



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

*Naval Air Station Willow Grove  
Willow Grove, Pennsylvania*

August 2019

N00158\_000717  
WILLOW\_GROVE\_NAS  
SSIC 5000-33c

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

11/20/2017  
TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

## ANALYTICAL REPORT

Job Number: 320-33018-1

Job Description: Warminster: PFAS, NAS JRB Willow Grove

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



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

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11/20/2017

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# Definitions/Glossary

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

TestAmerica Job ID: 320-33018-1

## 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.                                                         |
| Q         | One or more quality control criteria failed.                                        |

## 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**  
**320-33018-1**

**Receipt**

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

**Receipt Exceptions**

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

**LCMS**

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

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

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

**Organic Prep**

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

# Detection Summary

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

TestAmerica Job ID: 320-33018-1

## Client Sample ID: NAWC-110217-RW-286

## Lab Sample ID: 320-33018-1

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

## Client Sample ID: NAWC-110217-FRB-286

## Lab Sample ID: 320-33018-2

No Detections.

## Client Sample ID: WGNA-110217-RW-3978

## Lab Sample ID: 320-33018-3

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

## Client Sample ID: WGNA-110217-FRB-3978

## Lab Sample ID: 320-33018-4

No Detections.

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

## Lab Sample ID: 320-33018-5

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

## Client Sample ID: NAWC-110217-FRB-177-IRR

## Lab Sample ID: 320-33018-6

No Detections.

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

## Lab Sample ID: 320-33018-7

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

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

## Lab Sample ID: 320-33018-8

No Detections.

## Client Sample ID: NAWC-110217-RW-185

## Lab Sample ID: 320-33018-9

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

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento



# Detection Summary

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

TestAmerica Job ID: 320-33018-1

## Client Sample ID: NAWC-110217-RW-185 (Continued)

Lab Sample ID: 320-33018-9

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

## Client Sample ID: NAWC-110217-FRB-185

Lab Sample ID: 320-33018-10

No Detections.

## Client Sample ID: NAWC-110217-RW-355

Lab Sample ID: 320-33018-11

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

## Client Sample ID: NAWC-110217-FRB-355

Lab Sample ID: 320-33018-12

No Detections.

## Client Sample ID: NAWC-110217-RW-348

Lab Sample ID: 320-33018-13

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

## Client Sample ID: NAWC-110217-FRB-348

Lab Sample ID: 320-33018-14

No Detections.

## Client Sample ID: WGNA-110217-RW-3882

Lab Sample ID: 320-33018-15

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

## Client Sample ID: WGNA-110217-FRB-3882

Lab Sample ID: 320-33018-16

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

# Client Sample Results

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

TestAmerica Job ID: 320-33018-1

**Client Sample ID: NAWC-110217-RW-286**

**Date Collected: 11/02/17 08:10**

**Date Received: 11/03/17 09:40**

**Lab Sample ID: 320-33018-1**

**Matrix: Water**

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

| Analyte                              | Result    | Qualifier | LOQ      | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|--------------------------------------|-----------|-----------|----------|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS)  | 21        | J M       | 41       | 7.0 | ng/L | — | 11/08/17 11:47 | 11/13/17 03:05 | 1       |
| Perfluorooctanoic acid (PFOA)        | 16        | J         | 21       | 2.9 | ng/L |   | 11/08/17 11:47 | 11/13/17 03:05 | 1       |
| Perfluorononanoic acid (PFNA)        | 21        | U M       | 25       | 8.3 | ng/L |   | 11/08/17 11:47 | 11/13/17 03:05 | 1       |
| Perfluorohexanesulfonic acid (PFHxS) | 6.5       | J         | 31       | 5.7 | ng/L |   | 11/08/17 11:47 | 11/13/17 03:05 | 1       |
| Perfluoroheptanoic acid (PFHpA)      | 3.9       | J         | 10       | 2.0 | ng/L |   | 11/08/17 11:47 | 11/13/17 03:05 | 1       |
| Perfluorobutanesulfonic acid (PFBS)  | 37        | U         | 93       | 17  | ng/L |   | 11/08/17 11:47 | 11/13/17 03:05 | 1       |
| Surrogate                            | %Recovery | Qualifier | Limits   |     |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C2 PFHxA                           | 84        |           | 70 - 130 |     |      |   | 11/08/17 11:47 | 11/13/17 03:05 | 1       |
| 13C2 PFDA                            | 79        |           | 70 - 130 |     |      |   | 11/08/17 11:47 | 11/13/17 03:05 | 1       |

**Client Sample ID: NAWC-110217-FRB-286**

**Date Collected: 11/02/17 08:05**

**Date Received: 11/03/17 09:40**

**Lab Sample ID: 320-33018-2**

**Matrix: Water**

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

| Analyte                              | Result    | Qualifier | LOQ      | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|--------------------------------------|-----------|-----------|----------|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS)  | 16        | U         | 41       | 7.0 | ng/L | — | 11/08/17 11:47 | 11/13/17 03:09 | 1       |
| Perfluorooctanoic acid (PFOA)        | 8.2       | U         | 21       | 2.9 | ng/L |   | 11/08/17 11:47 | 11/13/17 03:09 | 1       |
| Perfluorononanoic acid (PFNA)        | 21        | U         | 25       | 8.2 | ng/L |   | 11/08/17 11:47 | 11/13/17 03:09 | 1       |
| Perfluorohexanesulfonic acid (PFHxS) | 12        | U         | 31       | 5.6 | ng/L |   | 11/08/17 11:47 | 11/13/17 03:09 | 1       |
| Perfluoroheptanoic acid (PFHpA)      | 4.1       | U         | 10       | 1.9 | ng/L |   | 11/08/17 11:47 | 11/13/17 03:09 | 1       |
| Perfluorobutanesulfonic acid (PFBS)  | 37        | U         | 92       | 17  | ng/L |   | 11/08/17 11:47 | 11/13/17 03:09 | 1       |
| Surrogate                            | %Recovery | Qualifier | Limits   |     |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C2 PFHxA                           | 84        |           | 70 - 130 |     |      |   | 11/08/17 11:47 | 11/13/17 03:09 | 1       |
| 13C2 PFDA                            | 85        |           | 70 - 130 |     |      |   | 11/08/17 11:47 | 11/13/17 03:09 | 1       |

**Client Sample ID: WGNA-110217-RW-3978**

**Date Collected: 11/02/17 08:40**

**Date Received: 11/03/17 09:40**

**Lab Sample ID: 320-33018-3**

**Matrix: Water**

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

| Analyte                              | Result    | Qualifier | LOQ      | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|--------------------------------------|-----------|-----------|----------|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS)  | 22        | J M       | 41       | 6.9 | ng/L | — | 11/08/17 11:47 | 11/13/17 03:14 | 1       |
| Perfluorooctanoic acid (PFOA)        | 14        | J         | 20       | 2.8 | ng/L |   | 11/08/17 11:47 | 11/13/17 03:14 | 1       |
| Perfluorononanoic acid (PFNA)        | 20        | U M       | 24       | 8.1 | ng/L |   | 11/08/17 11:47 | 11/13/17 03:14 | 1       |
| Perfluorohexanesulfonic acid (PFHxS) | 8.3       | J         | 31       | 5.6 | ng/L |   | 11/08/17 11:47 | 11/13/17 03:14 | 1       |
| Perfluoroheptanoic acid (PFHpA)      | 6.5       | J         | 10       | 1.9 | ng/L |   | 11/08/17 11:47 | 11/13/17 03:14 | 1       |
| Perfluorobutanesulfonic acid (PFBS)  | 37        | U         | 92       | 16  | ng/L |   | 11/08/17 11:47 | 11/13/17 03:14 | 1       |
| Surrogate                            | %Recovery | Qualifier | Limits   |     |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C2 PFHxA                           | 78        |           | 70 - 130 |     |      |   | 11/08/17 11:47 | 11/13/17 03:14 | 1       |
| 13C2 PFDA                            | 85        |           | 70 - 130 |     |      |   | 11/08/17 11:47 | 11/13/17 03:14 | 1       |

TestAmerica Sacramento

# Client Sample Results

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

TestAmerica Job ID: 320-33018-1

**Client Sample ID: WGNA-110217-FRB-3978**

**Lab Sample ID: 320-33018-4**

**Date Collected: 11/02/17 08:35**

**Matrix: Water**

**Date Received: 11/03/17 09:40**

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

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

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

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

**Lab Sample ID: 320-33018-5**

**Date Collected: 11/02/17 09:10**

**Matrix: Water**

**Date Received: 11/03/17 09:40**

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

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

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

**Client Sample ID: NAWC-110217-FRB-177-IRR**

**Lab Sample ID: 320-33018-6**

**Date Collected: 11/02/17 09:05**

**Matrix: Water**

**Date Received: 11/03/17 09:40**

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

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

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

TestAmerica Sacramento

# Client Sample Results

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

TestAmerica Job ID: 320-33018-1

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

**Lab Sample ID: 320-33018-7**

**Date Collected: 11/02/17 09:20**

**Matrix: Water**

**Date Received: 11/03/17 09:40**

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

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

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

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

**Lab Sample ID: 320-33018-8**

**Date Collected: 11/02/17 09:15**

**Matrix: Water**

**Date Received: 11/03/17 09:40**

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

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

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

**Client Sample ID: NAWC-110217-RW-185**

**Lab Sample ID: 320-33018-9**

**Date Collected: 11/02/17 10:10**

**Matrix: Water**

**Date Received: 11/03/17 09:40**

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

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

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

TestAmerica Sacramento

# Client Sample Results

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

TestAmerica Job ID: 320-33018-1

**Client Sample ID: NAWC-110217-FRB-185**

**Lab Sample ID: 320-33018-10**

**Date Collected: 11/02/17 10:05**

**Matrix: Water**

**Date Received: 11/03/17 09:40**

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

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

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

**Client Sample ID: NAWC-110217-RW-355**

**Lab Sample ID: 320-33018-11**

**Date Collected: 11/02/17 10:40**

**Matrix: Water**

**Date Received: 11/03/17 09:40**

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

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

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

**Client Sample ID: NAWC-110217-FRB-355**

**Lab Sample ID: 320-33018-12**

**Date Collected: 11/02/17 10:35**

**Matrix: Water**

**Date Received: 11/03/17 09:40**

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

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

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

# Client Sample Results

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

TestAmerica Job ID: 320-33018-1

**Client Sample ID: NAWC-110217-RW-348**

**Lab Sample ID: 320-33018-13**

**Date Collected: 11/02/17 11:40**

**Matrix: Water**

**Date Received: 11/03/17 09:40**

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

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

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

**Client Sample ID: NAWC-110217-FRB-348**

**Lab Sample ID: 320-33018-14**

**Date Collected: 11/02/17 11:35**

**Matrix: Water**

**Date Received: 11/03/17 09:40**

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

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

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

**Client Sample ID: WGNA-110217-RW-3882**

**Lab Sample ID: 320-33018-15**

**Date Collected: 11/02/17 15:40**

**Matrix: Water**

**Date Received: 11/03/17 09:40**

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

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

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

TestAmerica Sacramento

# Client Sample Results

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

TestAmerica Job ID: 320-33018-1

**Client Sample ID: WGNA-110217-FRB-3882**

**Lab Sample ID: 320-33018-16**

**Date Collected: 11/02/17 15:35**

**Matrix: Water**

**Date Received: 11/03/17 09:40**

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

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

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

## Default Detection Limits

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-33018-1

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

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

#### Prep: 537

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



# Surrogate Summary

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

TestAmerica Job ID: 320-33018-1

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

Matrix: Water

Prep Type: Total/NA

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

### Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

# QC Sample Results

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

TestAmerica Job ID: 320-33018-1

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

Lab Sample ID: MB 320-193512/1-A

Matrix: Water

Analysis Batch: 194241

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 193512

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

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

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

Matrix: Water

Analysis Batch: 194241

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 193512

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

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

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

Matrix: Water

Analysis Batch: 194241

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 193512

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

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

TestAmerica Sacramento

# QC Association Summary

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

TestAmerica Job ID: 320-33018-1

## LCMS

### Prep Batch: 193512

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

### Analysis Batch: 194241

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

### Analysis Batch: 194251

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

# Lab Chronicle

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

TestAmerica Job ID: 320-33018-1

## Client Sample ID: NAWC-110217-RW-286

Date Collected: 11/02/17 08:10

Date Received: 11/03/17 09:40

## Lab Sample ID: 320-33018-1

Matrix: Water

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

## Client Sample ID: NAWC-110217-FRB-286

Date Collected: 11/02/17 08:05

Date Received: 11/03/17 09:40

## Lab Sample ID: 320-33018-2

Matrix: Water

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

## Client Sample ID: WGNA-110217-RW-3978

Date Collected: 11/02/17 08:40

Date Received: 11/03/17 09:40

## Lab Sample ID: 320-33018-3

Matrix: Water

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

## Client Sample ID: WGNA-110217-FRB-3978

Date Collected: 11/02/17 08:35

Date Received: 11/03/17 09:40

## Lab Sample ID: 320-33018-4

Matrix: Water

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

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

Date Collected: 11/02/17 09:10

Date Received: 11/03/17 09:40

## Lab Sample ID: 320-33018-5

Matrix: Water

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

## Client Sample ID: NAWC-110217-FRB-177-IRR

Date Collected: 11/02/17 09:05

Date Received: 11/03/17 09:40

## Lab Sample ID: 320-33018-6

Matrix: Water

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

TestAmerica Sacramento

# Lab Chronicle

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

TestAmerica Job ID: 320-33018-1

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

**Date Collected: 11/02/17 09:20**

**Date Received: 11/03/17 09:40**

**Lab Sample ID: 320-33018-7**

**Matrix: Water**

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

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

**Date Collected: 11/02/17 09:15**

**Date Received: 11/03/17 09:40**

**Lab Sample ID: 320-33018-8**

**Matrix: Water**

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

**Client Sample ID: NAWC-110217-RW-185**

**Date Collected: 11/02/17 10:10**

**Date Received: 11/03/17 09:40**

**Lab Sample ID: 320-33018-9**

**Matrix: Water**

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

**Client Sample ID: NAWC-110217-FRB-185**

**Date Collected: 11/02/17 10:05**

**Date Received: 11/03/17 09:40**

**Lab Sample ID: 320-33018-10**

**Matrix: Water**

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

**Client Sample ID: NAWC-110217-RW-355**

**Date Collected: 11/02/17 10:40**

**Date Received: 11/03/17 09:40**

**Lab Sample ID: 320-33018-11**

**Matrix: Water**

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

**Client Sample ID: NAWC-110217-FRB-355**

**Date Collected: 11/02/17 10:35**

**Date Received: 11/03/17 09:40**

**Lab Sample ID: 320-33018-12**

**Matrix: Water**

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

TestAmerica Sacramento

# Lab Chronicle

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

TestAmerica Job ID: 320-33018-1

**Client Sample ID: NAWC-110217-RW-348**

**Date Collected: 11/02/17 11:40**

**Date Received: 11/03/17 09:40**

**Lab Sample ID: 320-33018-13**

**Matrix: Water**

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

**Client Sample ID: NAWC-110217-FRB-348**

**Date Collected: 11/02/17 11:35**

**Date Received: 11/03/17 09:40**

**Lab Sample ID: 320-33018-14**

**Matrix: Water**

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

**Client Sample ID: WGNA-110217-RW-3882**

**Date Collected: 11/02/17 15:40**

**Date Received: 11/03/17 09:40**

**Lab Sample ID: 320-33018-15**

**Matrix: Water**

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

**Client Sample ID: WGNA-110217-FRB-3882**

**Date Collected: 11/02/17 15:35**

**Date Received: 11/03/17 09:40**

**Lab Sample ID: 320-33018-16**

**Matrix: Water**

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

## Laboratory References:

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

# Accreditation/Certification Summary

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

TestAmerica Job ID: 320-33018-1

## Laboratory: TestAmerica Sacramento

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

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

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

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

# Method Summary

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

TestAmerica Job ID: 320-33018-1

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

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

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



## Sample Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-33018-1

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

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

## LCMS MANUAL INTEGRATION SUMMARY

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

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Analysis Batch Number: 192908Lab Sample ID: IC 320-192908/4 Client Sample ID: \_\_\_\_\_Date Analyzed: 11/03/17 13:37 Lab File ID: 2017.11.03\_537XICAL\_004.d GC Column: GeminiC18 3x1 ID: 3 (mm)

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

Lab Sample ID: IC 320-192908/5 Client Sample ID: \_\_\_\_\_Date Analyzed: 11/03/17 13:42 Lab File ID: 2017.11.03\_537XICAL\_005.d GC Column: GeminiC18 3x1 ID: 3 (mm)

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

Lab Sample ID: IC 320-192908/7 ICISAV Client Sample ID: \_\_\_\_\_Date Analyzed: 11/03/17 13:52 Lab File ID: 2017.11.03\_537XICAL\_007.d GC Column: GeminiC18 3x1 ID: 3 (mm)

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

## LCMS MANUAL INTEGRATION SUMMARY

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

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Analysis Batch Number: 194241Lab Sample ID: CCVL 320-194241/1 Client Sample ID: \_\_\_\_\_Date Analyzed: 11/13/17 02:37 Lab File ID: 2017.11.13\_537A\_004.d GC Column: GeminiC18 3x1 ID: 3 (mm)

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

Lab Sample ID: CCV 320-194241/2 CCVIS Client Sample ID: \_\_\_\_\_Date Analyzed: 11/13/17 02:41 Lab File ID: 2017.11.13\_537A\_005.d GC Column: GeminiC18 3x1 ID: 3 (mm)

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

Lab Sample ID: LCS 320-193512/2-A Client Sample ID: \_\_\_\_\_Date Analyzed: 11/13/17 02:55 Lab File ID: 2017.11.13\_537A\_008.d GC Column: GeminiC18 3x1 ID: 3 (mm)

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

Lab Sample ID: LCSD 320-193512/3-A Client Sample ID: \_\_\_\_\_Date Analyzed: 11/13/17 03:00 Lab File ID: 2017.11.13\_537A\_009.d GC Column: GeminiC18 3x1 ID: 3 (mm)

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

## LCMS MANUAL INTEGRATION SUMMARY

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

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Analysis Batch Number: 194241Lab Sample ID: 320-33018-1 Client Sample ID: NAWC-110217-RW-286Date Analyzed: 11/13/17 03:05 Lab File ID: 2017.11.13\_537A\_010.d GC Column: GeminiC18 3x1 ID: 3(mm)

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

Lab Sample ID: 320-33018-3 Client Sample ID: WGNA-110217-RW-3978Date Analyzed: 11/13/17 03:14 Lab File ID: 2017.11.13\_537A\_012.d GC Column: GeminiC18 3x1 ID: 3(mm)

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

Lab Sample ID: 320-33018-5 Client Sample ID: NAWC-110217-RW-177-IRRDate Analyzed: 11/13/17 03:24 Lab File ID: 2017.11.13\_537A\_014.d GC Column: GeminiC18 3x1 ID: 3(mm)

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

Lab Sample ID: 320-33018-7 Client Sample ID: NAWC-110217-RW-177-SHOPDate Analyzed: 11/13/17 03:33 Lab File ID: 2017.11.13\_537A\_016.d GC Column: GeminiC18 3x1 ID: 3(mm)

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

## LCMS MANUAL INTEGRATION SUMMARY

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

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Analysis Batch Number: 194241Lab Sample ID: CCV 320-194241/14 CCVIS Client Sample ID: \_\_\_\_\_Date Analyzed: 11/13/17 03:38 Lab File ID: 2017.11.13\_537A\_017.d GC Column: GeminiC18 3x1 ID: 3 (mm)

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

## LCMS MANUAL INTEGRATION SUMMARY

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

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Analysis Batch Number: 194251Lab Sample ID: CCV 320-194251/14 CCVIS Client Sample ID: \_\_\_\_\_Date Analyzed: 11/13/17 03:38 Lab File ID: 2017.11.13\_537A\_017.d GC Column: GeminiC18 3x1 ID: 3 (mm)

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

Lab Sample ID: 320-33018-9 Client Sample ID: NAWC-110217-RW-185Date Analyzed: 11/13/17 03:52 Lab File ID: 2017.11.13\_537A\_020.d GC Column: GeminiC18 3x1 ID: 3 (mm)

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

Lab Sample ID: 320-33018-11 Client Sample ID: NAWC-110217-RW-355Date Analyzed: 11/13/17 04:01 Lab File ID: 2017.11.13\_537A\_022.d GC Column: GeminiC18 3x1 ID: 3 (mm)

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

Lab Sample ID: 320-33018-13 Client Sample ID: NAWC-110217-RW-348Date Analyzed: 11/13/17 04:10 Lab File ID: 2017.11.13\_537A\_024.d GC Column: GeminiC18 3x1 ID: 3 (mm)

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

Lab Sample ID: 320-33018-15 Client Sample ID: WGNA-110217-RW-3882Date Analyzed: 11/13/17 04:20 Lab File ID: 2017.11.13\_537A\_026.d GC Column: GeminiC18 3x1 ID: 3 (mm)

