Ave	1.100	1.074		9.77	10.0	-2.3	30.0
13C2 PFDA	Ave	0.8189	0.8057		9.84	10.0	-1.6	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1
 SDG No.: _____
 Lab Sample ID: CCV 320-238612/21 Calibration Date: 08/08/2018 06:05
 Instrument ID: A8_N Calib Start Date: 08/07/2018 12:44
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07
 Lab File ID: 2018.08.07_537C_041.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.278		48.6	45.0	7.9	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.067		4.82	4.86	-0.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.744		14.8	15.1	-2.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.044		9.44	9.90	-4.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.080		19.6	19.8	-1.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7579		9.52	9.90	-3.8	30.0
13C2 PFHxA	Ave	1.100	1.058		9.62	10.0	-3.8	30.0
13C2 PFDA	Ave	0.8189	0.7925		9.68	10.0	-3.2	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/07/2018 12:44

Analysis Batch Number: 238469 End Date: 08/07/2018 13:26

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-238469/2		08/07/2018 12:44	1	2018.08.07_537C URVE 003.d	GeminiC18 3x100 3(mm)
IC 320-238469/3		08/07/2018 12:48	1	2018.08.07_537C URVE 004.d	GeminiC18 3x100 3(mm)
IC 320-238469/4		08/07/2018 12:53	1	2018.08.07_537C URVE 005.d	GeminiC18 3x100 3(mm)
IC 320-238469/5 ICISAV		08/07/2018 12:58	1	2018.08.07_537C URVE 006.d	GeminiC18 3x100 3(mm)
IC 320-238469/6		08/07/2018 13:02	1	2018.08.07_537C URVE 007.d	GeminiC18 3x100 3(mm)
IC 320-238469/7		08/07/2018 13:07	1	2018.08.07_537C URVE 008.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/07/2018 13:12	1		GeminiC18 3x100 3(mm)
CCVL 320-238469/9		08/07/2018 13:16	1	2018.08.07_537C URVE 010.d	GeminiC18 3x100 3(mm)
ICB 320-238469/10		08/07/2018 13:21	1		GeminiC18 3x100 3(mm)
ICV 320-238469/11		08/07/2018 13:26	1	2018.08.07_537C URVE 012.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/08/2018 04:31

Analysis Batch Number: 238610 End Date: 08/08/2018 05:27

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-238610/1 CCVIS		08/08/2018 04:31	1	2018.08.07_537C 021.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/08/2018 04:36	1		GeminiC18 3x100 3(mm)
MB 320-237969/1-A		08/08/2018 04:40	1	2018.08.07_537C 023.d	GeminiC18 3x100 3(mm)
LCS 320-237969/2-A		08/08/2018 04:45	1	2018.08.07_537C 024.d	GeminiC18 3x100 3(mm)
320-41679-1		08/08/2018 04:50	1	2018.08.07_537C 025.d	GeminiC18 3x100 3(mm)
320-41679-1 MS		08/08/2018 04:55	1	2018.08.07_537C 026.d	GeminiC18 3x100 3(mm)
320-41679-1 MSD		08/08/2018 04:59	1	2018.08.07_537C 027.d	GeminiC18 3x100 3(mm)
320-41679-2		08/08/2018 05:04	1	2018.08.07_537C 028.d	GeminiC18 3x100 3(mm)
320-41679-3		08/08/2018 05:09	1	2018.08.07_537C 029.d	GeminiC18 3x100 3(mm)
320-41679-4		08/08/2018 05:13	1	2018.08.07_537C 030.d	GeminiC18 3x100 3(mm)
320-41679-5		08/08/2018 05:18	1	2018.08.07_537C 031.d	GeminiC18 3x100 3(mm)
320-41679-6		08/08/2018 05:23	1	2018.08.07_537C 032.d	GeminiC18 3x100 3(mm)
CCV 320-238610/13 CCVIS		08/08/2018 05:27	1	2018.08.07_537C 033.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/08/2018 05:27

Analysis Batch Number: 238612 End Date: 08/08/2018 06:05

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-238612/13 CCVIS		08/08/2018 05:27	1	2018.08.07_537C 033.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/08/2018 05:32	1		GeminiC18 3x100 3(mm)
320-41679-7		08/08/2018 05:37	1	2018.08.07_537C 035.d	GeminiC18 3x100 3(mm)
320-41679-8		08/08/2018 05:41	1	2018.08.07_537C 036.d	GeminiC18 3x100 3(mm)
320-41679-9		08/08/2018 05:46	1	2018.08.07_537C 037.d	GeminiC18 3x100 3(mm)
320-41679-10		08/08/2018 05:51	1	2018.08.07_537C 038.d	GeminiC18 3x100 3(mm)
320-41679-11		08/08/2018 05:55	1	2018.08.07_537C 039.d	GeminiC18 3x100 3(mm)
320-41679-12		08/08/2018 06:00	1	2018.08.07_537C 040.d	GeminiC18 3x100 3(mm)
CCV 320-238612/21 CCVIS		08/08/2018 06:05	1	2018.08.07_537C 041.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/08/2018 03:07