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

## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-33018-1

SDG No.: \_\_\_\_\_

| Reagent ID           | Exp Date | Prep Date                               | Dilutant Used        | Reagent Final Volume                | Parent Reagent      |              | Analyte                              | Concentration |                                      |               |
|----------------------|----------|-----------------------------------------|----------------------|-------------------------------------|---------------------|--------------|--------------------------------------|---------------|--------------------------------------|---------------|
|                      |          |                                         |                      |                                     | Reagent ID          | Volume Added |                                      |               |                                      |               |
| LC537-HSP_00023      | 02/10/18 | 08/10/17                                | Methanol, Lot 141039 | 20000 uL                            | LC537SPIM_00023     | 277.8 uL     | Perfluorobutane Sulfonate            | 1250.1 ng/mL  |                                      |               |
|                      |          |                                         |                      |                                     |                     |              | Perfluorobutanesulfonic acid (PFBS)  | 1250.1 ng/mL  |                                      |               |
|                      |          |                                         |                      |                                     |                     |              | Perfluoroheptanoic acid (PFHpA)      | 138.923 ng/mL |                                      |               |
|                      |          |                                         |                      |                                     |                     |              | Perfluorohexanesulfonic acid (PFHxS) | 416.76 ng/mL  |                                      |               |
|                      |          |                                         |                      |                                     |                     |              | Perfluorononanoic acid (PFNA)        | 277.827 ng/mL |                                      |               |
|                      |          |                                         |                      |                                     |                     |              | Perfluorooctanoic acid (PFOA)        | 278.01 ng/mL  |                                      |               |
|                      |          |                                         |                      |                                     |                     |              | Perfluorooctanesulfonic acid (PFOS)  | 555.691 ng/mL |                                      |               |
| .LC537SPIM_00023     | 02/10/18 | 08/10/17                                | Methanol, Lot 104453 | 10000 uL                            | LC537-PFBS_00008    | 450 uL       | Perfluorobutane Sulfonate            | 90 ug/mL      |                                      |               |
|                      |          |                                         |                      |                                     |                     |              | Perfluorobutanesulfonic acid (PFBS)  | 90 ug/mL      |                                      |               |
|                      |          |                                         |                      |                                     |                     |              | LC537-PFHpA_00015                    | 100 uL        | Perfluoroheptanoic acid (PFHpA)      | 10.0016 ug/mL |
|                      |          |                                         |                      |                                     |                     |              | LC537-PFHxS_00010                    | 150 uL        | Perfluorohexanesulfonic acid (PFHxS) | 30.0043 ug/mL |
|                      |          |                                         |                      |                                     |                     |              | LC537-PFNA_00013                     | 200 uL        | Perfluorononanoic acid (PFNA)        | 20.002 ug/mL  |
|                      |          |                                         |                      |                                     |                     |              | LC537-PFOA_00013                     | 200 uL        | Perfluorooctanoic acid (PFOA)        | 20.0151 ug/mL |
|                      |          |                                         |                      |                                     |                     |              | LC537-PFOS_00008                     | 400 uL        | Perfluorooctanesulfonic acid (PFOS)  | 40.0066 ug/mL |
| ..LC537-PFBS_00008   | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 49.6 mL                             | LC537_PFBS_00002    | 0.0992 g     | Perfluorobutane Sulfonate            | 2 mg/mL       |                                      |               |
|                      |          |                                         |                      | Perfluorobutanesulfonic acid (PFBS) |                     |              | 2 mg/mL                              |               |                                      |               |
| ...LC537_PFBS_00002  | 04/01/18 | Sigma, Lot MKBP8842V                    |                      |                                     | (Purchased Reagent) |              | Perfluorobutane Sulfonate            | 1 g/g         |                                      |               |
|                      |          |                                         |                      |                                     |                     |              | Perfluorobutanesulfonic acid (PFBS)  | 1 g/g         |                                      |               |
| ..LC537-PFHpA_00015  | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 48.7 mL                             | LC537_PFHpA_00002   | 0.0492 g     | Perfluoroheptanoic acid (PFHpA)      | 1.00016 mg/mL |                                      |               |
| ...LC537_PFHpA_00002 | 04/01/18 | Aldrich, Lot BCBM2579V                  |                      |                                     | (Purchased Reagent) |              | Perfluoroheptanoic acid (PFHpA)      | 0.99 g/g      |                                      |               |
| ..LC537-PFHxS_00010  | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 55.92 mL                            | LC537_PFHxS_00002   | 0.123 g      | Perfluorohexanesulfonic acid (PFHxS) | 2.00029 mg/mL |                                      |               |
| ...LC537_PFHxS_00002 | 04/01/18 | Sigma, Lot BCBL3545V                    |                      |                                     | (Purchased Reagent) |              | Perfluorohexanesulfonic acid (PFHxS) | 0.9094 g/g    |                                      |               |
| ..LC537-PFNA_00013   | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 62.3 mL                             | LC537_PFNA_00002    | 0.0647 g     | Perfluorononanoic acid (PFNA)        | 1000.1 ug/mL  |                                      |               |
| ...LC537_PFNA_00002  | 04/01/18 | TCI America, Lot QN44F                  |                      |                                     | (Purchased Reagent) |              | Perfluorononanoic acid (PFNA)        | 0.963 g/g     |                                      |               |
| ..LC537-PFOA_00013   | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 22.76 mL                            | LC537_PFOA_00003    | 0.0228 g     | Perfluorooctanoic acid (PFOA)        | 1.00076 mg/mL |                                      |               |
| ...LC537_PFOA_00003  | 10/31/23 | SIGMA ALDRICH, Lot BCBS1198V            |                      |                                     | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)        | 0.999 g/g     |                                      |               |
| ..LC537-PFOS_00008   | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 44.43 mL                            | LC537_PFOS_00003    | 0.0488 g     | Perfluorooctanesulfonic acid (PFOS)  | 1.00016 mg/mL |                                      |               |
| ...LC537_PFOS_00003  | 04/17/19 | sigma alrich, Lot SZBE107XV             |                      |                                     | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS)  | 0.9106 g/g    |                                      |               |
| LC537-ICV_00028      | 01/05/18 | 08/02/17                                | MeOH/H2O, Lot 067374 | 10 mL                               | LC537-IS_00045      | 1000 uL      | 13C2-PFOA                            | 10 ng/mL      |                                      |               |
|                      |          |                                         |                      |                                     |                     |              | 13C4 PFOS                            | 28.68 ng/mL   |                                      |               |
| .LC537-IS_00045      | 01/05/18 | 07/05/17                                | Methanol, Lot 090285 | 30000 uL                            | LCM2PFOA_00007      | 60 uL        | 13C2-PFOA                            | 0.1 ug/mL     |                                      |               |
|                      |          |                                         |                      |                                     | LCMPFOS_00019       | 180 uL       | 13C4 PFOS                            | 0.2868 ug/mL  |                                      |               |
| ..LCM2PFOA_00007     | 02/12/21 | Wellington Laboratories, Lot M2PFOA0216 |                      |                                     | (Purchased Reagent) |              | 13C2-PFOA                            | 50 ug/mL      |                                      |               |

## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-33018-1

SDG No.:

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



## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-33018-1

SDG No.: \_\_\_\_\_

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-33018-1

SDG No.: \_\_\_\_\_

| Reagent ID            | Exp Date | Prep Date                               | Dilutant Used        | Reagent Final Volume | Parent Reagent      |              | Analyte                              | Concentration |
|-----------------------|----------|-----------------------------------------|----------------------|----------------------|---------------------|--------------|--------------------------------------|---------------|
|                       |          |                                         |                      |                      | Reagent ID          | Volume Added |                                      |               |
| ...LC537-PFHxS_00010  | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 55.92 mL             | LC537_PFHxS_00002   | 0.123 g      | Perfluorohexanesulfonic acid (PFHxS) | 2.00029 mg/mL |
| ....LC537_PFHxS_00002 | 04/01/18 | Sigma, Lot BCBL3545V                    |                      |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid (PFHxS) | 0.9094 g/g    |
| ...LC537-PFNA_00013   | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 62.3 mL              | LC537 PFNA_00002    | 0.0647 g     | Perfluorononanoic acid (PFNA)        | 1000.1 ug/mL  |
| ....LC537 PFNA_00002  | 04/01/18 | TCI America, Lot QN44F                  |                      |                      | (Purchased Reagent) |              | Perfluorononanoic acid (PFNA)        | 0.963 g/g     |
| ...LC537-PFOA_00013   | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 22.76 mL             | LC537 PFOA_00003    | 0.0228 g     | Perfluorooctanoic acid (PFOA)        | 1.00076 mg/mL |
| ....LC537 PFOA_00003  | 10/31/23 | SIGMA ALDRICH, Lot BCBS1198V            |                      |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)        | 0.999 g/g     |
| ...LC537-PFOS_00008   | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 44.43 mL             | LC537_PFOS_00003    | 0.0488 g     | Perfluorooctanesulfonic acid (PFOS)  | 1.00016 mg/mL |
| ....LC537_PFOS_00003  | 04/17/19 | sigma alrich, Lot SZBE107XV             |                      |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS)  | 0.9106 g/g    |
| .LC537-SU_00049       | 02/04/18 | 08/04/17                                | Methanol, Lot 104453 | 30000 uL             | LCMPFDA_00012       | 60 uL        | 13C2 PFDA                            | 0.1 ug/mL     |
|                       |          |                                         |                      |                      | LCMPFHxA_00013      | 60 uL        | 13C2 PFHxA                           | 0.1 ug/mL     |
| ..LCMPFDA_00012       | 09/30/21 | Wellington Laboratories, Lot MPFDA0916  |                      |                      | (Purchased Reagent) |              | 13C2 PFDA                            | 50 ug/mL      |
| ..LCMPFHxA_00013      | 04/08/21 | Wellington Laboratories, Lot MPFHxA0416 |                      |                      | (Purchased Reagent) |              | 13C2 PFHxA                           | 50 ug/mL      |
| <b>LC537-L2_00020</b> | 02/04/18 | 08/14/17                                | MeOH/H2O, Lot 090285 | 5 mL                 | LC537-HSP_00025     | 80 uL        | Perfluorobutanesulfonic acid (PFBS)  | 20.0016 ng/mL |
|                       |          |                                         |                      |                      |                     |              | Perfluoroheptanoic acid (PFHpA)      | 2.22277 ng/mL |
|                       |          |                                         |                      |                      |                     |              | Perfluorohexanesulfonic acid (PFHxS) | 6.66817 ng/mL |
|                       |          |                                         |                      |                      |                     |              | Perfluorononanoic acid (PFNA)        | 4.44524 ng/mL |
|                       |          |                                         |                      |                      |                     |              | Perfluorooctanoic acid (PFOA)        | 4.44816 ng/mL |
|                       |          |                                         |                      |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)  | 8.89106 ng/mL |
|                       |          |                                         |                      |                      | LC537-IS_00048      | 500 uL       | 13C2-PFOA                            | 10 ng/mL      |
|                       |          |                                         |                      |                      |                     |              | 13C4 PFOS                            | 28.68 ng/mL   |
|                       |          |                                         |                      |                      | LC537-SU_00049      | 500 uL       | 13C2 PFDA                            | 10 ng/mL      |
|                       |          |                                         |                      |                      |                     |              | 13C2 PFHxA                           | 10 ng/mL      |
| .LC537-HSP_00025      | 02/10/18 | 08/10/17                                | Methanol, Lot 141039 | 20000 uL             | LC537SPIM_00023     | 277.8 uL     | Perfluorobutanesulfonic acid (PFBS)  | 1250.1 ng/mL  |
|                       |          |                                         |                      |                      |                     |              | Perfluoroheptanoic acid (PFHpA)      | 138.923 ng/mL |
|                       |          |                                         |                      |                      |                     |              | Perfluorohexanesulfonic acid (PFHxS) | 416.76 ng/mL  |
|                       |          |                                         |                      |                      |                     |              | Perfluorononanoic acid (PFNA)        | 277.827 ng/mL |
|                       |          |                                         |                      |                      |                     |              | Perfluorooctanoic acid (PFOA)        | 278.01 ng/mL  |
|                       |          |                                         |                      |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)  | 555.691 ng/mL |
| ..LC537SPIM_00023     | 02/10/18 | 08/10/17                                | Methanol, Lot 104453 | 10000 uL             | LC537-PFBS_00008    | 450 uL       | Perfluorobutanesulfonic acid (PFBS)  | 90 ug/mL      |
|                       |          |                                         |                      |                      | LC537-PFHpA_00015   | 100 uL       | Perfluoroheptanoic acid (PFHpA)      | 10.0016 ug/mL |
|                       |          |                                         |                      |                      | LC537-PFHxS_00010   | 150 uL       | Perfluorohexanesulfonic acid (PFHxS) | 30.0043 ug/mL |
|                       |          |                                         |                      |                      | LC537-PFNA_00013    | 200 uL       | Perfluorononanoic acid (PFNA)        | 20.002 ug/mL  |
|                       |          |                                         |                      |                      | LC537-PFOA_00013    | 200 uL       | Perfluorooctanoic acid (PFOA)        | 20.0151 ug/mL |

# REAGENT TRACEABILITY SUMMARY

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

SDG No.: \_\_\_\_\_

| Reagent ID            | Exp Date | Prep Date                               | Dilutant Used        | Reagent Final Volume | Parent Reagent      |              | Analyte                              | Concentration |
|-----------------------|----------|-----------------------------------------|----------------------|----------------------|---------------------|--------------|--------------------------------------|---------------|
|                       |          |                                         |                      |                      | Reagent ID          | Volume Added |                                      |               |
|                       |          |                                         |                      |                      | LC537-PFOS_00008    | 400 uL       | Perfluorooctanesulfonic acid (PFOS)  | 40.0066 ug/mL |
| ...LC537-PFBS_00008   | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 49.6 mL              | LC537_PFBS_00002    | 0.0992 g     | Perfluorobutanesulfonic acid (PFBS)  | 2 mg/mL       |
| ....LC537_PFBS_00002  | 04/01/18 | Sigma, Lot MKBP8842V                    |                      |                      | (Purchased Reagent) |              | Perfluorobutanesulfonic acid (PFBS)  | 1 g/g         |
| ...LC537-PFHpA_00015  | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 48.7 mL              | LC537_PFHpA_00002   | 0.0492 g     | Perfluoroheptanoic acid (PFHpA)      | 1.00016 mg/mL |
| ....LC537_PFHpA_00002 | 04/01/18 | Aldrich, Lot BCBM2579V                  |                      |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid (PFHpA)      | 0.99 g/g      |
| ...LC537-PFHxS_00010  | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 55.92 mL             | LC537_PFHxS_00002   | 0.123 g      | Perfluorohexanesulfonic acid (PFHxS) | 2.00029 mg/mL |
| ....LC537_PFHxS_00002 | 04/01/18 | Sigma, Lot BCBL3545V                    |                      |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid (PFHxS) | 0.9094 g/g    |
| ...LC537-PFNA_00013   | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 62.3 mL              | LC537 PFNA_00002    | 0.0647 g     | Perfluorononanoic acid (PFNA)        | 1000.1 ug/mL  |
| ....LC537 PFNA_00002  | 04/01/18 | TCI America, Lot QN44F                  |                      |                      | (Purchased Reagent) |              | Perfluorononanoic acid (PFNA)        | 0.963 g/g     |
| ...LC537-PFOA_00013   | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 22.76 mL             | LC537_PFOA_00003    | 0.0228 g     | Perfluorooctanoic acid (PFOA)        | 1.00076 mg/mL |
| ....LC537_PFOA_00003  | 10/31/23 | SIGMA ALDRICH, Lot BCBS1198V            |                      |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)        | 0.999 g/g     |
| ...LC537-PFOS_00008   | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 44.43 mL             | LC537_PFOS_00003    | 0.0488 g     | Perfluorooctanesulfonic acid (PFOS)  | 1.00016 mg/mL |
| ....LC537_PFOS_00003  | 04/17/19 | sigma alrich, Lot SZBE107XV             |                      |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS)  | 0.9106 g/g    |
| .LC537-IS_00048       | 02/04/18 | 08/04/17                                | Methanol, Lot 090285 | 30000 uL             | LCM2PFOA_00007      | 60 uL        | 13C2-PFOA                            | 0.1 ug/mL     |
| ..LCM2PFOA_00007      | 02/12/21 | Wellington Laboratories, Lot M2PFOA0216 |                      |                      | (Purchased Reagent) |              | 13C2-PFOA                            | 50 ug/mL      |
| ..LCMPFOS_00021       | 12/12/21 | Wellington Laboratories, Lot MPFOS1216  |                      |                      | (Purchased Reagent) |              | 13C4 PFOS                            | 47.8 ug/mL    |
| .LC537-SU_00049       | 02/04/18 | 08/04/17                                | Methanol, Lot 104453 | 30000 uL             | LCMPFDA_00012       | 60 uL        | 13C2 PFDA                            | 0.1 ug/mL     |
| ..LCMPFDA_00012       | 09/30/21 | Wellington Laboratories, Lot MPFDA0916  |                      |                      | (Purchased Reagent) |              | 13C2 PFDA                            | 50 ug/mL      |
| ..LCMPFHxA_00013      | 04/08/21 | Wellington Laboratories, Lot MPFHxA0416 |                      |                      | (Purchased Reagent) |              | 13C2 PFHxA                           | 50 ug/mL      |
| <b>LC537-L3_00023</b> | 02/04/18 | 08/14/17                                | MeOH/H2O, Lot 090285 | 5 mL                 | LC537-HSP_00025     | 180 uL       | Perfluorobutanesulfonic acid (PFBS)  | 45.0036 ng/mL |
|                       |          |                                         |                      |                      |                     |              | Perfluoroheptanoic acid (PFHpA)      | 5.00122 ng/mL |
|                       |          |                                         |                      |                      |                     |              | Perfluorohexanesulfonic acid (PFHxS) | 15.0034 ng/mL |
|                       |          |                                         |                      |                      |                     |              | Perfluorononanoic acid (PFNA)        | 10.0018 ng/mL |
|                       |          |                                         |                      |                      |                     |              | Perfluorooctanoic acid (PFOA)        | 10.0084 ng/mL |
|                       |          |                                         |                      |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)  | 20.0049 ng/mL |
|                       |          |                                         |                      |                      | LC537-IS_00048      | 500 uL       | 13C2-PFOA                            | 10 ng/mL      |
| .LC537-HSP_00025      | 02/10/18 | 08/10/17                                | Methanol, Lot 141039 | 20000 uL             | LC537SPIM_00023     | 277.8 uL     | 13C4 PFOS                            | 28.68 ng/mL   |
|                       |          |                                         |                      |                      |                     |              | 13C2 PFDA                            | 10 ng/mL      |
|                       |          |                                         |                      |                      |                     |              | 13C2 PFHxA                           | 10 ng/mL      |
|                       |          |                                         |                      |                      |                     |              | Perfluorobutanesulfonic acid (PFBS)  | 1250.1 ng/mL  |
|                       |          |                                         |                      |                      |                     |              | Perfluoroheptanoic acid (PFHpA)      | 138.923 ng/mL |

## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-33018-1

SDG No.: \_\_\_\_\_

| Reagent ID            | Exp Date | Prep Date | Dilutant Used                           | Reagent Final Volume | Parent Reagent      |              | Analyte                              | Concentration |
|-----------------------|----------|-----------|-----------------------------------------|----------------------|---------------------|--------------|--------------------------------------|---------------|
|                       |          |           |                                         |                      | Reagent ID          | Volume Added |                                      |               |
|                       |          |           |                                         |                      |                     |              | Perfluorohexanesulfonic acid (PFHxS) | 416.76 ng/mL  |
|                       |          |           |                                         |                      |                     |              | Perfluorononanoic acid (PFNA)        | 277.827 ng/mL |
|                       |          |           |                                         |                      |                     |              | Perfluorooctanoic acid (PFOA)        | 278.01 ng/mL  |
|                       |          |           |                                         |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)  | 555.691 ng/mL |
| ..LC537SPIM_00023     | 02/10/18 | 08/10/17  | Methanol, Lot 104453                    | 10000 uL             | LC537-PFBS_00008    | 450 uL       | Perfluorobutanesulfonic acid (PFBS)  | 90 ug/mL      |
|                       |          |           |                                         |                      | LC537-PFHpA_00015   | 100 uL       | Perfluoroheptanoic acid (PFHpA)      | 10.0016 ug/mL |
|                       |          |           |                                         |                      | LC537-PFHxS_00010   | 150 uL       | Perfluorohexanesulfonic acid (PFHxS) | 30.0043 ug/mL |
|                       |          |           |                                         |                      | LC537-PFNA_00013    | 200 uL       | Perfluorononanoic acid (PFNA)        | 20.002 ug/mL  |
|                       |          |           |                                         |                      | LC537-PFOA_00013    | 200 uL       | Perfluorooctanoic acid (PFOA)        | 20.0151 ug/mL |
|                       |          |           |                                         |                      | LC537-PFOS_00008    | 400 uL       | Perfluorooctanesulfonic acid (PFOS)  | 40.0066 ug/mL |
| ...LC537-PFBS_00008   | 02/10/18 | 08/10/17  | Methanol, Lot 090285                    | 49.6 mL              | LC537_PFBS_00002    | 0.0992 g     | Perfluorobutanesulfonic acid (PFBS)  | 2 mg/mL       |
| ....LC537_PFBS_00002  | 04/01/18 |           | Sigma, Lot MKBP8842V                    |                      | (Purchased Reagent) |              | Perfluorobutanesulfonic acid (PFBS)  | 1 g/g         |
| ...LC537-PFHpA_00015  | 02/10/18 | 08/10/17  | Methanol, Lot 090285                    | 48.7 mL              | LC537_PFHpA_00002   | 0.0492 g     | Perfluoroheptanoic acid (PFHpA)      | 1.00016 mg/mL |
| ....LC537_PFHpA_00002 | 04/01/18 |           | Aldrich, Lot BCBM2579V                  |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid (PFHpA)      | 0.99 g/g      |
| ...LC537-PFHxS_00010  | 02/10/18 | 08/10/17  | Methanol, Lot 090285                    | 55.92 mL             | LC537_PFHxS_00002   | 0.123 g      | Perfluorohexanesulfonic acid (PFHxS) | 2.00029 mg/mL |
| ....LC537_PFHxS_00002 | 04/01/18 |           | Sigma, Lot BCBL3545V                    |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid (PFHxS) | 0.9094 g/g    |
| ...LC537-PFNA_00013   | 02/10/18 | 08/10/17  | Methanol, Lot 090285                    | 62.3 mL              | LC537 PFNA_00002    | 0.0647 g     | Perfluorononanoic acid (PFNA)        | 1000.1 ug/mL  |
| ....LC537 PFNA_00002  | 04/01/18 |           | TCI America, Lot QN44F                  |                      | (Purchased Reagent) |              | Perfluorononanoic acid (PFNA)        | 0.963 g/g     |
| ...LC537-PFOA_00013   | 02/10/18 | 08/10/17  | Methanol, Lot 090285                    | 22.76 mL             | LC537 PFOA_00003    | 0.0228 g     | Perfluorooctanoic acid (PFOA)        | 1.00076 mg/mL |
| ....LC537 PFOA_00003  | 10/31/23 |           | SIGMA ALDRICH, Lot BCBS1198V            |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)        | 0.999 g/g     |
| ...LC537-PFOS_00008   | 02/10/18 | 08/10/17  | Methanol, Lot 090285                    | 44.43 mL             | LC537_PFOS_00003    | 0.0488 g     | Perfluorooctanesulfonic acid (PFOS)  | 1.00016 mg/mL |
| ....LC537_PFOS_00003  | 04/17/19 |           | sigma alrich, Lot SZBE107XV             |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS)  | 0.9106 g/g    |
| .LC537-IS_00048       | 02/04/18 | 08/04/17  | Methanol, Lot 090285                    | 30000 uL             | LCM2PFOA_00007      | 60 uL        | 13C2-PFOA                            | 0.1 ug/mL     |
|                       |          |           |                                         |                      | LCMPFOS_00021       | 180 uL       | 13C4 PFOS                            | 0.2868 ug/mL  |
| ..LCM2PFOA_00007      | 02/12/21 |           | Wellington Laboratories, Lot M2PFOA0216 |                      | (Purchased Reagent) |              | 13C2-PFOA                            | 50 ug/mL      |
| ..LCMPFOS_00021       | 12/12/21 |           | Wellington Laboratories, Lot MPFOS1216  |                      | (Purchased Reagent) |              | 13C4 PFOS                            | 47.8 ug/mL    |
| .LC537-SU_00049       | 02/04/18 | 08/04/17  | Methanol, Lot 104453                    | 30000 uL             | LCMPFDA_00012       | 60 uL        | 13C2 PFDA                            | 0.1 ug/mL     |
|                       |          |           |                                         |                      | LCMPFHxA_00013      | 60 uL        | 13C2 PFHxA                           | 0.1 ug/mL     |
| ..LCMPFDA_00012       | 09/30/21 |           | Wellington Laboratories, Lot MPFDA0916  |                      | (Purchased Reagent) |              | 13C2 PFDA                            | 50 ug/mL      |
| ..LCMPFHxA_00013      | 04/08/21 |           | Wellington Laboratories, Lot MPFHxA0416 |                      | (Purchased Reagent) |              | 13C2 PFHxA                           | 50 ug/mL      |
| <b>LC537-L4_00020</b> | 02/04/18 | 08/14/17  | MeOH/H2O, Lot 090285                    | 5 mL                 | LC537-HSP_00025     | 360 uL       | Perfluorobutanesulfonic acid (PFBS)  | 90.0072 ng/mL |
|                       |          |           |                                         |                      |                     |              | Perfluoroheptanoic acid (PFHpA)      | 10.0024 ng/mL |

## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-33018-1

SDG No.: \_\_\_\_\_

| Reagent ID            | Exp Date | Prep Date                    | Dilutant Used        | Reagent Final Volume | Parent Reagent      |              | Analyte                              | Concentration |
|-----------------------|----------|------------------------------|----------------------|----------------------|---------------------|--------------|--------------------------------------|---------------|
|                       |          |                              |                      |                      | Reagent ID          | Volume Added |                                      |               |
|                       |          |                              |                      |                      |                     |              | Perfluorohexanesulfonic acid (PFHxS) | 30.0067 ng/mL |
|                       |          |                              |                      |                      |                     |              | Perfluorononanoic acid (PFNA)        | 20.0036 ng/mL |
|                       |          |                              |                      |                      |                     |              | Perfluorooctanoic acid (PFOA)        | 20.0167 ng/mL |
|                       |          |                              |                      |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)  | 40.0098 ng/mL |
|                       |          |                              |                      |                      | LC537-IS_00048      | 500 uL       | 13C2-PFOA                            | 10 ng/mL      |
|                       |          |                              |                      |                      | LC537-SU_00049      | 500 uL       | 13C4 PFOS                            | 28.68 ng/mL   |
|                       |          |                              |                      |                      |                     |              | 13C2 PFDA                            | 10 ng/mL      |
| .LC537-HSP_00025      | 02/10/18 | 08/10/17                     | Methanol, Lot 141039 | 20000 uL             | LC537SPIM_00023     | 277.8 uL     | 13C2 PFHxA                           | 10 ng/mL      |
|                       |          |                              |                      |                      |                     |              | Perfluorobutanesulfonic acid (PFBS)  | 1250.1 ng/mL  |
|                       |          |                              |                      |                      |                     |              | Perfluoroheptanoic acid (PFHpA)      | 138.923 ng/mL |
|                       |          |                              |                      |                      |                     |              | Perfluorohexanesulfonic acid (PFHxS) | 416.76 ng/mL  |
|                       |          |                              |                      |                      |                     |              | Perfluorononanoic acid (PFNA)        | 277.827 ng/mL |
|                       |          |                              |                      |                      |                     |              | Perfluorooctanoic acid (PFOA)        | 278.01 ng/mL  |
| ..LC537SPIM_00023     | 02/10/18 | 08/10/17                     | Methanol, Lot 104453 | 10000 uL             | LC537-PFBS_00008    | 450 uL       | Perfluorooctanesulfonic acid (PFOS)  | 555.691 ng/mL |
|                       |          |                              |                      |                      |                     |              | Perfluorobutanesulfonic acid (PFBS)  | 90 ug/mL      |
|                       |          |                              |                      |                      |                     |              | Perfluoroheptanoic acid (PFHpA)      | 10.0016 ug/mL |
|                       |          |                              |                      |                      |                     |              | Perfluorohexanesulfonic acid (PFHxS) | 30.0043 ug/mL |
|                       |          |                              |                      |                      |                     |              | Perfluorononanoic acid (PFNA)        | 20.002 ug/mL  |
|                       |          |                              |                      |                      |                     |              | Perfluorooctanoic acid (PFOA)        | 20.0151 ug/mL |
|                       |          |                              |                      |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)  | 40.0066 ug/mL |
| ...LC537-PFBS_00008   | 02/10/18 | 08/10/17                     | Methanol, Lot 090285 | 49.6 mL              | LC537_PFBS_00002    | 0.0992 g     | Perfluorobutanesulfonic acid (PFBS)  | 2 mg/mL       |
| ....LC537_PFBS_00002  | 04/01/18 | Sigma, Lot MKBP8842V         |                      |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid (PFHpA)      | 1 g/g         |
| ...LC537-PFHpA_00015  | 02/10/18 | 08/10/17                     | Methanol, Lot 090285 | 48.7 mL              | LC537_PFHpA_00002   | 0.0492 g     | Perfluorobutanesulfonic acid (PFBS)  | 1.00016 mg/mL |
| ....LC537_PFHpA_00002 | 04/01/18 | Aldrich, Lot BCBM2579V       |                      |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid (PFHpA)      | 0.99 g/g      |
| ...LC537-PFHxS_00010  | 02/10/18 | 08/10/17                     | Methanol, Lot 090285 | 55.92 mL             | LC537_PFHxS_00002   | 0.123 g      | Perfluorohexanesulfonic acid (PFHxS) | 2.00029 mg/mL |
| ....LC537_PFHxS_00002 | 04/01/18 | Sigma, Lot BCBL3545V         |                      |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid (PFHxS) | 0.9094 g/g    |
| ...LC537-PFNA_00013   | 02/10/18 | 08/10/17                     | Methanol, Lot 090285 | 62.3 mL              | LC537 PFNA_00002    | 0.0647 g     | Perfluorononanoic acid (PFNA)        | 1000.1 ug/mL  |
| ....LC537 PFNA_00002  | 04/01/18 | TCI America, Lot QN44F       |                      |                      | (Purchased Reagent) |              | Perfluorononanoic acid (PFNA)        | 0.963 g/g     |
| ...LC537-PFOA_00013   | 02/10/18 | 08/10/17                     | Methanol, Lot 090285 | 22.76 mL             | LC537 PFOA_00003    | 0.0228 g     | Perfluorooctanoic acid (PFOA)        | 1.00076 mg/mL |
| ....LC537 PFOA_00003  | 10/31/23 | SIGMA ALDRICH, Lot BCBS1198V |                      |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)        | 0.999 g/g     |
| ...LC537-PFOS_00008   | 02/10/18 | 08/10/17                     | Methanol, Lot 090285 | 44.43 mL             | LC537_PFOS_00003    | 0.0488 g     | Perfluorooctanesulfonic acid (PFOS)  | 1.00016 mg/mL |
| ....LC537_PFOS_00003  | 04/17/19 | sigma alrich, Lot SZBE107XV  |                      |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS)  | 0.9106 g/g    |

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-33018-1

SDG No.: \_\_\_\_\_

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

# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-33018-1

SDG No.: \_\_\_\_\_

| Reagent ID            | Exp Date | Prep Date | Dilutant Used                           | Reagent Final Volume | Parent Reagent      |              | Analyte                              | Concentration |
|-----------------------|----------|-----------|-----------------------------------------|----------------------|---------------------|--------------|--------------------------------------|---------------|
|                       |          |           |                                         |                      | Reagent ID          | Volume Added |                                      |               |
| ....LC537_PFHpA_00002 | 04/01/18 |           | Aldrich, Lot BCBM2579V                  |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid (PFHpA)      | 0.99 g/g      |
| ...LC537-PFHxS_00010  | 02/10/18 | 08/10/17  | Methanol, Lot 090285                    | 55.92 mL             | LC537_PFHxS_00002   | 0.123 g      | Perfluorohexanesulfonic acid (PFHxS) | 2.00029 mg/mL |
| ....LC537_PFHxS_00002 | 04/01/18 |           | Sigma, Lot BCBL3545V                    |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid (PFHxS) | 0.9094 g/g    |
| ...LC537-PFNA_00013   | 02/10/18 | 08/10/17  | Methanol, Lot 090285                    | 62.3 mL              | LC537_PFNA_00002    | 0.0647 g     | Perfluorononanoic acid (PFNA)        | 1000.1 ug/mL  |
| ....LC537 PFNA_00002  | 04/01/18 |           | TCI America, Lot QN44F                  |                      | (Purchased Reagent) |              | Perfluorononanoic acid (PFNA)        | 0.963 g/g     |
| ...LC537-PFOA_00013   | 02/10/18 | 08/10/17  | Methanol, Lot 090285                    | 22.76 mL             | LC537_PFOA_00003    | 0.0228 g     | Perfluorooctanoic acid (PFOA)        | 1.00076 mg/mL |
| ....LC537 PFOA_00003  | 10/31/23 |           | SIGMA ALDRICH, Lot BCBS1198V            |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)        | 0.999 g/g     |
| ...LC537-PFOS_00008   | 02/10/18 | 08/10/17  | Methanol, Lot 090285                    | 44.43 mL             | LC537_PFOS_00003    | 0.0488 g     | Perfluorooctanesulfonic acid (PFOS)  | 1.00016 mg/mL |
| ....LC537_PFOS_00003  | 04/17/19 |           | sigma alrich, Lot SZBE107XV             |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS)  | 0.9106 g/g    |
| .LC537-IS_00048       | 02/04/18 | 08/04/17  | Methanol, Lot 090285                    | 30000 uL             | LCM2PFOA_00007      | 60 uL        | 13C2-PFOA                            | 0.1 ug/mL     |
| ..LCM2PFOA_00007      | 02/12/21 |           | Wellington Laboratories, Lot M2PFOA0216 |                      | LCMPFOS_00021       | 180 uL       | 13C4 PFOS                            | 0.2868 ug/mL  |
| ..LCMPFOS_00021       | 12/12/21 |           | Wellington Laboratories, Lot MPFOS1216  |                      | (Purchased Reagent) |              | 13C2-PFOA                            | 50 ug/mL      |
| .LC537-SU_00049       | 02/04/18 | 08/04/17  | Methanol, Lot 104453                    | 30000 uL             | (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_00013      | 04/08/21 |           | Wellington Laboratories, Lot MPFHxA0416 |                      | LCMPFHxA_00013      | 60 uL        | 13C2 PFHxA                           | 0.1 ug/mL     |
|                       |          |           |                                         |                      | (Purchased Reagent) |              | 13C2 PFDA                            | 50 ug/mL      |
|                       |          |           |                                         |                      | (Purchased Reagent) |              | 13C2 PFHxA                           | 50 ug/mL      |
| <b>LC537-L6_00020</b> | 02/04/18 | 08/14/17  | MeOH/H2O, Lot 090285                    | 5 mL                 | LC537-HSP_00025     | 720 uL       | Perfluorobutanesulfonic acid (PFBS)  | 180.014 ng/mL |
|                       |          |           |                                         |                      |                     |              | Perfluoroheptanoic acid (PFHpA)      | 20.0049 ng/mL |
|                       |          |           |                                         |                      |                     |              | Perfluorohexanesulfonic acid (PFHxS) | 60.0135 ng/mL |
|                       |          |           |                                         |                      |                     |              | Perfluorononanoic acid (PFNA)        | 40.0071 ng/mL |
|                       |          |           |                                         |                      |                     |              | Perfluorooctanoic acid (PFOA)        | 40.0334 ng/mL |
|                       |          |           |                                         |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)  | 80.0195 ng/mL |
|                       |          |           |                                         |                      | LC537-IS_00048      | 500 uL       | 13C2-PFOA                            | 10 ng/mL      |
|                       |          |           |                                         |                      |                     |              | 13C4 PFOS                            | 28.68 ng/mL   |
|                       |          |           |                                         |                      |                     |              | 13C2 PFDA                            | 10 ng/mL      |
| .LC537-HSP_00025      | 02/10/18 | 08/10/17  | Methanol, Lot 141039                    | 20000 uL             | LC537SPIM_00023     | 277.8 uL     | 13C2 PFHxA                           | 10 ng/mL      |
|                       |          |           |                                         |                      |                     |              | Perfluorobutanesulfonic acid (PFBS)  | 1250.1 ng/mL  |
|                       |          |           |                                         |                      |                     |              | Perfluoroheptanoic acid (PFHpA)      | 138.923 ng/mL |
|                       |          |           |                                         |                      |                     |              | Perfluorohexanesulfonic acid (PFHxS) | 416.76 ng/mL  |
|                       |          |           |                                         |                      |                     |              | Perfluorononanoic acid (PFNA)        | 277.827 ng/mL |
|                       |          |           |                                         |                      |                     |              | Perfluorooctanoic acid (PFOA)        | 278.01 ng/mL  |
|                       |          |           |                                         |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)  | 555.691 ng/mL |
| ..LC537SPIM_00023     | 02/10/18 | 08/10/17  | Methanol, Lot 104453                    | 10000 uL             | LC537-PFBS_00008    | 450 uL       | Perfluorobutanesulfonic acid (PFBS)  | 90 ug/mL      |

## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-33018-1

SDG No.: \_\_\_\_\_

| Reagent ID            | Exp Date | Prep Date                               | Dilutant Used        | Reagent Final Volume | Parent Reagent      |              | Analyte                              | Concentration |
|-----------------------|----------|-----------------------------------------|----------------------|----------------------|---------------------|--------------|--------------------------------------|---------------|
|                       |          |                                         |                      |                      | Reagent ID          | Volume Added |                                      |               |
|                       |          |                                         |                      |                      | LC537-PFHpA_00015   | 100 uL       | Perfluoroheptanoic acid (PFHpA)      | 10.0016 ug/mL |
|                       |          |                                         |                      |                      | LC537-PFHxS_00010   | 150 uL       | Perfluorohexanesulfonic acid (PFHxS) | 30.0043 ug/mL |
|                       |          |                                         |                      |                      | LC537-PFNA_00013    | 200 uL       | Perfluorononanoic acid (PFNA)        | 20.002 ug/mL  |
|                       |          |                                         |                      |                      | LC537-PFOA_00013    | 200 uL       | Perfluorooctanoic acid (PFOA)        | 20.0151 ug/mL |
|                       |          |                                         |                      |                      | LC537-PFOS_00008    | 400 uL       | Perfluorooctanesulfonic acid (PFOS)  | 40.0066 ug/mL |
| ...LC537-PFBS_00008   | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 49.6 mL              | LC537_PFBS_00002    | 0.0992 g     | Perfluorobutanesulfonic acid (PFBS)  | 2 mg/mL       |
| ....LC537_PFBS_00002  | 04/01/18 | Sigma, Lot MKBP8842V                    |                      |                      | (Purchased Reagent) |              | Perfluorobutanesulfonic acid (PFBS)  | 1 g/g         |
| ...LC537-PFHpA_00015  | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 48.7 mL              | LC537_PFHpA_00002   | 0.0492 g     | Perfluoroheptanoic acid (PFHpA)      | 1.00016 mg/mL |
| ....LC537_PFHpA_00002 | 04/01/18 | Aldrich, Lot BCBM2579V                  |                      |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid (PFHpA)      | 0.99 g/g      |
| ...LC537-PFHxS_00010  | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 55.92 mL             | LC537_PFHxS_00002   | 0.123 g      | Perfluorohexanesulfonic acid (PFHxS) | 2.00029 mg/mL |
| ....LC537_PFHxS_00002 | 04/01/18 | Sigma, Lot BCBL3545V                    |                      |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid (PFHxS) | 0.9094 g/g    |
| ...LC537-PFNA_00013   | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 62.3 mL              | LC537_PFNA_00002    | 0.0647 g     | Perfluorononanoic acid (PFNA)        | 1000.1 ug/mL  |
| ....LC537 PFNA_00002  | 04/01/18 | TCI America, Lot QN44F                  |                      |                      | (Purchased Reagent) |              | Perfluorononanoic acid (PFNA)        | 0.963 g/g     |
| ...LC537-PFOA_00013   | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 22.76 mL             | LC537_PFOA_00003    | 0.0228 g     | Perfluorooctanoic acid (PFOA)        | 1.00076 mg/mL |
| ....LC537_PFOA_00003  | 10/31/23 | SIGMA ALDRICH, Lot BCBS1198V            |                      |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)        | 0.999 g/g     |
| ...LC537-PFOS_00008   | 02/10/18 | 08/10/17                                | Methanol, Lot 090285 | 44.43 mL             | LC537_PFOS_00003    | 0.0488 g     | Perfluorooctanesulfonic acid (PFOS)  | 1.00016 mg/mL |
| ....LC537_PFOS_00003  | 04/17/19 | sigma alrich, Lot SZBE107XV             |                      |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS)  | 0.9106 g/g    |
| .LC537-IS_00048       | 02/04/18 | 08/04/17                                | Methanol, Lot 090285 | 30000 uL             | LCM2PFOA_00007      | 60 uL        | 13C2-PFOA                            | 0.1 ug/mL     |
| ..LCM2PFOA_00007      | 02/12/21 | Wellington Laboratories, Lot M2PFOA0216 |                      |                      | LCMPFOS_00021       | 180 uL       | 13C4 PFOS                            | 0.2868 ug/mL  |
| ..LCMPFOS_00021       | 12/12/21 | Wellington Laboratories, Lot MPFOS1216  |                      |                      | (Purchased Reagent) |              | 13C2-PFOA                            | 50 ug/mL      |
| .LC537-SU_00049       | 02/04/18 | 08/04/17                                | Methanol, Lot 104453 | 30000 uL             | LCMPFDA_00012       | 60 uL        | 13C4 PFOS                            | 47.8 ug/mL    |
| ..LCMPFDA_00012       | 09/30/21 | Wellington Laboratories, Lot MPFDA0916  |                      |                      | LCMPFHxA_00013      | 60 uL        | 13C2 PFDA                            | 0.1 ug/mL     |
| ..LCMPFHxA_00013      | 04/08/21 | Wellington Laboratories, Lot MPFHxA0416 |                      |                      | (Purchased Reagent) |              | 13C2 PFHxA                           | 0.1 ug/mL     |
| LC537-SU_00051        | 03/20/18 | 09/20/17                                | Methanol, Lot 104453 | 30000 uL             | LCMPFDA_00012       | 60 uL        | 13C2 PFDA                            | 50 ug/mL      |
| .LCMPFDA_00012        | 09/30/21 | Wellington Laboratories, Lot MPFDA0916  |                      |                      | LCMPFHxA_00015      | 60 uL        | 13C2 PFHxA                           | 0.1 ug/mL     |
| .LCMPFHxA_00015       | 11/22/21 | Wellington Laboratories, Lot MPFHxA1116 |                      |                      | (Purchased Reagent) |              | 13C2 PFDA                            | 50 ug/mL      |
|                       |          |                                         |                      |                      | (Purchased Reagent) |              | 13C2 PFHxA                           | 50 ug/mL      |



Reagent

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**LC537\_PFB\_00002**

4/1/15 SPV

**SIGMA-ALDRICH®**

sigma-aldrich.com

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: [www.sigmaaldrich.com](http://www.sigmaaldrich.com)

Email USA: [techserv@sial.com](mailto:techserv@sial.com)

Outside USA: [eurtechserv@sial.com](mailto:eurtechserv@sial.com)

## Certificate of Analysis

Product Name:

Nonafluorobutane-1-sulfonic acid - 97%

Product Number:

562629

Batch Number:

MKBP8842V

Brand:

ALDRICH

CAS Number:

375-73-5

MDL Number:

MFCD01320794

Formula:

C<sub>4</sub>HF<sub>9</sub>O<sub>3</sub>S

Formula Weight:

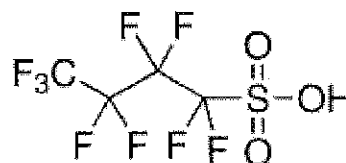
300.10 g/mol

Storage Temperature:

Store at 2 - 8 °C

Quality Release Date:

11 OCT 2013



PFBS

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

*Jamie Gleason*

Jamie Gleason, Manager

Quality Control

Milwaukee, Wisconsin US

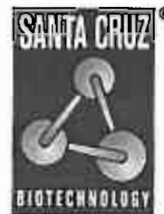
Sigma-Aldrich warrants, that at the time of the quality release or subsequent retest date this product conformed to the information contained in this publication. The current Specification sheet may be available at Sigma-Aldrich.com. For further inquiries, please contact Technical Service. Purchaser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

Reagent

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**LC537\_PFB2\_00002**

11.6.8.17 SW



# CERTIFICATE OF ANALYSIS

The Power to Question

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

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

Reagent

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**LC537\_PFH<sub>p</sub>A\_00002**

## Certificate of Analysis

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

PFH<sub>7</sub>A

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



Dr. Claudia Geitner  
Manager Quality Control  
Buchs, Switzerland

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

Reagent

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**LC537\_PFHpA2\_00002**

# Certificate of analysis

r:6.13.17 SW

PFHe A

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

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

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**LC537\_PFHxS\_00002**

Y: 4/1/15 SW

**SIGMA-ALDRICH®**

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

## Certificate of Analysis

**Product Name:** TRIDECAFLUOROHXANE-1-SULFONIC ACID POTASSIUM SALT  
**Product Number:** 50929  
**Batch Number:** BCBL3545V  
**Brand:** Aldrich  
**CAS Number:** 3871-99-6  
**Formula:**  $C_{13}F_{27}KO_2S$   
**Formula Weight:** 438.20  
**Quality Release Date:** 20 JUN 2013

PFH<sub>13</sub>S-K

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

*Claudia Geitner*

Dr. Claudia Geitner  
Manager Quality Control  
Buchs, Switzerland

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

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

SW 4/1/15

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

Reagent

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**LC537\_PFHxS2\_00002**

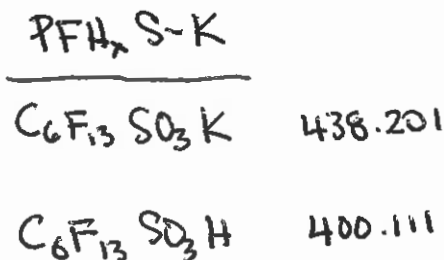


The Future is Now

# CERTIFICATE OF ANALYSIS

Catalog Number: sc-237289  
 Lot Number: G2516  
 Product Name: Tridecafluorohexane-1-sulfonic acid potassium salt  
 CAS Number: 3871-99-6  
 Molecular Formula:  $C_{13}F_{27}KO_2S$   
 Molecular Weight: 438.20

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



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

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

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

Reagent

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**LC537\_PFNA\_00002**

R: 4/1/15 SKV



# Certificate of Analysis

Apr 2, 2015 (JST)

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

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

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

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

## Customer service:

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

PFNA

Reagent

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**LC537\_PFNA2\_00002**

11.6.14.17 SKW

**SIGMA-ALDRICH**

sigma-aldrich.com

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: [www.sigmaaldrich.com](http://www.sigmaaldrich.com)

Email USA: [techserv@sial.com](mailto:techserv@sial.com)

Outside USA: [eurtechserv@sial.com](mailto: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:

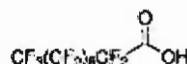
C<sub>9</sub>H<sub>17</sub>O<sub>2</sub>

Formula Weight:

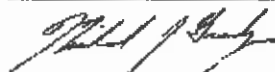
464.08 g/mol

Quality Release Date:

07 DEC 2016



| Test               | Specification                                                                  | Result   |
|--------------------|--------------------------------------------------------------------------------|----------|
| Appearance (Color) | White to Off-White                                                             | White    |
| Appearance (Form)  | Powder or Crystals or Crystalline<br>Chunk(s) or Granule or Flakes<br>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.