Analysis Batch Number: 238776 End Date: 08/08/2018 03:44

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-238776/1		08/08/2018 03:07	1	2018.08.07_537C 003.d	GeminiC18 3x100 3(mm)
CCV 320-238776/9 CCVIS		08/08/2018 03:44	1		GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: _____

Batch Number: 237969 Batch Start Date: 08/04/18 08:23 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 08/06/18 16:10

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00077
MB 320-237969/1		537, 537				250 mL	1.00 mL	7 SU	100 uL
LCS 320-237969/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-41679-A-1	WGNA-073118-RW-3785	537, 537	T	268.98 g	28.72 g	240.3 mL	1.00 mL	7 SU	100 uL
320-41679-A-1	WGNA-073118-RW-3785	537, 537	T	280.33 g	29.49 g	250.8 mL	1.00 mL	7 SU	100 uL
320-41679-A-1	WGNA-073118-RW-3785	537, 537	T	272.17 g	28.72 g	243.5 mL	1.00 mL	7 SU	100 uL
320-41679-A-2	WGNA-073118-FRB-3785	537, 537	T	290.25 g	28.58 g	261.7 mL	1.00 mL	7 SU	100 uL
320-41679-A-3	NAWC-073118-RW-154	537, 537	T	283.01 g	28.71 g	254.3 mL	1.00 mL	7 SU	100 uL
320-41679-A-4	NAWC-073118-FRB-154	537, 537	T	286.19 g	28.51 g	257.7 mL	1.00 mL	7 SU	100 uL
320-41679-A-5	NAWC-073118-RW-185	537, 537	T	294.61 g	28.72 g	265.9 mL	1.00 mL	7 SU	100 uL
320-41679-A-6	NAWC-073118-FRB-185	537, 537	T	273.79 g	29.21 g	244.6 mL	1.00 mL	7 SU	100 uL
320-41679-A-7	NAWC-073118-RW-179	537, 537	T	287.71 g	29.85 g	257.9 mL	1.00 mL	7 SU	100 uL
320-41679-A-8	NAWC-073118-FRB-179	537, 537	T	283.90 g	31.05 g	252.9 mL	1.00 mL	7 SU	100 uL
320-41679-A-9	NAWC-073118-RW-124	537, 537	T	283.41 g	29.69 g	253.7 mL	1.00 mL	7 SU	100 uL
320-41679-A-10	NAWC-073118-FRB-124	537, 537	T	283.12 g	28.63 g	254.5 mL	1.00 mL	7 SU	100 uL
320-41679-A-11	WGNA-073118-RW-3103	537, 537	T	288.10 g	28.95 g	259.2 mL	1.00 mL	7 SU	100 uL
320-41679-A-12	WGNA-073118-FRB-3103	537, 537	T	289.49 g	28.81 g	260.7 mL	1.00 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-MSP 00033	LC537-SU 00074	AnalysisComment			
MB 320-237969/1		537, 537			100 uL	Chlorine, ND			
LCS 320-237969/2		537, 537		100 uL	100 uL	Chlorine, ND			
320-41679-A-1	WGNA-073118-RW-3785	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-1	WGNA-073118-RW-3785	537, 537	T	100 uL	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.: 320-41679-1

SDG No.: _____

Batch Number: 237969 Batch Start Date: 08/04/18 08:23 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 08/06/18 16:10

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-MSP 00033	LC537-SU 00074	AnalysisComment			
320-41679-A-1 MSD	WGNA-073118-RW-3 785	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41679-A-2	WGNA-073118-FRB- 3785	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-3	NAWC-073118-RW-1 54	537, 537	T		100 uL	Chlorine, ND. Yellow color after extraction			
320-41679-A-4	NAWC-073118-FRB- 154	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-5	NAWC-073118-RW-1 85	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-6	NAWC-073118-FRB- 185	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-7	NAWC-073118-RW-1 79	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-8	NAWC-073118-FRB- 179	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-9	NAWC-073118-RW-1 24	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-10	NAWC-073118-FRB- 124	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-11	WGNA-073118-RW-3 103	537, 537	T		100 uL	Chlorine, ND			
320-41679-A-12	WGNA-073118-FRB- 3103	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.: 320-41679-1

SDG No.: _____

Batch Number: 237969 Batch Start Date: 08/04/18 08:23 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 08/06/18 16:10