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**LC537\_PFOA\_00003**

C: 11/30/16 SKV  
PFA

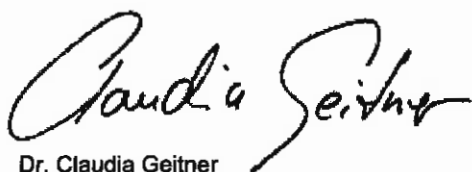
**SIGMA-ALDRICH**

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

## Certificate of Analysis

**Product Name:** PENTADECAFLUOROOCTANOIC ACID  
analytical standard  
**Product Number:** 33824  
**Batch Number:** BCBS1198V  
**Brand:** Sigma-Aldrich  
**CAS Number:** 335-67-1  
**Formula:**  $\text{CF}_3(\text{CF}_2)_6\text{COOH}$   
**Formula Weight:** 414.07  
**Expiration Date:** OCT 2023  
**Quality Release Date:** 12 MAY 2016

| TEST                   | SPECIFICATION     | RESULT   |
|------------------------|-------------------|----------|
| PURITY (HPLC AREA %)   | $\geq 98.0\%$     | 100.0%   |
| IDENTIFICATION (LC-MS) | IDENTITY CONFORMS | CONFORMS |



Dr. Claudia Geitner  
Manager Quality Control  
Buchs, Switzerland

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

Reagent

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**LC537\_PFOA2\_00002**

# Certificate of analysis

17: 6/9/17 SW

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

PFOA

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

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**LC537\_PFOS\_00003**

n: 11/30/16 SV  
PFOS

**SIGMA-ALDRICH**

**CERTIFICATE OF ANALYSIS**

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

Seelze, 22.04.2014/524107/14/08646

Order-No.:

Customer-No.:

Order-Code:

Quantity:

Production Date: 17.Apr.2014

Expiry Date: 17.Apr.2019

Article/Product: 33829

Batch : SZBE107XV

Heptadecafluorooctanesulfonic acid potassium salt OEKANAL®

**Reference Material (RM)**

**1. General Information**

Formula: C<sub>8</sub>F<sub>17</sub>KO<sub>3</sub>S

CAS-No.: [2795-39-3]

Usage : PFOS

Molar mass: 538.22 g/Mole

Recomm. storage temp.: roomtemp.

The estimated uncertainty of a single measurement of the assay can be expected to be 0.5 % relative (confidence level = 95%, n= 6) whereby the assay measurements are calculated by 100% minus found impurities.

**2. Batch Analysis**

Identity

Assay (LC-MS)

Date of Analysis

complying

98 %

22.Apr.2014

**3. Advice and Remarks**

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

Sigma-Aldrich Laborchemikalien GmbH  
Quality Management SA-LC

Reagent

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**LC537\_PFOS2\_00002**

R: 6.14.17 SKV

**SIGMA-ALDRICH**

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

# Certificate of Analysis

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

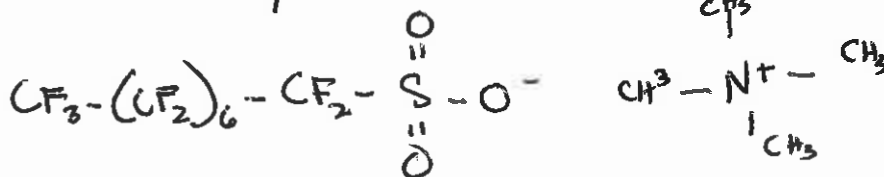
| TEST               | SPECIFICATION                  | RESULT    |
|--------------------|--------------------------------|-----------|
| APPEARANCE (COLOR) | WHITE TO OFF WHITE             | OFF-WHITE |
| APPEARANCE (FORM)  | POWDER OR POWDER WITH CHUNK(S) | POWDER    |
| CARBON CONTENT     | 29.77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

*Claudia Geitner*

Dr. Claudia Geitner  
Manager Quality Control  
Buchs, Switzerland

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

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



$$\begin{array}{r} \text{C}_8\text{F}_{17}\text{SO}_3^+\text{H} \\ \text{C} = 12.011 \quad 96.088 \\ \text{F} = 18.998 \quad 322.966 \\ \text{S} = 32.066 \quad 32.066 \\ \text{O} = 16.000 \quad 47.947 \\ \text{H} = 1.008 \quad 1.008 \\ \text{N} = 14.007 \quad - \\ \hline 500.125 \end{array}$$

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



Reagent

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**LCM2PFOA\_00007**



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

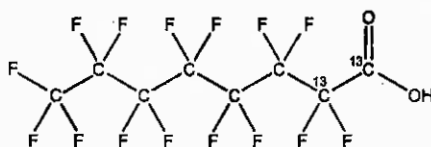
M2PFOA

**LOT NUMBER:**

M2PFOA0216

**COMPOUND:**Perfluoro-n-[1,2-<sup>13</sup>C<sub>2</sub>]octanoic acid**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>6</sub>HF<sub>16</sub>O<sub>2</sub>**CONCENTRATION:**

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:**

416.05

**SOLVENT(S):**

Methanol

Water (&lt;1%)

**CHEMICAL PURITY:**

&gt;98%

**ISOTOPIC PURITY:**≥99% <sup>13</sup>C(1,2-<sup>13</sup>C<sub>2</sub>)**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:**

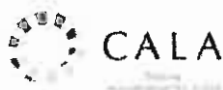
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**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.

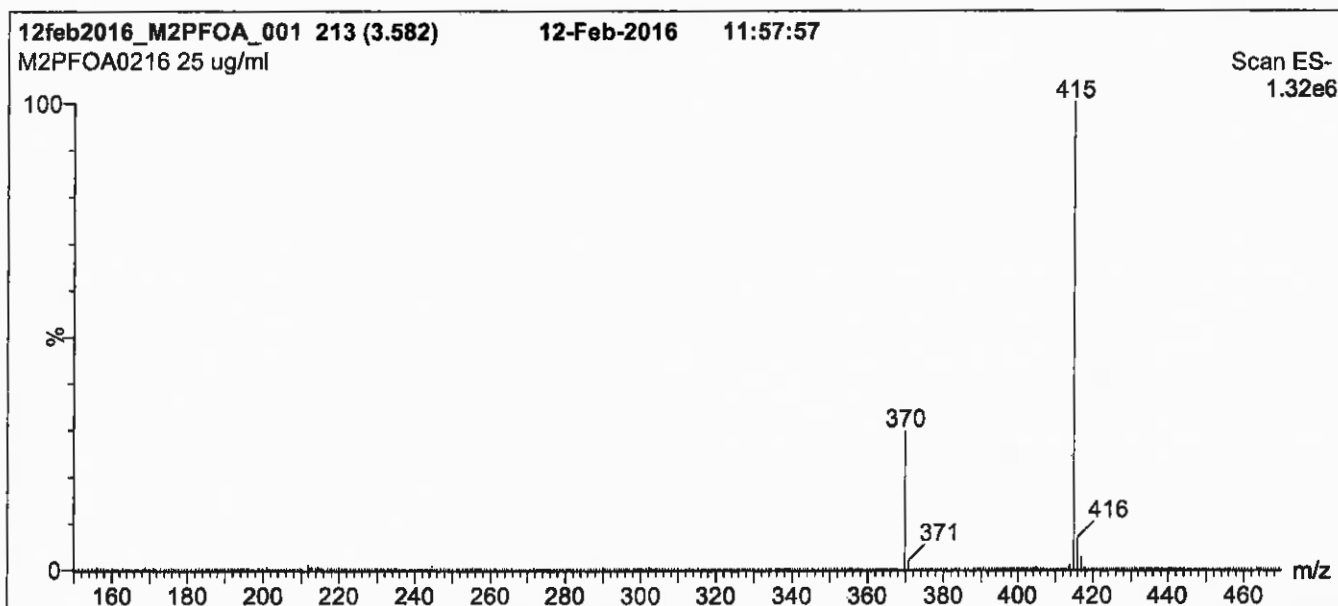
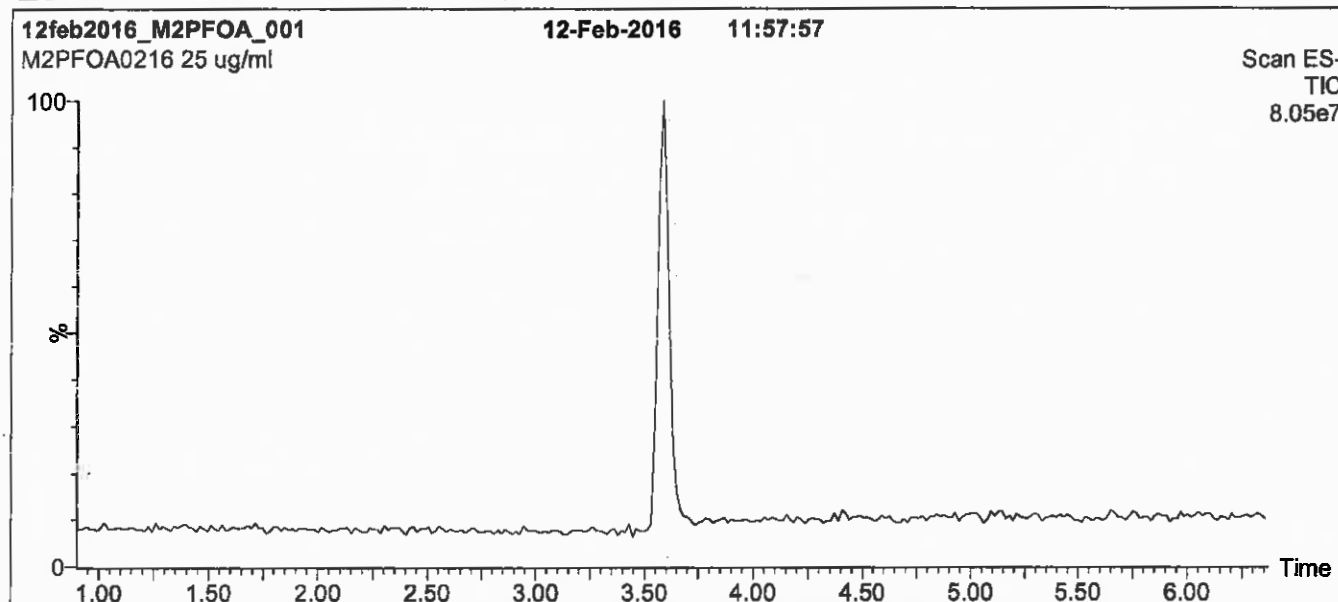
**QUALITY MANAGEMENT:**

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](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\***

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



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc 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  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)

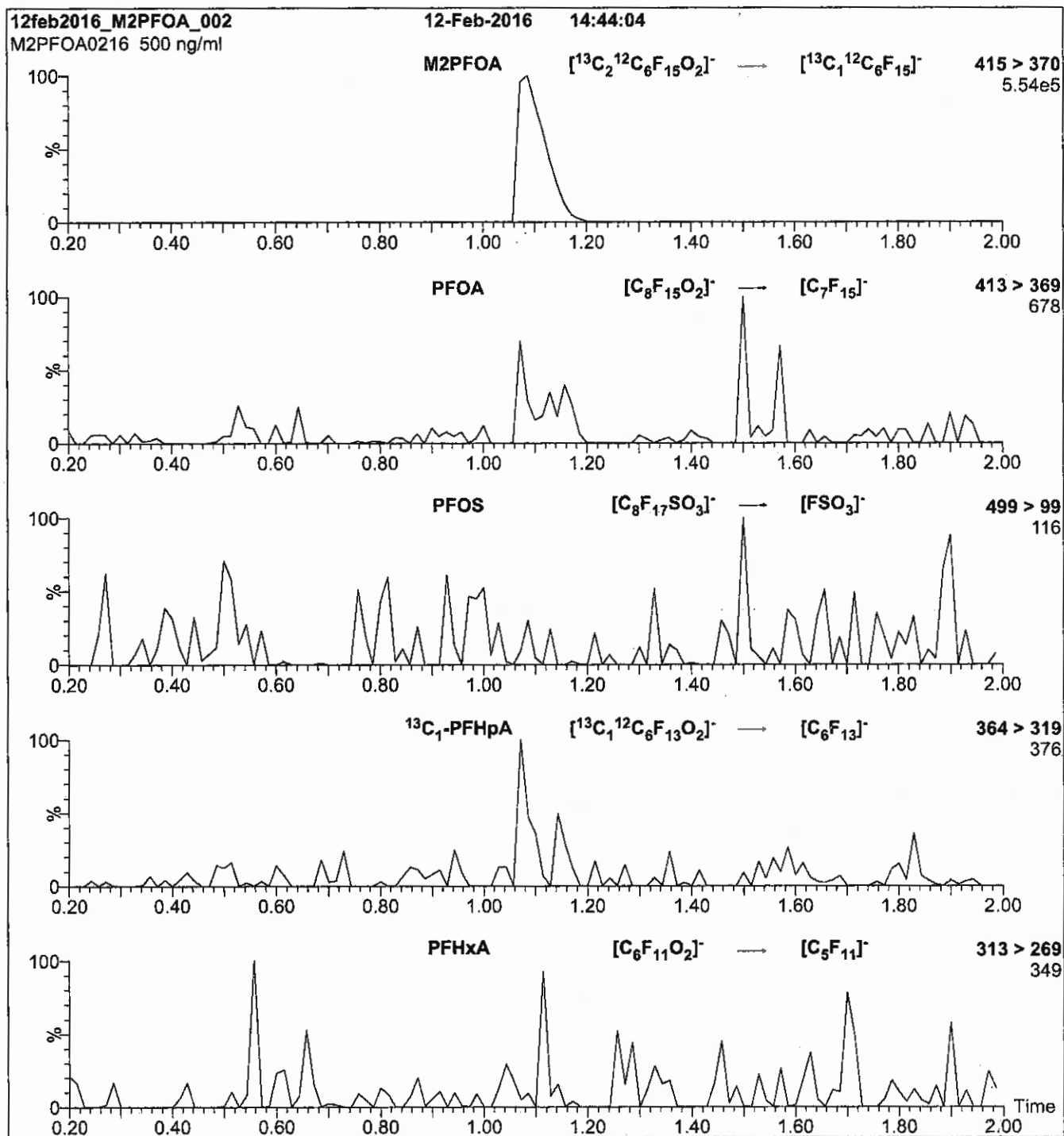
Capillary Voltage (kV) = 3.00

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  $\mu\text{l}$  (500 ng/ml M2PFOA)

Mobile phase: Isocratic 80% MeOH / 20%  $\text{H}_2\text{O}$

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

**MS Parameters**

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

Reagent

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**LCMPFDA\_00012**

R: SBC 12/21/16



814255

ID: LCMFDA\_00012

Exp: 09/30/21 Prod: SBC

13C2-Perfluorodecanoic acid



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

MPFDA

**COMPOUND:**

Perfluoro-n-[1,2-<sup>13</sup>C<sub>2</sub>]decanoic acid

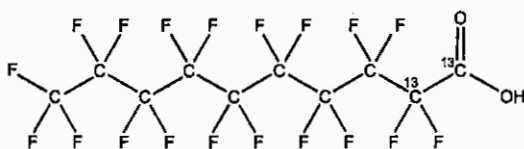
**LOT NUMBER:**

MPFDA0916

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>8</sub>HF<sub>19</sub>O<sub>2</sub>

**CONCENTRATION:**

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:**

516.07

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

**ISOTOPIC PURITY:**

≥99% <sup>13</sup>C

**LAST TESTED:** (mm/dd/yyyy)

09/30/2016

(1,2-<sup>13</sup>C<sub>2</sub>)

**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 <sup>13</sup>C<sub>1</sub>-PFNA.

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

Certified By:

B.G. Chritton

Date: 10/07/2016

(mm/dd/yyyy)

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

**INTENDED USE:**

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**HAZARDS:**

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**SYNTHESIS / CHARACTERIZATION:**

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

**HOMOGENEITY:**

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:**

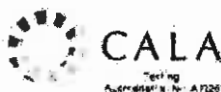
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**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:**

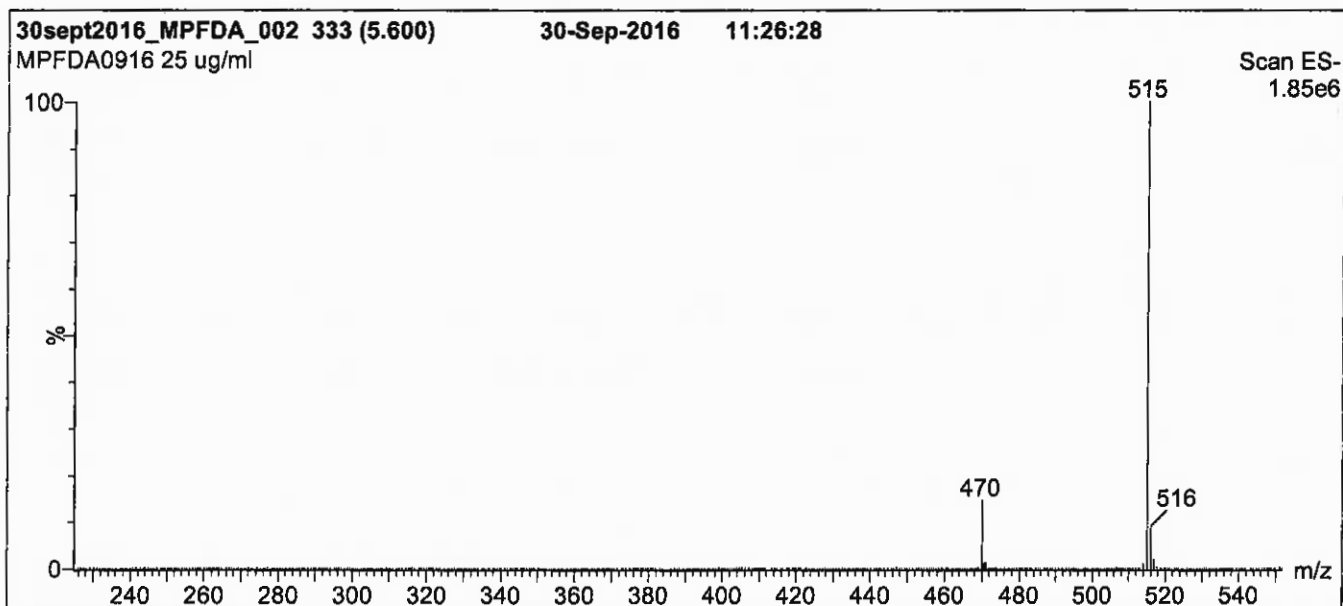
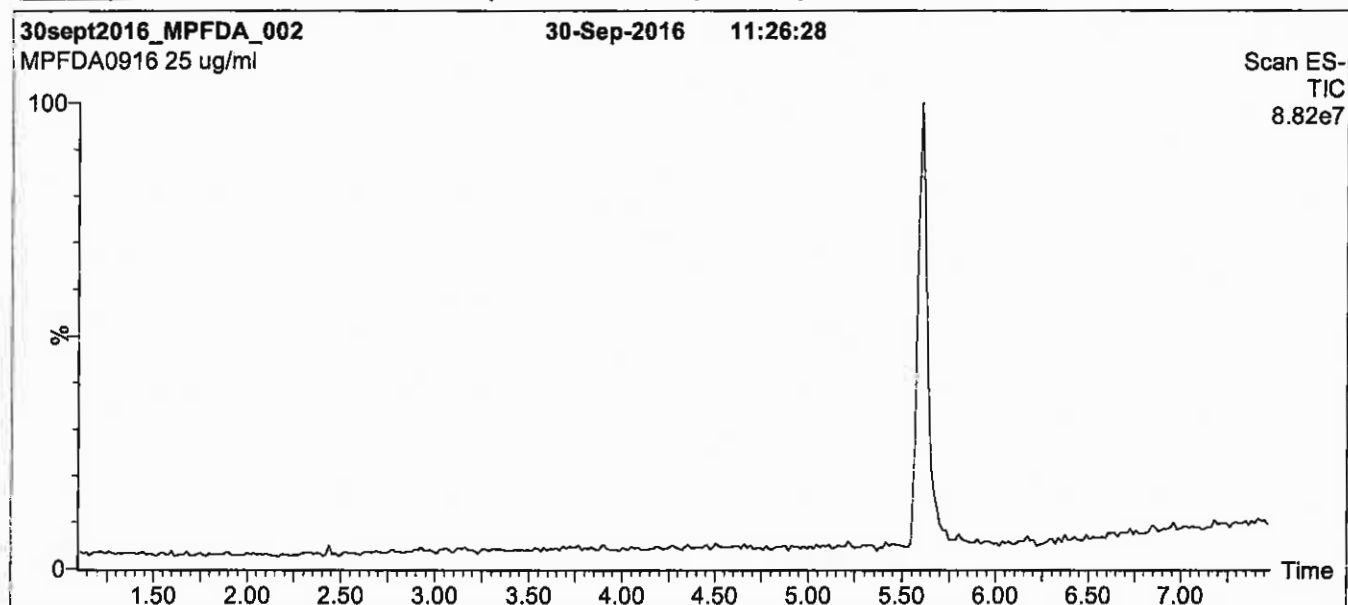
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



**\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at [www.well-labs.com](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\***



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



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient  
Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc 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

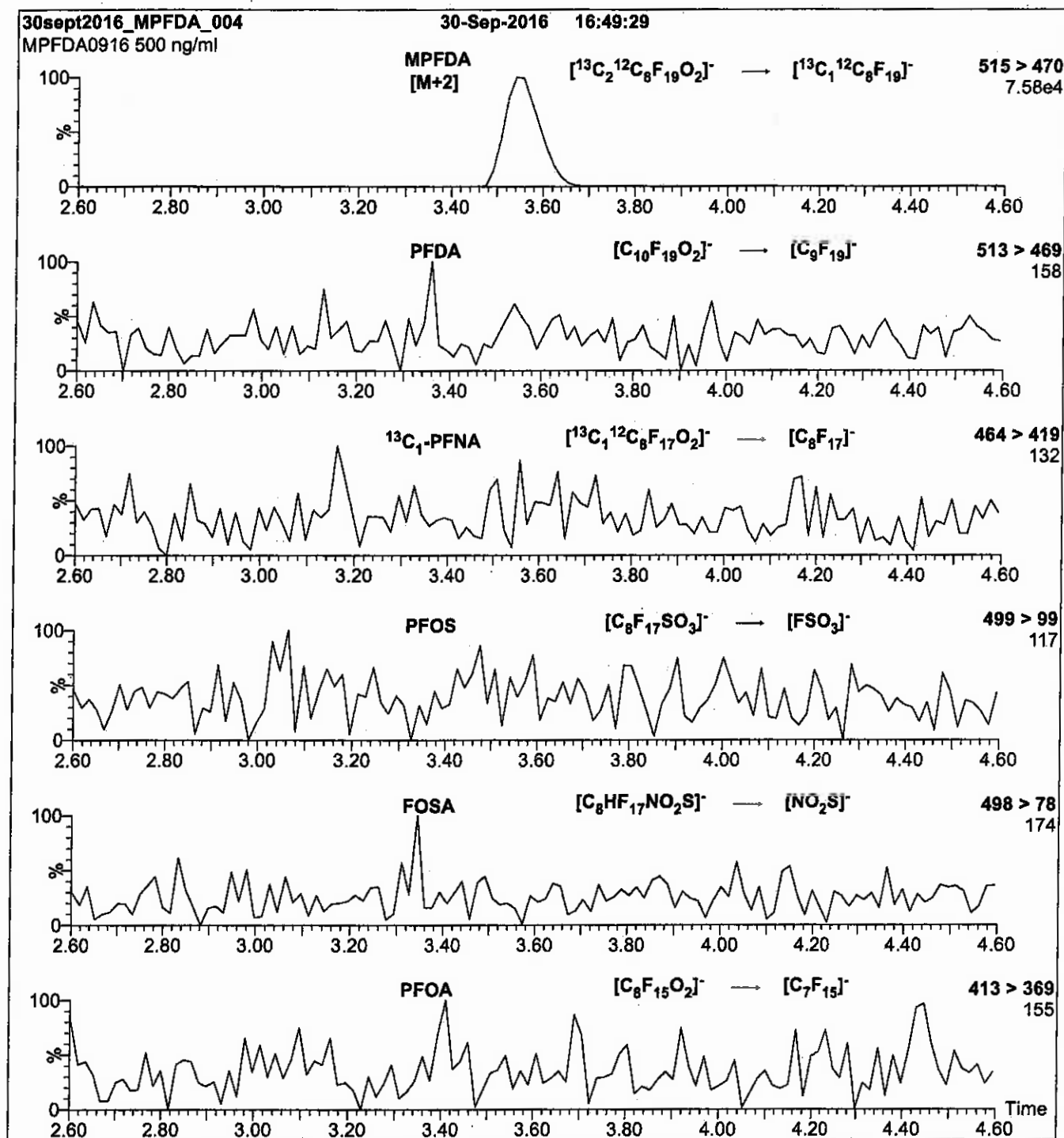
Flow: 300  $\mu$ l/min

**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  $\mu$ l (500 ng/ml MPFDA)

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

Flow: 300  $\mu$ l/min

**MS Parameters**

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

Reagent

---

**LCMPFHxA\_00013**

R: SBC 12/21/16



814258

ID: LCMPFHxA\_00013

Exp: 04/08/21 Ppdt: SBC

13C2-Perfluorohexanoic ac

**WELLINGTON  
LABORATORIES****CERTIFICATE OF ANALYSIS  
DOCUMENTATION****PRODUCT CODE:**

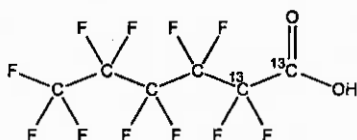
MPFHxA

**LOT NUMBER:**

MPFHxA0416

**COMPOUND:**Perfluoro-n-[1,2-<sup>13</sup>C<sub>2</sub>]hexanoic acid**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>4</sub>HF<sub>11</sub>O<sub>2</sub>**CONCENTRATION:**

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:**

316.04

**SOLVENT(S):**

Methanol

Water (&lt;1%)

**CHEMICAL PURITY:**

&gt;98%

**ISOTOPIC PURITY:**≥99%<sup>13</sup>C**LAST TESTED:** (mm/dd/yyyy)

04/08/2016

**EXPIRY DATE:** (mm/dd/yyyy)

04/08/2021

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

**DOCUMENTATION/ DATA ATTACHED:**

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

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

**ADDITIONAL INFORMATION:**

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

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

Certified By:

  
B.G. Chittim

Date: 04/29/2016

(mm/dd/yyyy)

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

#### **INTENDED USE:**

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

#### **HAZARDS:**

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#### **HOMOGENEITY:**

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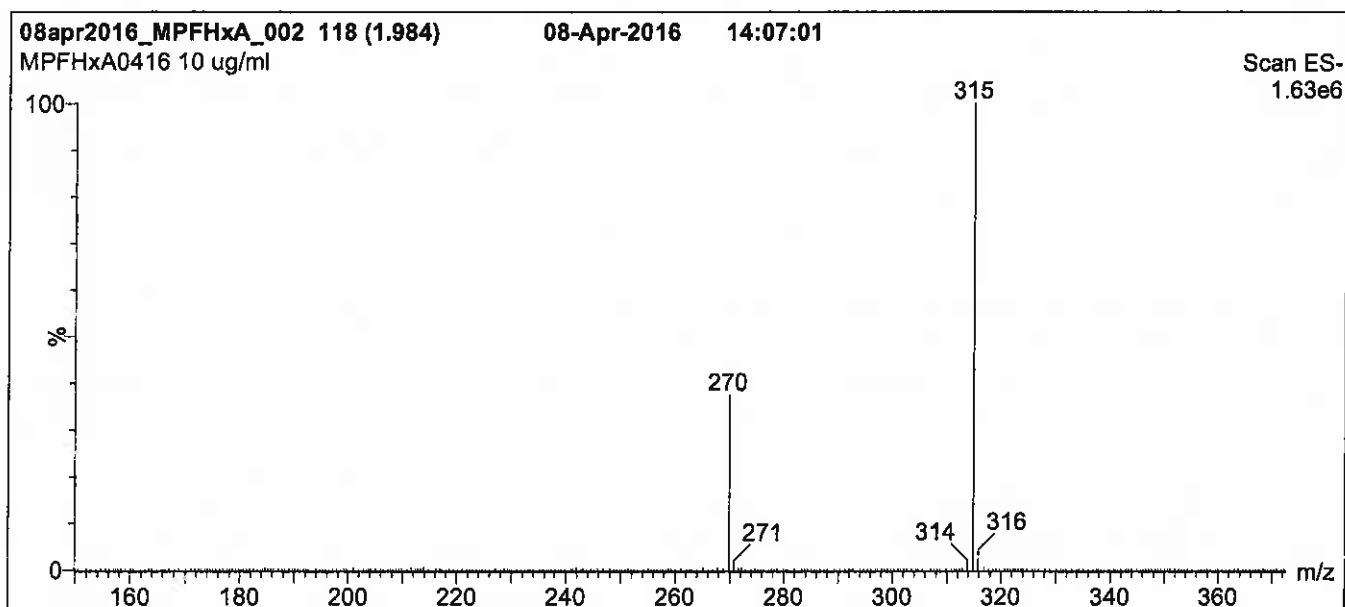
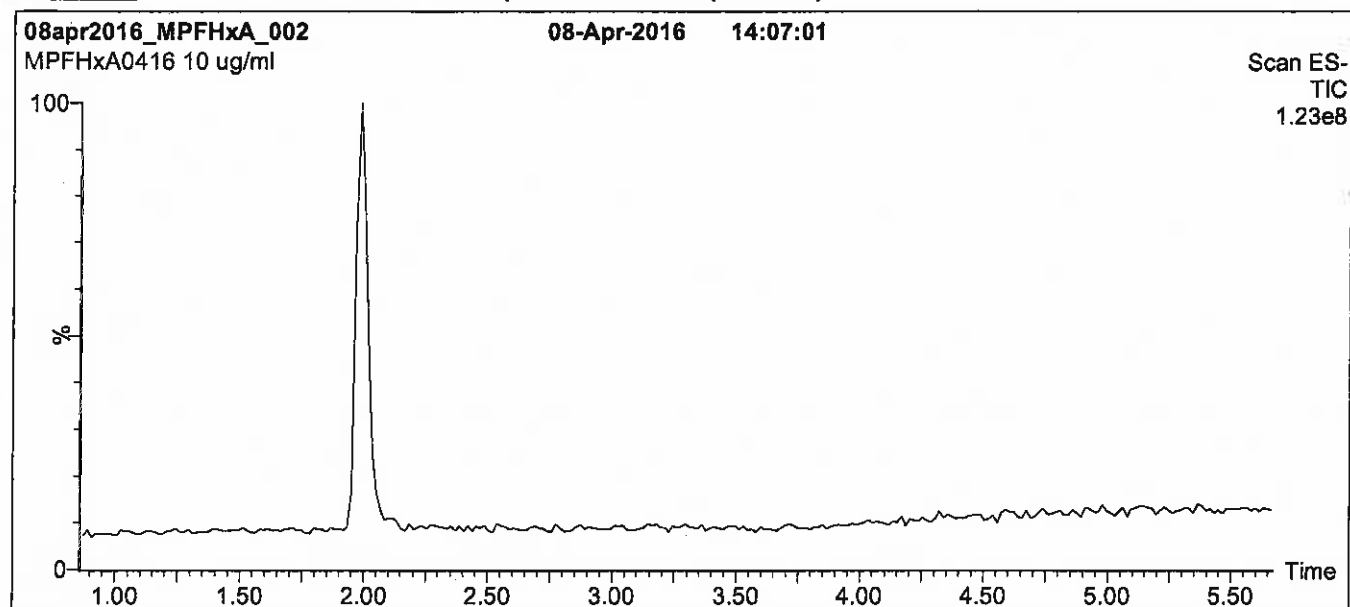
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**Figure 1: MPFHxA; LC/MS Data (TIC and Mass Spectrum)**



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)

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

Time: 10 min

Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)

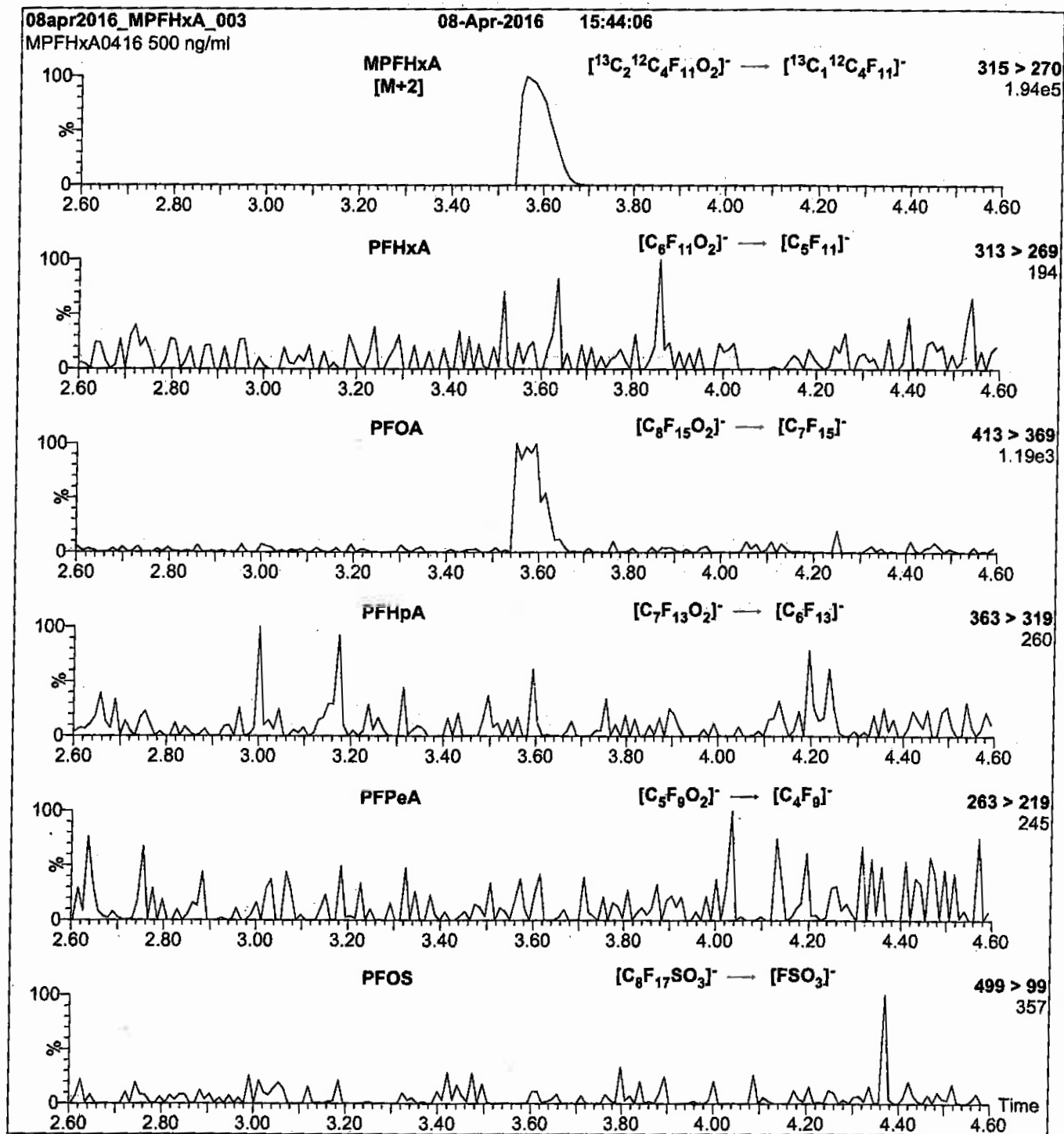
Capillary Voltage (kV) = 2.00

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  $\mu\text{l}$  (500 ng/ml MPFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20%  $\text{H}_2\text{O}$   
(both with 10 mM  $\text{NH}_4\text{OAc}$  buffer)

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

**MS Parameters**

Collision Gas (mbar) =  $3.39\text{e-}3$   
Collision Energy (eV) = 10

Reagent

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**LCMPFHxA\_00015**



17: 5/16/17 SKJ



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** MPFHxA  
**COMPOUND:** Perfluoro-n-[1,2-<sup>13</sup>C<sub>2</sub>]hexanoic acid

**LOT NUMBER:** MPFHxA1116

**STRUCTURE:** **CAS #:** Not available



**MOLECULAR FORMULA:** <sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>4</sub>HF<sub>11</sub>O<sub>2</sub>  
**CONCENTRATION:** 50 ± 2.5 µg/ml

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

**CHEMICAL PURITY:** >98%  
**LAST TESTED:** (mm/dd/yyyy) 11/22/2016  
**EXPIRY DATE:** (mm/dd/yyyy) 11/22/2021

**ISOTOPIC PURITY:** ≥99% <sup>13</sup>C  
(1,2-<sup>13</sup>C<sub>2</sub>)

**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:**

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

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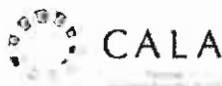
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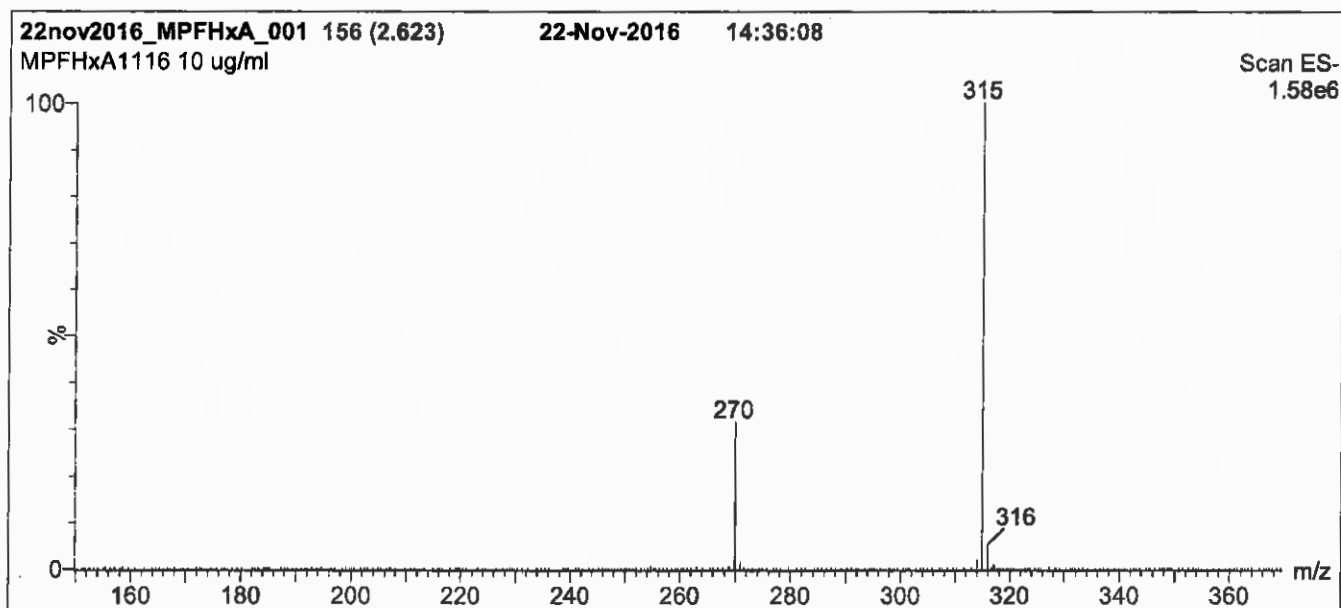
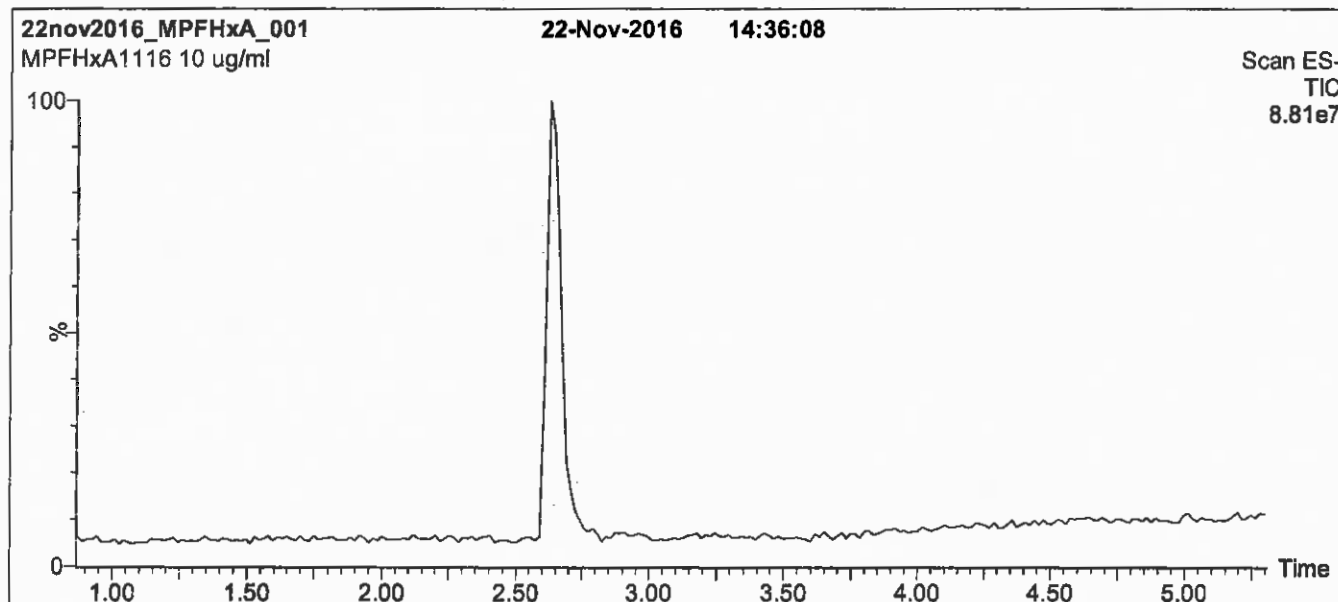
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**Figure 1: MPFHxA; LC/MS Data (TIC and Mass Spectrum)**



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

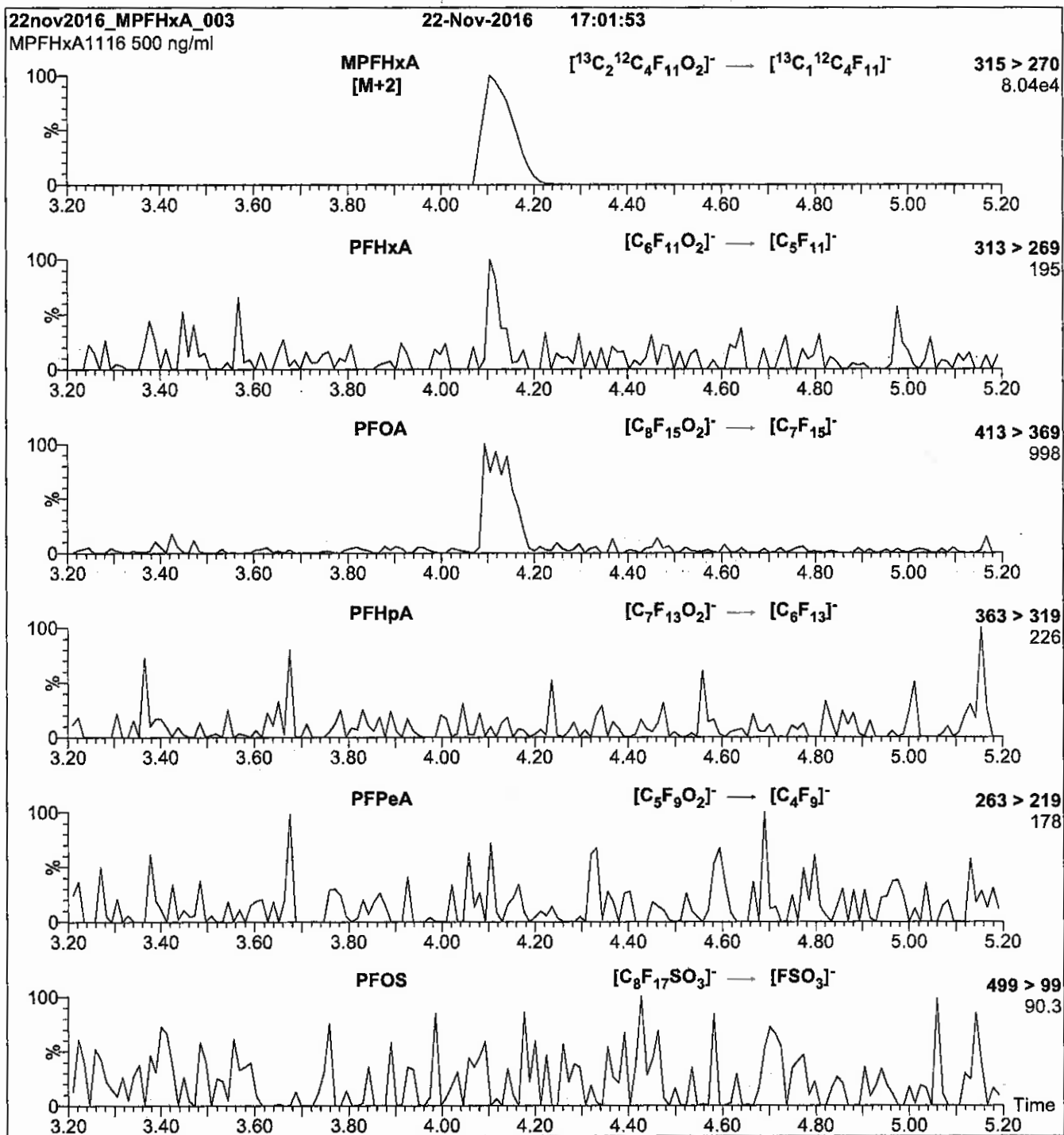
Mobile phase: Gradient  
Start: 40% (80:20 MeOH:ACN) / 60% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 7 min and hold for 2 min  
before returning to initial conditions over 0.5 min.  
Time: 10 min

Flow: 300  $\mu$ 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  $\mu$ l (500 ng/ml MPFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

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

Reagent

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**LCMPFOS\_00019**

R: SBC 12/21/16



814253

ID: LCMFOS\_00019

Exp: 08/03/21 Pipd: SBC

13C4-Perfluorooctanesulfo

WELLINGTON  
LABORATORIESCERTIFICATE OF ANALYSIS  
DOCUMENTATION**PRODUCT CODE:**

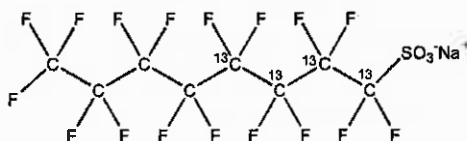
MPFOS

**LOT NUMBER:**

MPFOS0816

**COMPOUND:**Sodium perfluoro-1-[1,2,3,4-<sup>13</sup>C<sub>4</sub>]octanesulfonate**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**<sup>13</sup>C<sub>4</sub><sup>12</sup>C<sub>4</sub>F<sub>17</sub>SO<sub>3</sub>Na**CONCENTRATION:**

50.0 ± 2.5 µg/ml (Na salt)

47.8 ± 2.4 µg/ml (MPFOS anion)

**MOLECULAR WEIGHT:**

526.08

**SOLVENT(S):**

Methanol

**CHEMICAL PURITY:**

&gt;98%

**ISOTOPIC PURITY:**≥99% <sup>13</sup>C**LAST TESTED:** (mm/dd/yyyy)

08/03/2016

(1,2,3,4-<sup>13</sup>C<sub>4</sub>)**EXPIRY DATE:** (mm/dd/yyyy)

08/03/2021

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

**DOCUMENTATION/ DATA ATTACHED:**

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

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

**ADDITIONAL INFORMATION:**

- See page 2 for further details.
- Contains ~ 0.8% Sodium perfluoro-1-[1,2,3-<sup>13</sup>C<sub>3</sub>]heptanesulfonate.