Batch Notes	
Analyst ID - Aliquot Step	SKD
Batch Comment	Client labels match TA label, SKD 08/04/18
Analyst ID - Concentration	SKD
Analyst ID - Final Volume Step	SKD
Internal Standard ID#	1303558
Manifold ID	1, 3
Methanol ID	1319281
pH Indicator ID	0818
Pipette ID	R40536G, I46345G
Analyst ID - IS Reagent Drop	SKD
Analyst ID - IS Reagent Drop Witness	TWL
Analyst ID - SU Reagent Drop	SKD
Analyst ID - SU Reagent Drop Witness	VPM
Analyst ID - TA Reagent Drop	SKD
Analyst ID - TA Reagent Drop Witness	VPM
SPE Cartridge Lot ID	6390138-02
Trizma ID	SLBR5241V
Reagent Water ID	08/02/18

Basis	Basis Description
T	Total/NA

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

PFAS Calibration Calculations:

Initial Calibration
Instrument A8_N

8/7/2018

PFOA

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
1.98	277484	1196979	10	1.17081	1.1708
4.4	554036	1204534	10	1.04536	1.0454
9.9	1247621	1167019	10	1.07987	1.0799
19.8	2347790	1063858	10	1.11458	1.1146
29.7	3802739	1182103	10	1.08314	1.0831
39.6	5050799	1182381	10	1.07872	1.0787
Average				1.09541	1.0954
Standard Deviation				0.0430	
RSD				0.0392	
%RSD				3.92191	3.9

Continuing Calibration

08/08/2018 @ 4:31

PFOA

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
9.9	1169317	1104849	10	1.0690	-2.406385	1.069	-2.4

Sample Identification
Compound

WGNA-073118-RW-3785
PFOA

Compound Area	531097	Average RRF	1.0954
Internal Standard Amount (ng)	10	Sample Volume(ml)	240.3
Dilution Factor	1	Volume Extract (ml)	1
Internal Standard Area	1291243	Injection Volume (µl)	1
Concentration	15.6257 ng/L		
Reported Result	16 ng/L		

MA/MSD %R

WGNA-073118-RW-3785			
PFOA MS %R	Spike amount	MS concentration	Sample Result
96.05	65.8	79.2	16
PFOA MSD %R	Spike amount	MSD concentration	Sample Result
94.40	67.8	80	16
MS/MSD RPD			
	-1.01		

Surrogate PFHxA

Compound Area	1250801		
Internal Standard Amount (ng)	10		
Dilution Factor	1	Volume Extract (ml)	1
Internal Standard Area	1291243	Injection Volume (µl)	1
Average RRF	1.0996		
Concentration	8.8094		
Surrogate %R	88.09	Spike amount	10

LCS %R

320-237969/2-A			
PFOA	Spike amount	LCS concentration	
103.48	66	68.3	

DODCMD_ID	INSTALLATION_ID	SDG	SITE_NAME	NORM_SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE	ANALYTICAL_METHOD	ANALYTICAL_METHOD_GRP_DESC
MID_ATLANTIC	WARMINSTER_NAWC	320-41679-1							N6247016D9008	WE04	TETRA TECH, INC.	NAWC-073118-FRB-124	Water for QC samples	Field Reagent Blank	31-Jul-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	WARMINSTER_NAWC	320-41679-1	OFFSITE_RW	SITE 00001	NAWC-RW-179	Domestic well	2717007.724	324452.4797	N6247016D9008	WE04	TETRA TECH, INC.	NAWC-073118-RW-179	Ground water	Normal (Regular)	31-Jul-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	WARMINSTER_NAWC	320-41679-1	OFFSITE_RW	SITE 00001	NAWC-RW-185	Domestic well	2709954.782	336947.8683	N6247016D9008	WE04	TETRA TECH, INC.	NAWC-073118-RW-185	Ground water	Normal (Regular)	31-Jul-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	WARMINSTER_NAWC	320-41679-1							N6247016D9008	WE04	TETRA TECH, INC.	NAWC-073118-FRB-185	Water for QC samples	Field Reagent Blank	31-Jul-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	WARMINSTER_NAWC	320-41679-1	OFFSITE_RW	SITE 00001	NAWC-RW-154	Domestic well	2726931.352	325594.6803	N6247016D9008	WE04	TETRA TECH, INC.	NAWC-073118-RW-154	Ground water	Normal (Regular)	31-Jul-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	WARMINSTER_NAWC	320-41679-1							N6247016D9008	WE04	TETRA TECH, INC.	NAWC-073118-FRB-179	Water for QC samples	Field Reagent Blank	31-Jul-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	WARMINSTER_NAWC	320-41679-1	OFFSITE_RW	SITE 00001	NAWC-RW-124	Domestic well	2713671.234	333861.4947	N6247016D9008	WE04	TETRA TECH, INC.	NAWC-073118-RW-124	Ground water	Normal (Regular)	31-Jul-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	WARMINSTER_NAWC	320-41679-1							N6247016D9008	WE04	TETRA TECH, INC.	NAWC-073118-FRB-154	Water for QC samples	Field Reagent Blank	31-Jul-18	537	Perfluoroalkyl Compounds