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

Certified By:

  
B.G. Chittim

Date: 08/05/2016

(mm/dd/yyyy)

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

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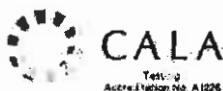
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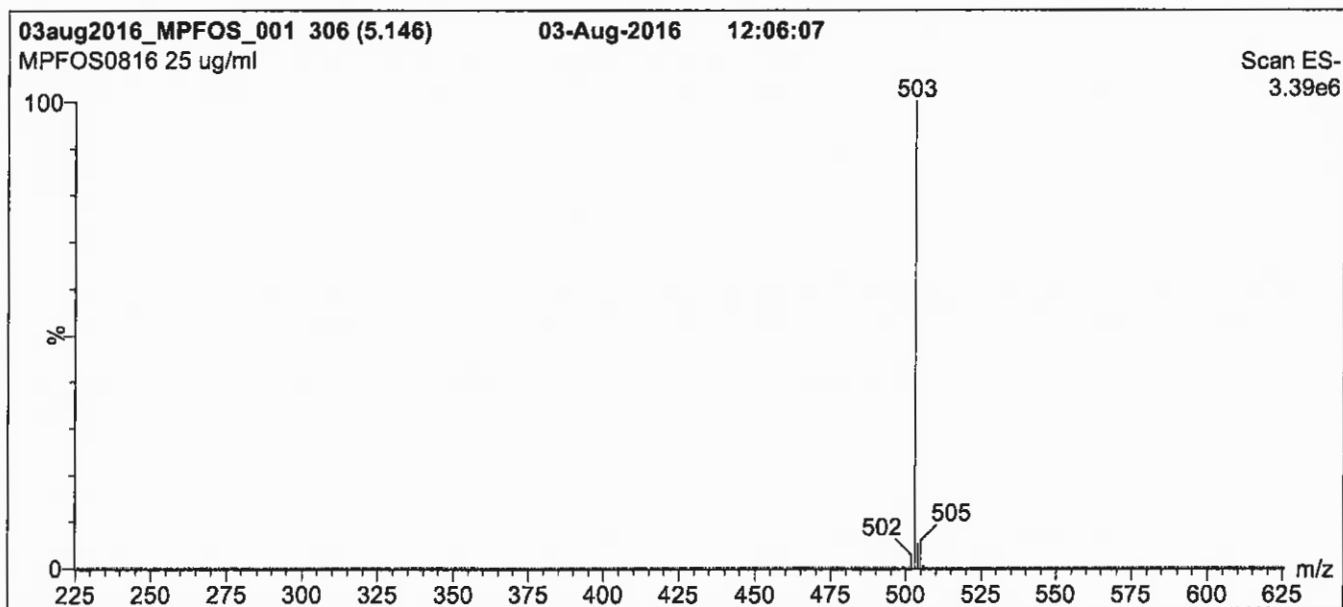
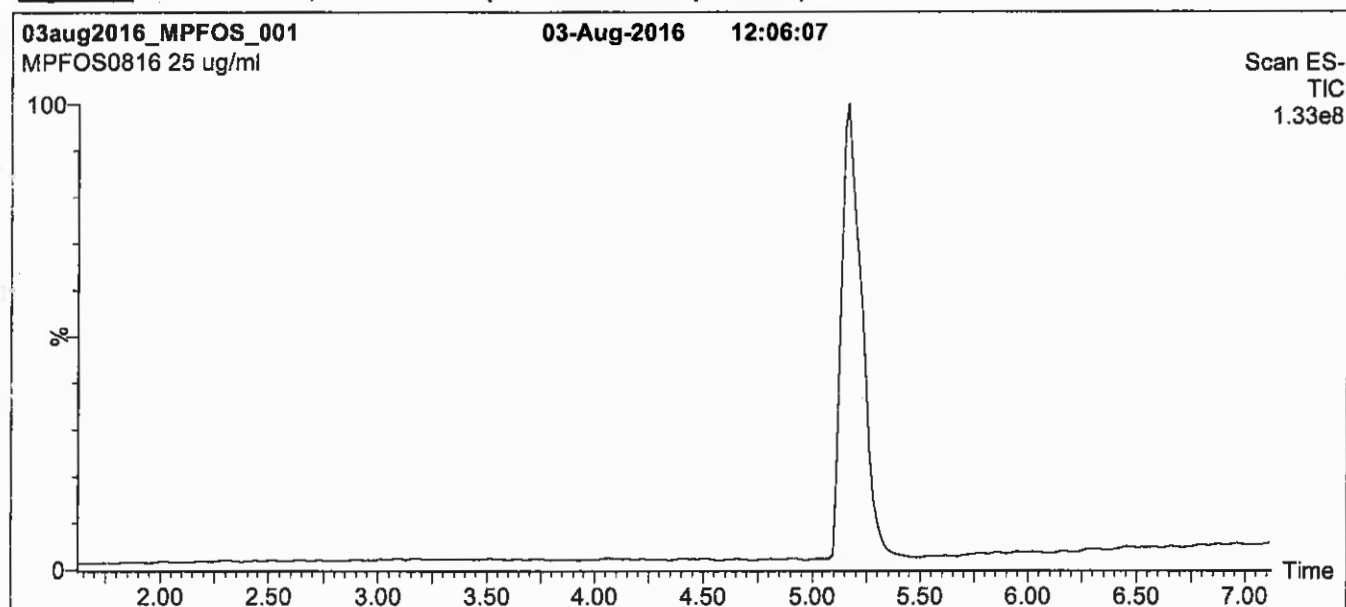
**QUALITY MANAGEMENT:**

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



**\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at [www.well-labs.com](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\***

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



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

**Mobile phase:** Gradient

Start: 45% (80:20 MeOH:ACN) / 55% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc 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  $\mu$ l/min

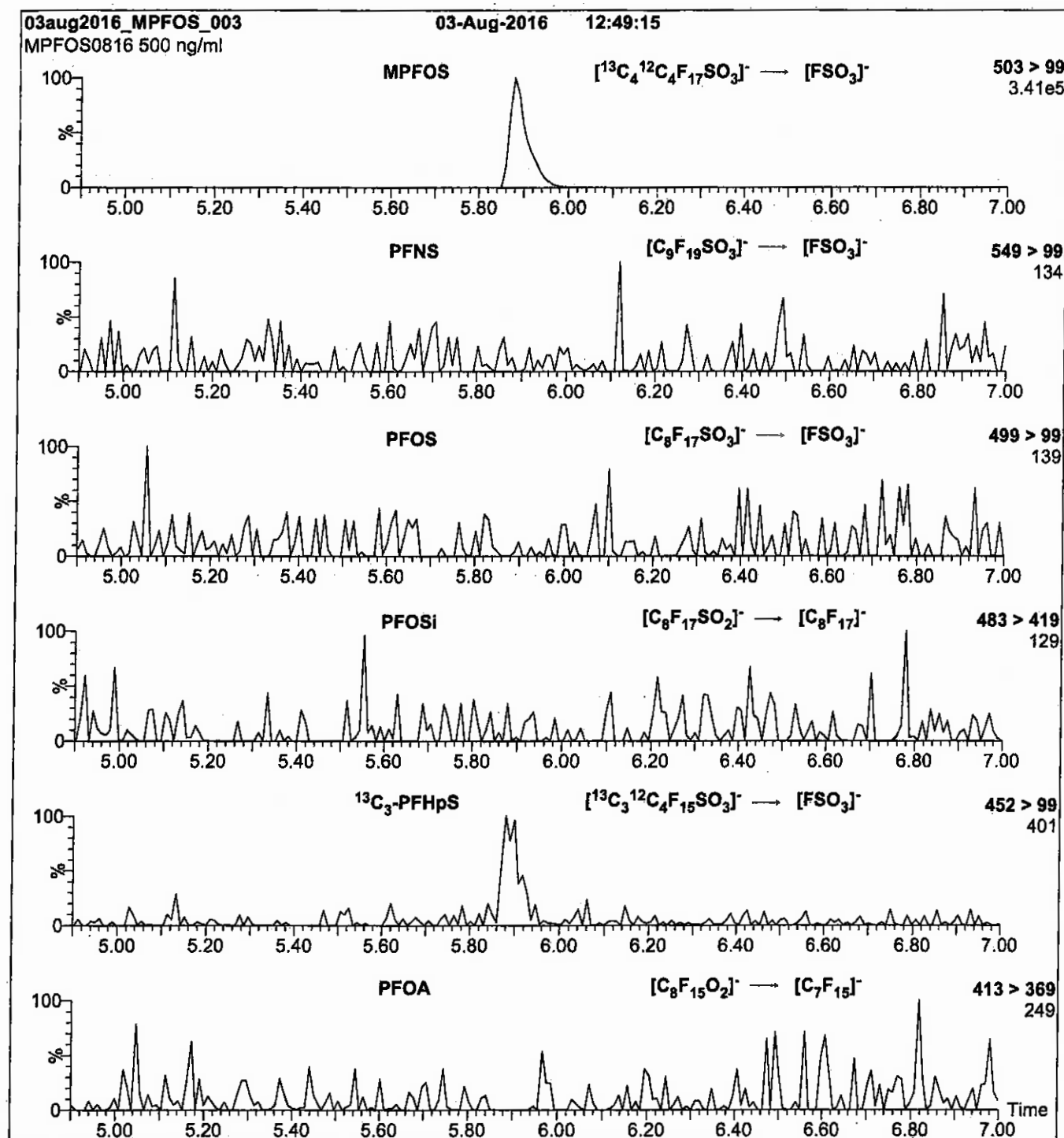
**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

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



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



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu\text{l}$  (500 ng/ml MPFOS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20%  $\text{H}_2\text{O}$   
(both with 10 mM  $\text{NH}_4\text{OAc}$  buffer)

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

**MS Parameters**

Collision Gas (mbar) = 3.46e-3

Collision Energy (eV) = 40

Reagent

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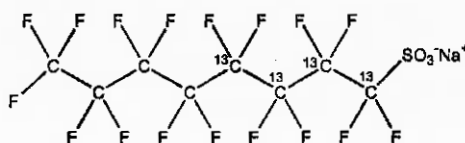
**LCMPFOS\_00021**



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** MPFOS **LOT NUMBER:** MPFOS1216  
**COMPOUND:** Sodium perfluoro-1-[1,2,3,4-<sup>13</sup>C<sub>4</sub>]octanesulfonate  
**STRUCTURE:** **CAS #:** Not available



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

### DOCUMENTATION/ DATA ATTACHED:

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

### ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.8% Sodium perfluoro-1-[1,2,3-<sup>13</sup>C<sub>3</sub>]heptanesulfonate.

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

Certified By:

B.G. Chittim

Date: 12/14/2016

(mm/dd/yyyy)

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

**INTENDED USE:**

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:**

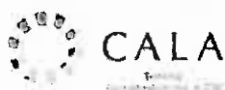
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**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.

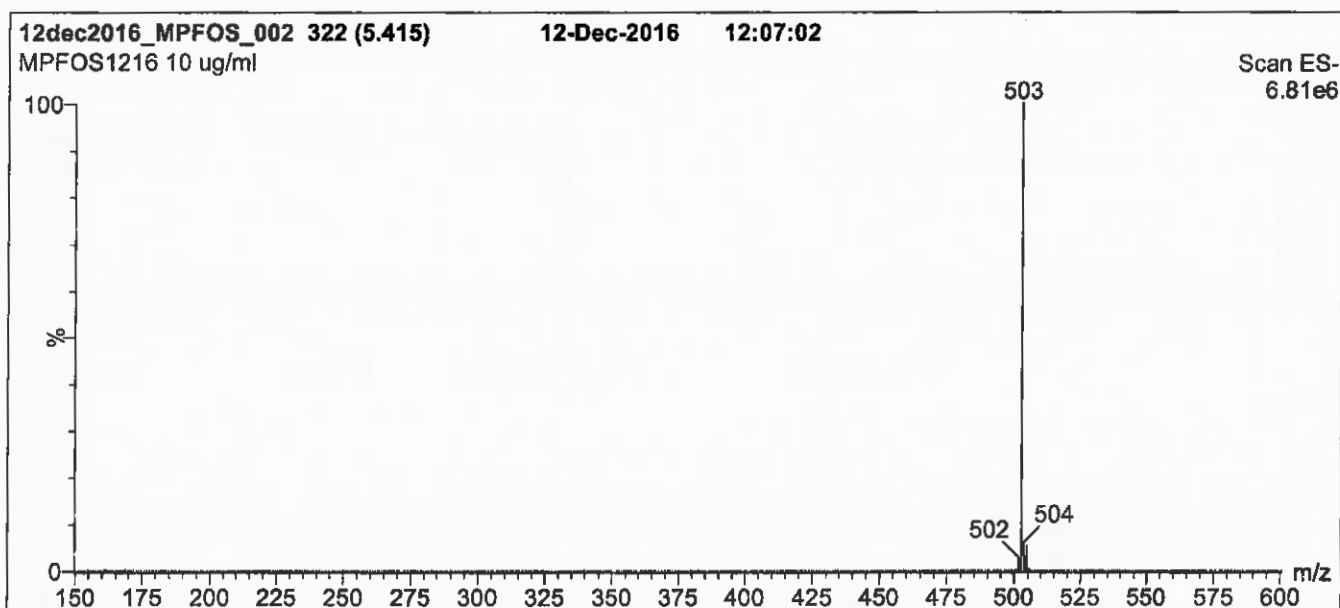
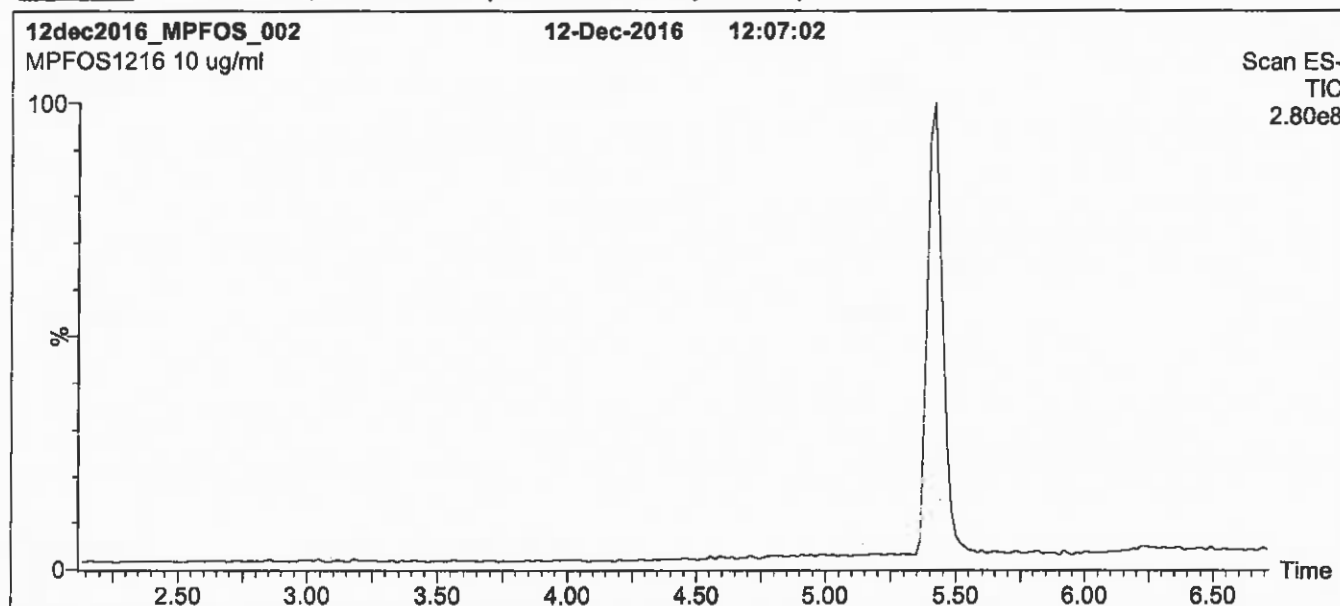
**QUALITY MANAGEMENT:**

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



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 85% organic over 7.5 min and hold for 1.5 min  
before returning to initial conditions in 0.5 min.  
Time: 10 min

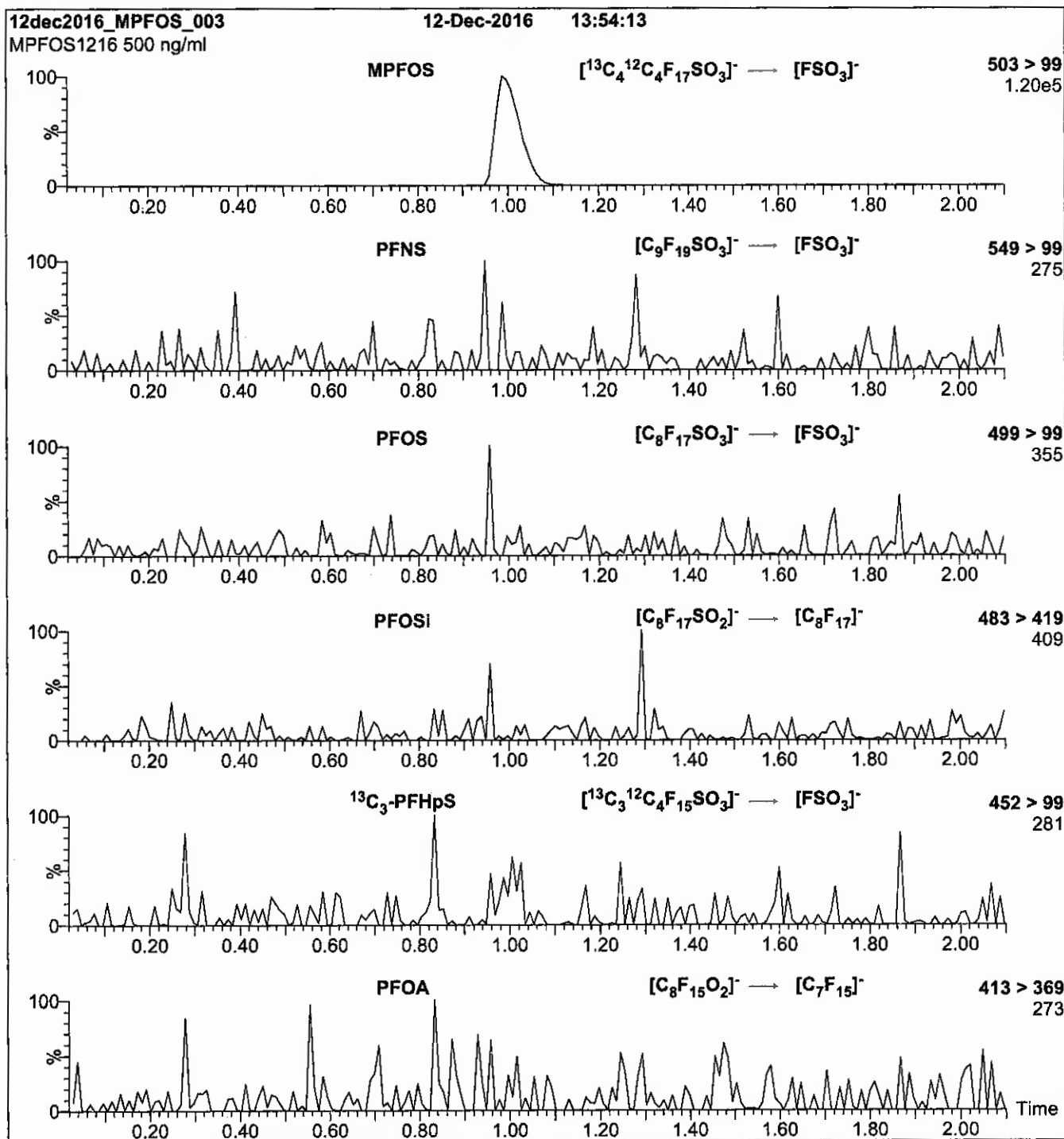
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

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

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



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu\text{l}$  (500 ng/ml MPFOS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20%  $\text{H}_2\text{O}$   
(both with 10 mM  $\text{NH}_4\text{OAc}$  buffer)

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

**MS Parameters**

Collision Gas (mbar) = 3.35e-3  
Collision Energy (eV) = 40

# Method 537 DOD

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

FORM II  
LCMS SURROGATE RECOVERY

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

SDG No.: \_\_\_\_\_

Matrix: Water Level: Low

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

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

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.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2017.11.13\_537A\_008.d  
 Lab ID: LCS 320-193512/2-A Client ID: \_\_\_\_\_

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

# Column to be used to flag recovery and RPD values

FORM III  
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2017.11.13\_537A\_009.d  
 Lab ID: LCSD 320-193512/3-A Client ID: \_\_\_\_\_

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

# Column to be used to flag recovery and RPD values

FORM IV  
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Lab File ID: 2017.11.13\_537A\_007.d Lab Sample ID: MB 320-193512/1-A  
 Matrix: Water Date Extracted: 11/08/2017 11:47  
 Instrument ID: A8\_N Date Analyzed: 11/13/2017 02:51  
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

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

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A8\_N Calibration Start Date: 11/03/2017 13:37  
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 11/03/2017 14:01  
 Calibration ID: 36012

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

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 50%-150% of internal standard area  
 RT Limit =  $\pm$  0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-194241/2 Date Analyzed: 11/13/2017 02:41  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.11.13\_537A\_005 Heated Purge: (Y/N) N  
 Calibration ID: 36012

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

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

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

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-194241/14 Date Analyzed: 11/13/2017 03:38  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.11.13\_537A\_017 Heated Purge: (Y/N) N  
 Calibration ID: 36012

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

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

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

RT Limit =  $\pm$  0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-194251/14 Date Analyzed: 11/13/2017 03:38  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.11.13\_537A\_017 Heated Purge: (Y/N) N  
 Calibration ID: 36012

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

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

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

RT Limit =  $\pm$  0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-194251/25 Date Analyzed: 11/13/2017 04:29  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.11.13\_537A\_028 Heated Purge: (Y/N) N  
 Calibration ID: 36012

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

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

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

RT Limit =  $\pm$  0.5 minutes of internal standard RT

# Column used to flag values outside QC limits



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                             |                                              |
|---------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>     | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                              |                                              |
| Client Sample ID: <u>NAWC-110217-RW-286</u> | Lab Sample ID: <u>320-33018-1</u>            |
| Matrix: <u>Water</u>                        | Lab File ID: <u>2017.11.13_537A_010.d</u>    |
| Analysis Method: <u>537</u>                 | Date Collected: <u>11/02/2017 08:10</u>      |
| Extraction Method: <u>537</u>               | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>242.3 (mL)</u>            | Date Analyzed: <u>11/13/2017 03:05</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>         | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>             | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                           | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194241</u>           | Units: <u>ng/L</u>                           |

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

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_010.d  
 Lims ID: 320-33018-A-1-A  
 Client ID: NAWC-110217-RW-286  
 Sample Type: Client  
 Inject. Date: 13-Nov-2017 03:05:17 ALS Bottle#: 4 Worklist Smp#: 7  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-33018-a-1-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK010

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

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

## QC Flag Legend

### Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_010.d

Injection Date: 13-Nov-2017 03:05:17

Instrument ID: A8\_N

Lims ID: 320-33018-A-1-A

Lab Sample ID: 320-33018-1

Client ID: NAWC-110217-RW-286

Operator ID: SACINSTLCMS01

ALS Bottle#: 4

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

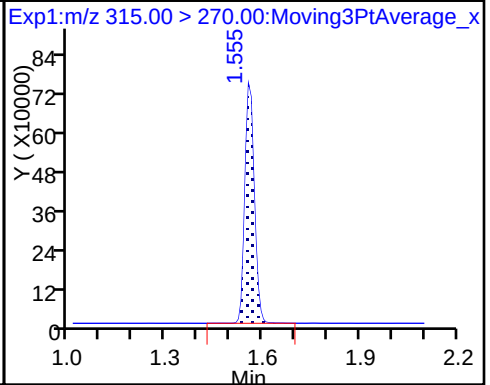
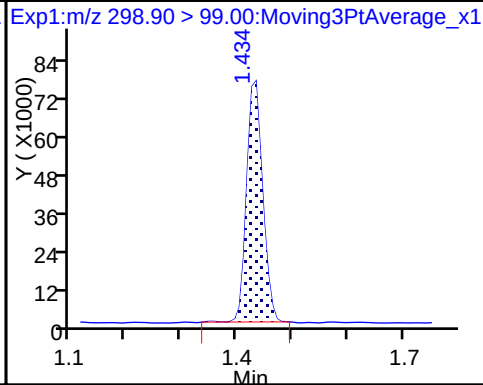
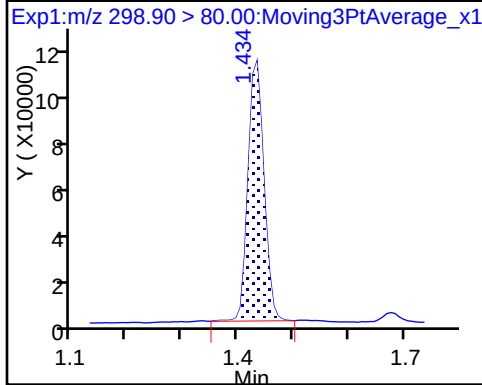
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

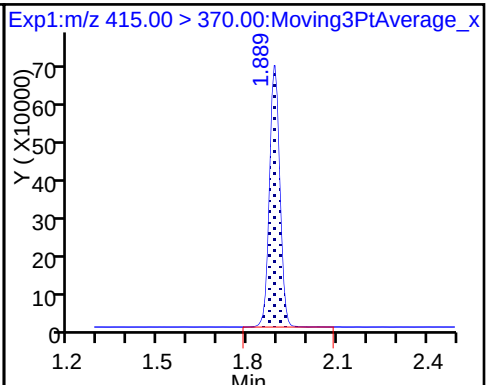
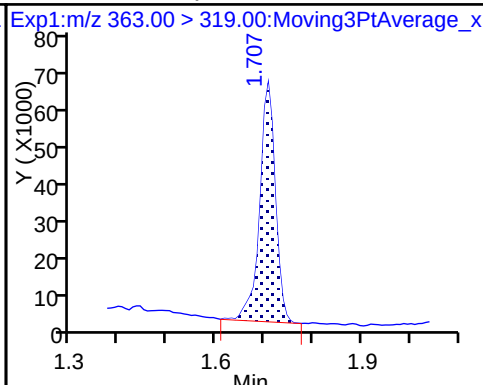
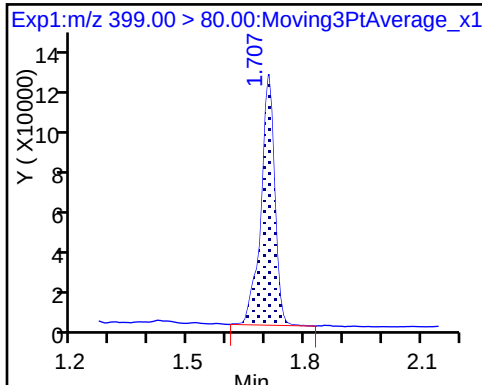
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

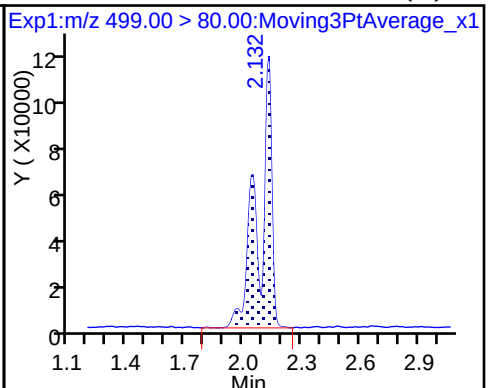
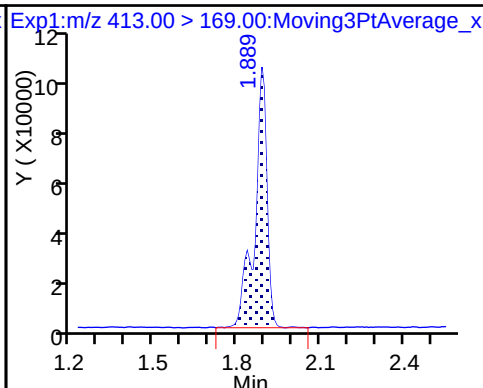
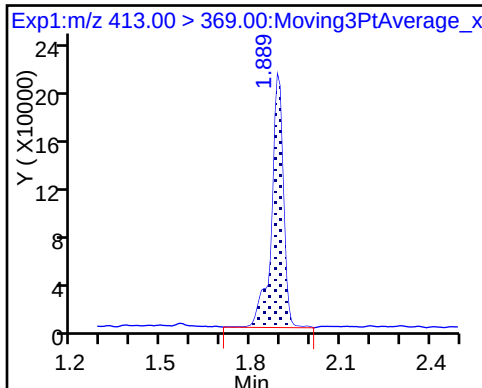
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

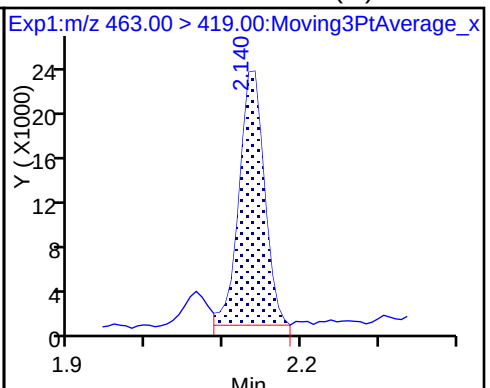
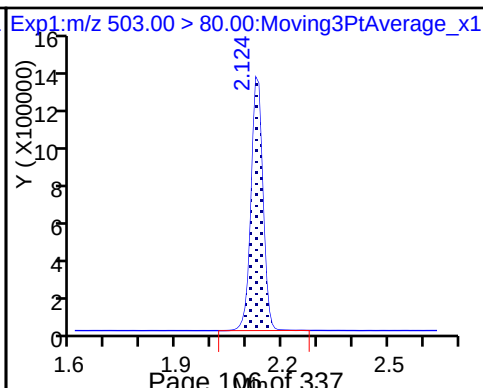
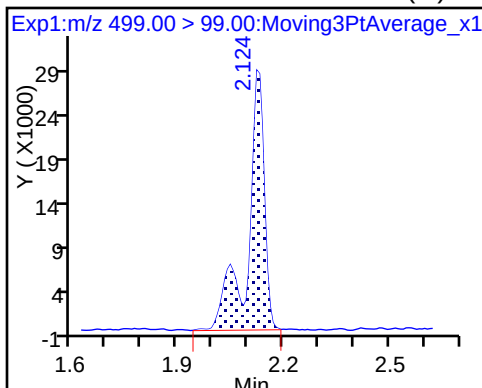
8 Perfluorooctane sulfonic acid (M)



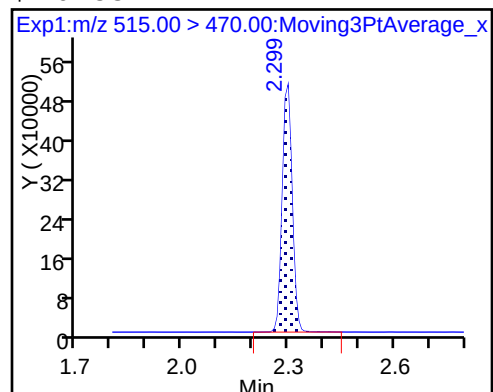
8 Perfluorooctane sulfonic acid (M)

\* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_010.d  
Lims ID: 320-33018-A-1-A  
Client ID: NAWC-110217-RW-286  
Sample Type: Client  
Inject. Date: 13-Nov-2017 03:05:17 ALS Bottle#: 4 Worklist Smp#: 7  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-33018-a-1-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
Column 1 : Det: EXP1  
Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 16:55:43

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

## TestAmerica Sacramento

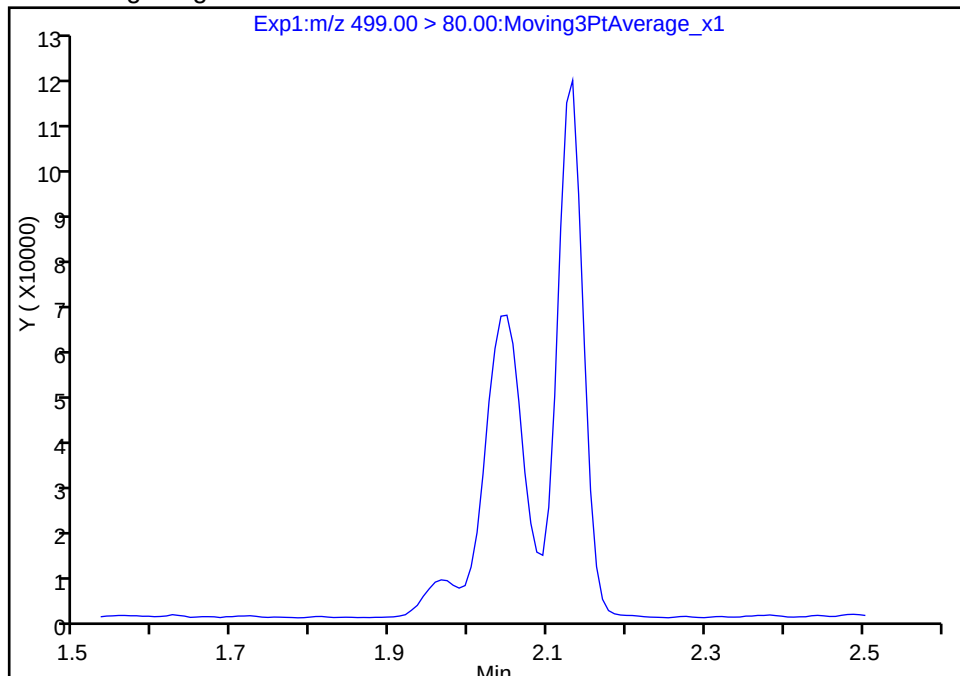
|                 |                                                                            |                |             |                |   |
|-----------------|----------------------------------------------------------------------------|----------------|-------------|----------------|---|
| Data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

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

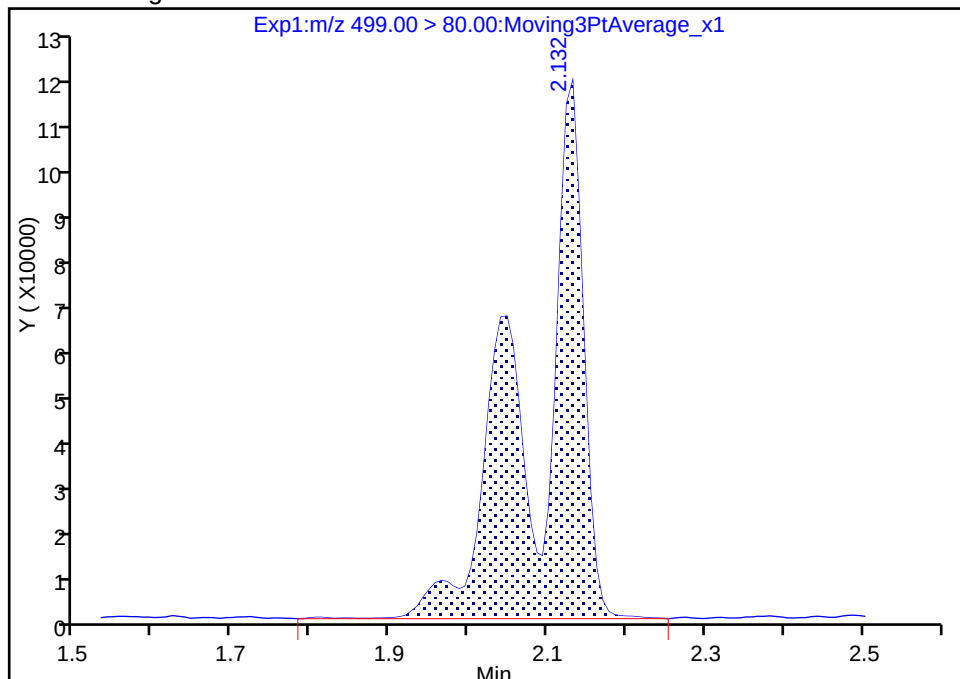
Signal: 1

Not Detected  
Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results



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

Reviewer: barnettj, 14-Nov-2017 16:55:20

Audit Action: Assigned Compound ID

Audit Reason: Isomers

## TestAmerica Sacramento

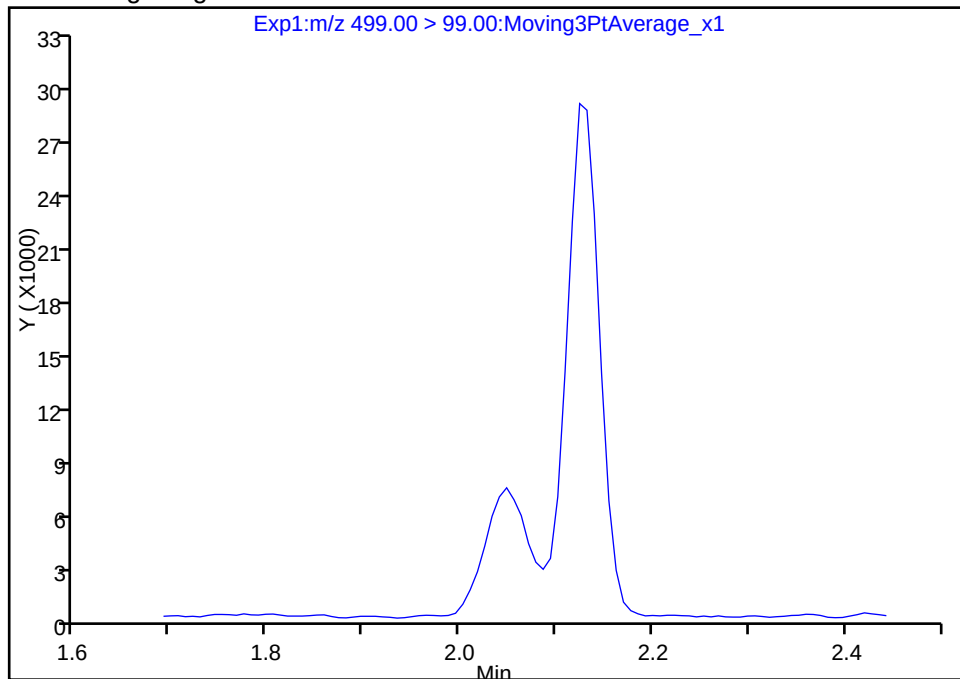
|                 |                                                                            |                |             |                |   |
|-----------------|----------------------------------------------------------------------------|----------------|-------------|----------------|---|
| Data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

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

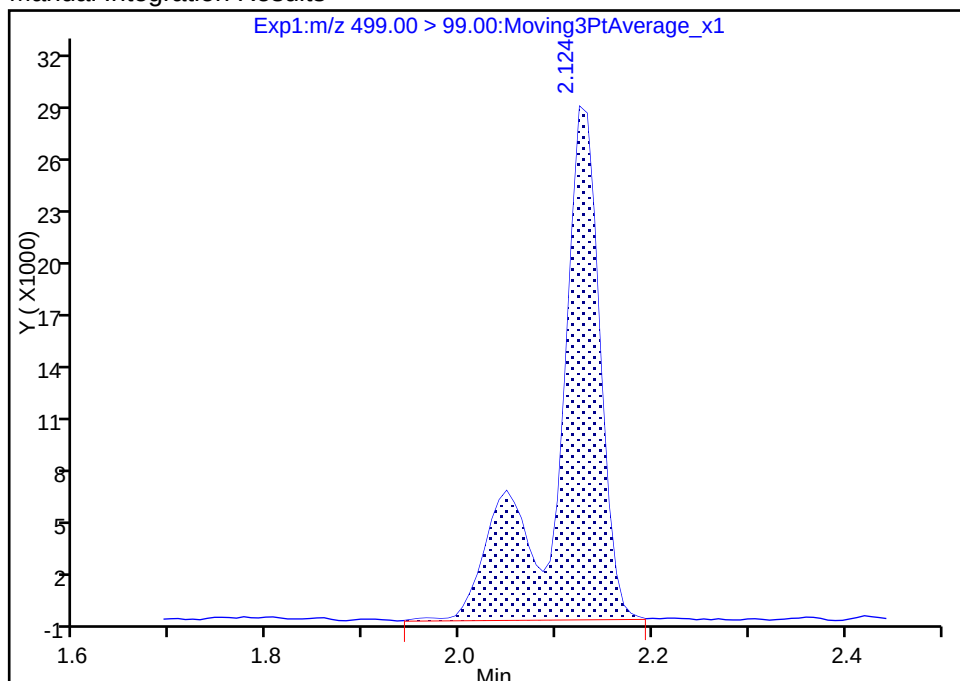
Signal: 2

Not Detected  
Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results

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

Reviewer: barnettj, 14-Nov-2017 16:55:34

Audit Action: Manually Integrated

Audit Reason: Isomers



## TestAmerica Sacramento

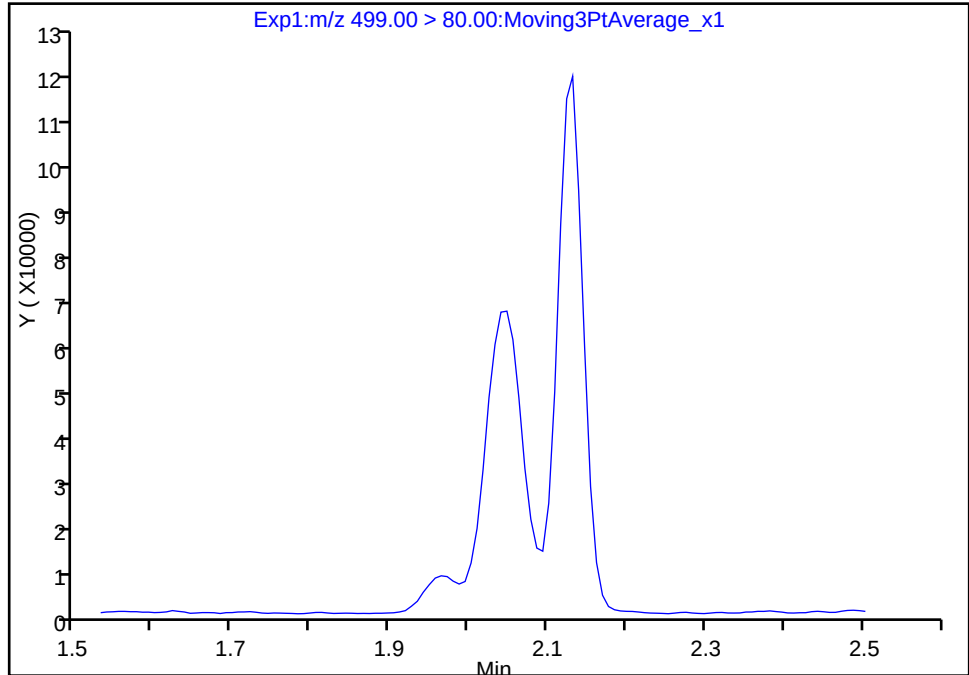
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_010.d  
Injection Date: 13-Nov-2017 03:05:17 Instrument ID: A8\_N  
Lims ID: 320-33018-A-1-A Lab Sample ID: 320-33018-1  
Client ID: NAWC-110217-RW-286  
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

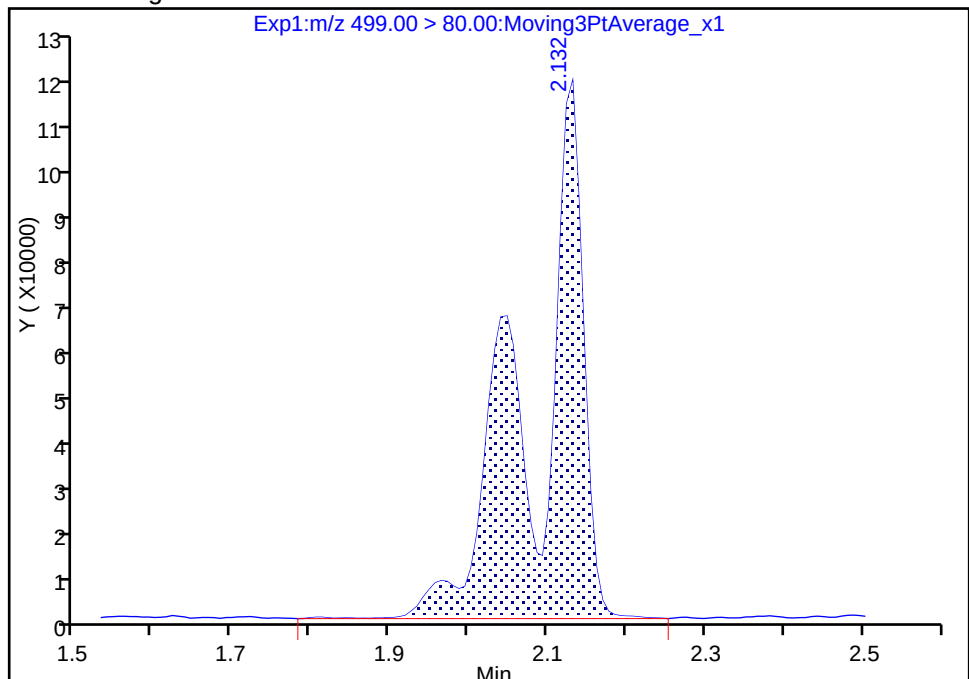
Not Detected  
Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results

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



Reviewer: barnettj, 14-Nov-2017 16:55:34

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_010.d

Injection Date: 13-Nov-2017 03:05:17

Instrument ID: A8\_N

Lims ID: 320-33018-A-1-A

Lab Sample ID: 320-33018-1

Client ID: NAWC-110217-RW-286

Operator ID: SACINSTLCMS01

ALS Bottle#: 4 Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537\_A8\_N

Limit Group: LC 537 ICAL

Column:

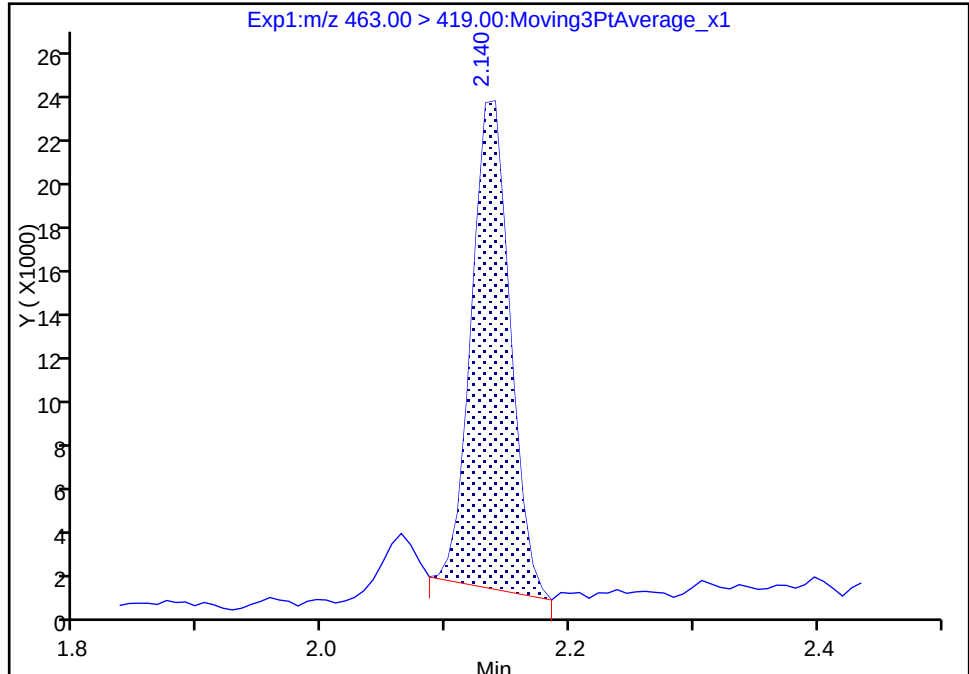
Detector EXP1

**9 Perfluorononanoic acid, CAS: 375-95-1**

Signal: 1

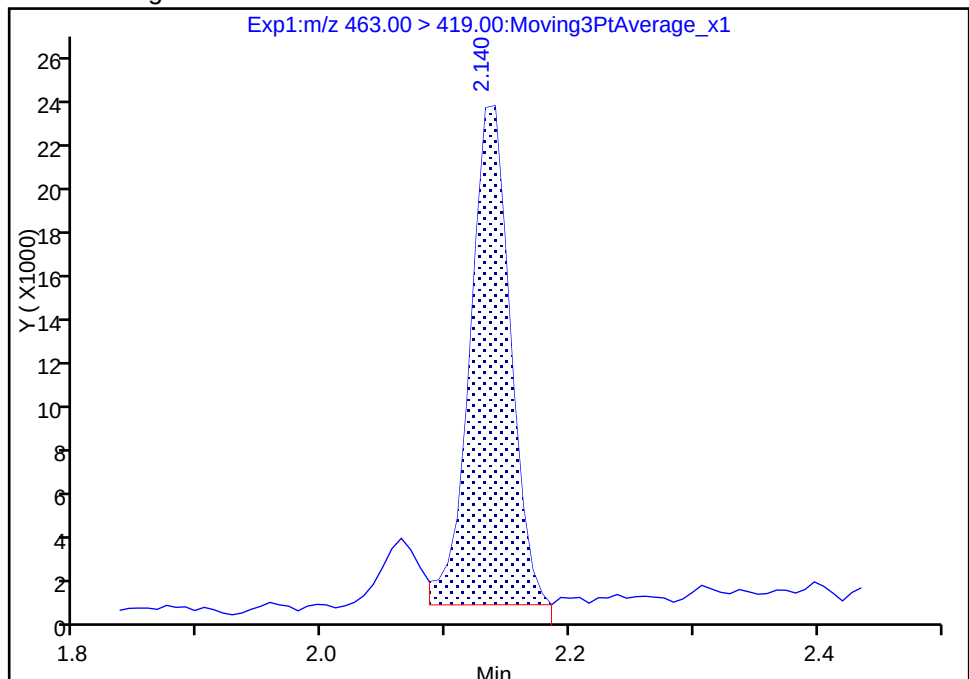
RT: 2.14  
Area: 47317  
Amount: 0.442391  
Amount Units: ng/ml

## Processing Integration Results



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

## Manual Integration Results



Reviewer: barnettj, 14-Nov-2017 16:57:33

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                              |
|----------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                               |                                              |
| Client Sample ID: <u>NAWC-110217-FRB-286</u> | Lab Sample ID: <u>320-33018-2</u>            |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2017.11.13_537A_011.d</u>    |
| Analysis Method: <u>537</u>                  | Date Collected: <u>11/02/2017 08:05</u>      |
| Extraction Method: <u>537</u>                | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>243.9 (mL)</u>             | Date Analyzed: <u>11/13/2017 03:09</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>          | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>              | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194241</u>            | Units: <u>ng/L</u>                           |

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

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_011.d  
 Lims ID: 320-33018-A-2-A  
 Client ID: NAWC-110217-FRB-286  
 Sample Type: Client  
 Inject. Date: 13-Nov-2017 03:09:57 ALS Bottle#: 5 Worklist Smp#: 8  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-33018-a-2-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

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

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_011.d

Injection Date: 13-Nov-2017 03:09:57

Instrument ID: A8\_N

Lims ID: 320-33018-A-2-A

Lab Sample ID: 320-33018-2

Client ID: NAWC-110217-FRB-286

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

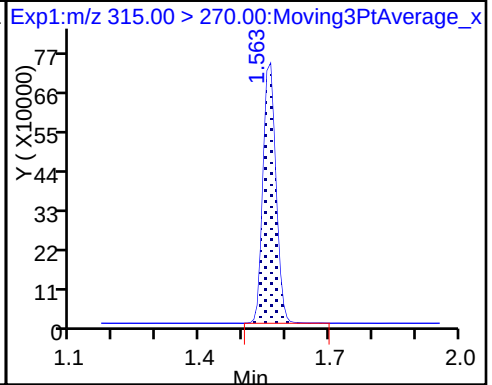
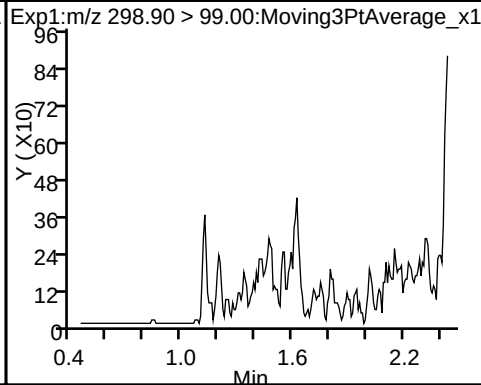
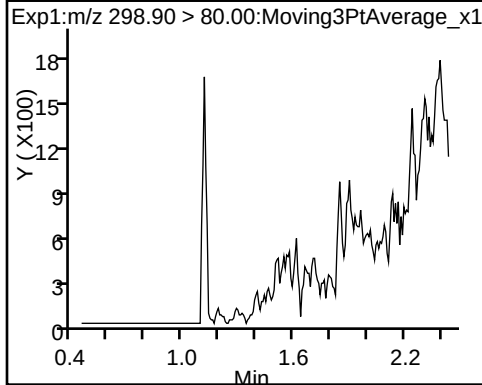
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

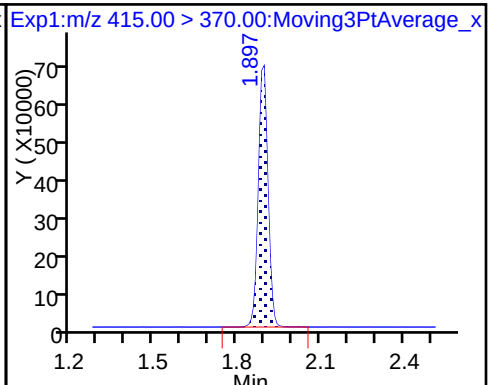
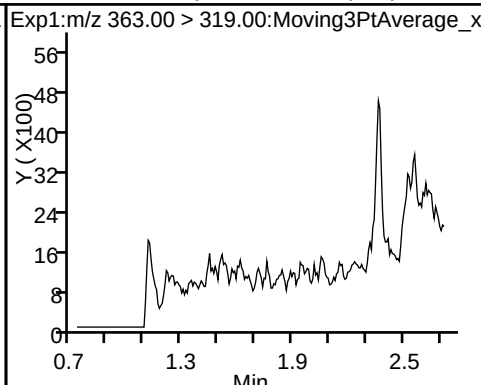
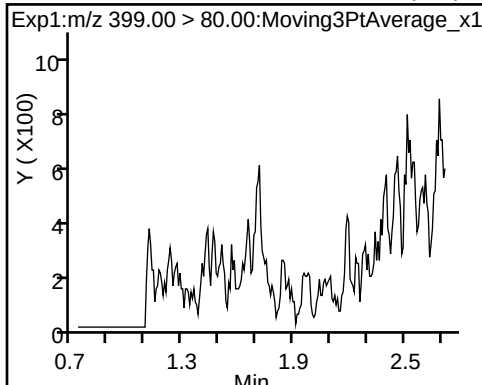
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

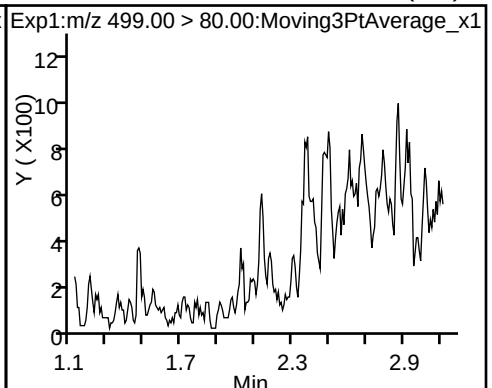
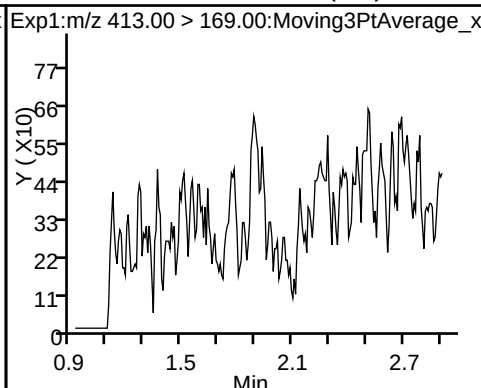
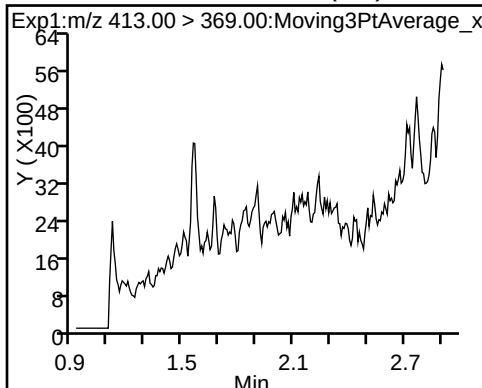
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

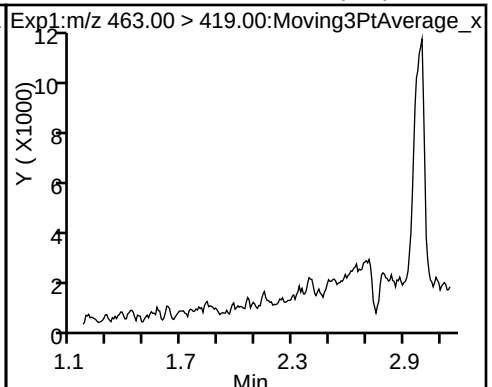
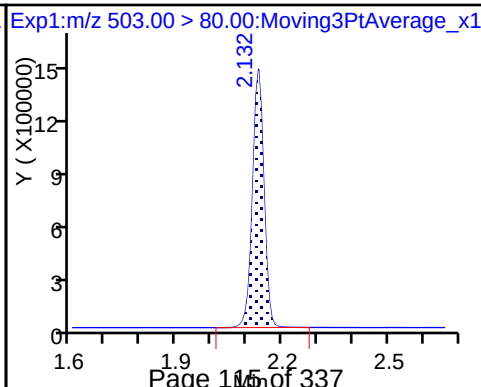
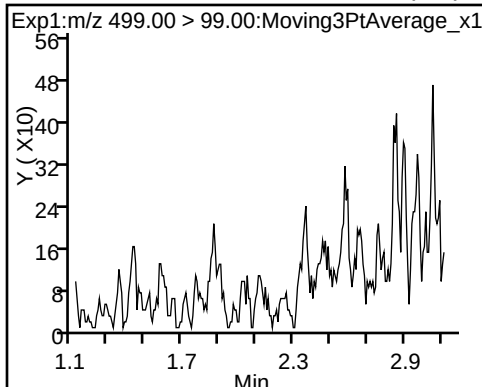
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

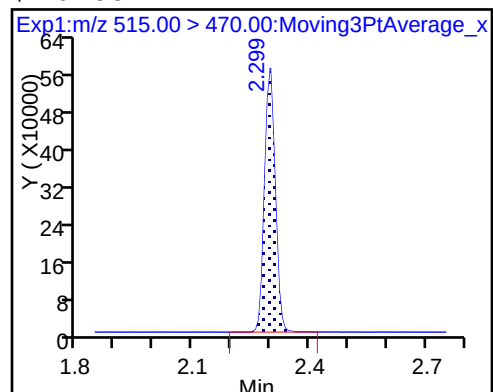


8 Perfluorooctane sulfonic acid (ND) \* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_011.d  
Lims ID: 320-33018-A-2-A  
Client ID: NAWC-110217-FRB-286  
Sample Type: Client  
Inject. Date: 13-Nov-2017 03:09:57 ALS Bottle#: 5 Worklist Smp#: 8  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-33018-a-2-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                             |
|----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-33018-1</u>                 |
| SDG No.: _____                               |                                             |
| Client Sample ID: <u>WGNA-110217-RW-3978</u> | Lab Sample ID: <u>320-33018-3</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2017.11.13_537A_012.d</u>   |
| Analysis Method: <u>537</u>                  | Date Collected: <u>11/02/2017 08:40</u>     |
| Extraction Method: <u>537</u>                | Date Extracted: <u>11/08/2017 11:47</u>     |
| Sample wt/vol: <u>245.7(mL)</u>              | Date Analyzed: <u>11/13/2017 03:14</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>           | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>194241</u>            | Units: <u>ng/L</u>                          |

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

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



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_012.d  
 Lims ID: 320-33018-A-3-A  
 Client ID: WGNA-110217-RW-3978  
 Sample Type: Client  
 Inject. Date: 13-Nov-2017 03:14:37 ALS Bottle#: 6 Worklist Smp#: 9  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-33018-a-3-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 16:58:47

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

## QC Flag Legend

### Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_012.d

Injection Date: 13-Nov-2017 03:14:37

Instrument ID: A8\_N

Lims ID: 320-33018-A-3-A

Lab Sample ID: 320-33018-3

Client ID: WGNA-110217-RW-3978

Operator ID: SACINSTLCMS01

ALS Bottle#: 6

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

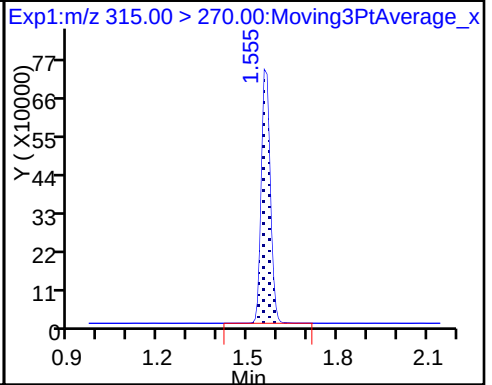
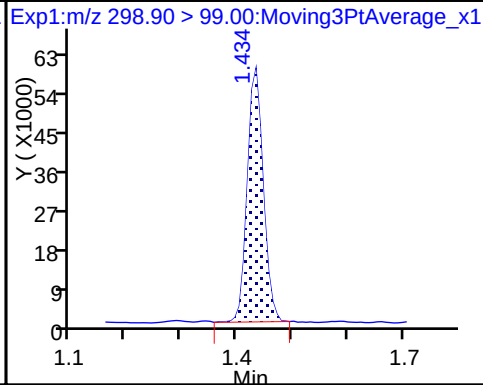
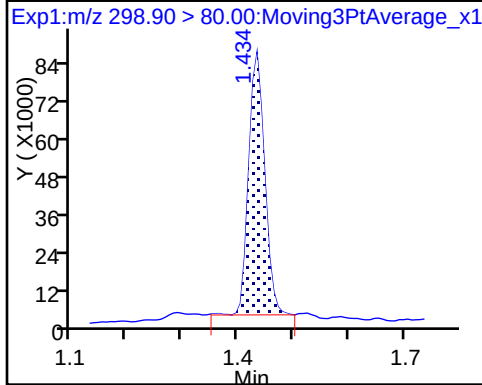
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

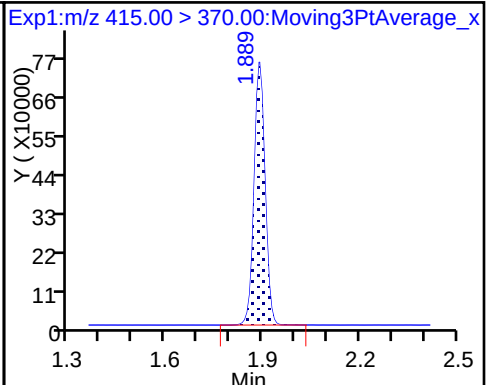
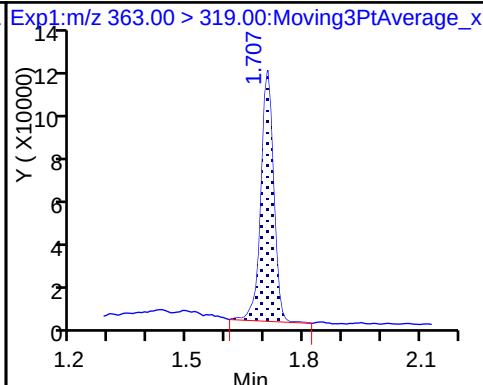
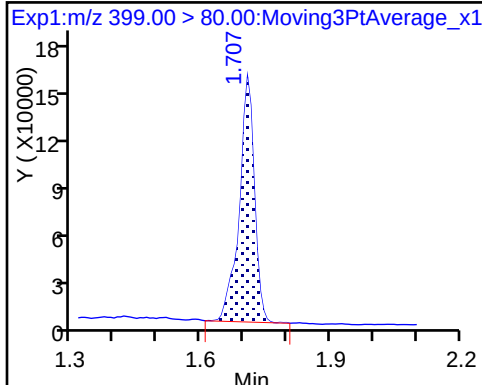
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

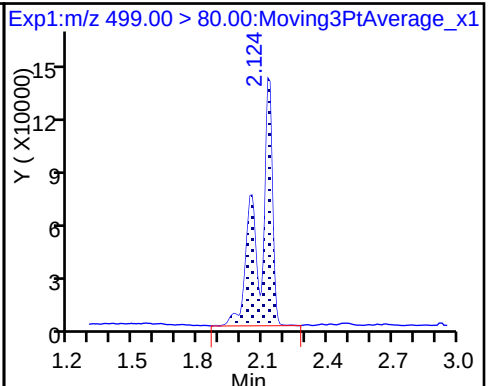
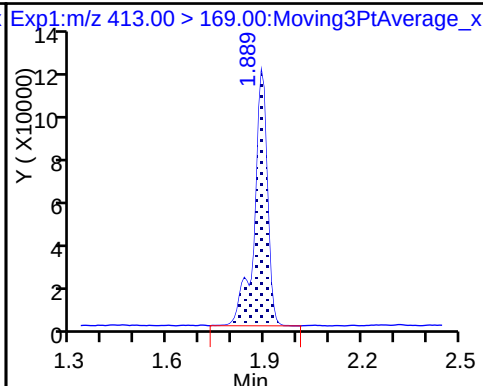
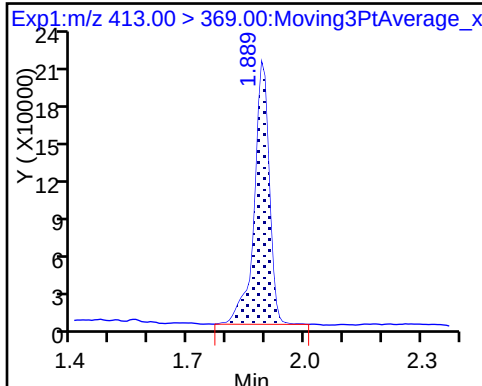
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

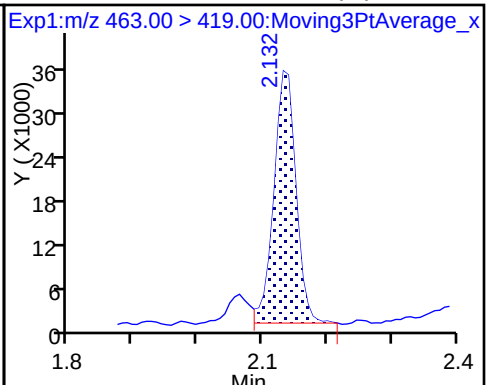
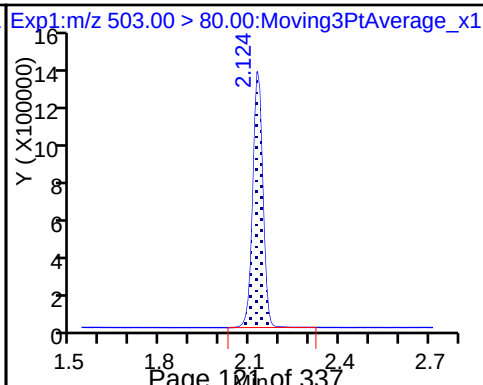
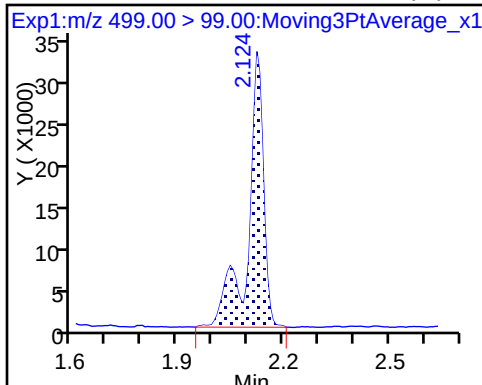
8 Perfluorooctane sulfonic acid (M)



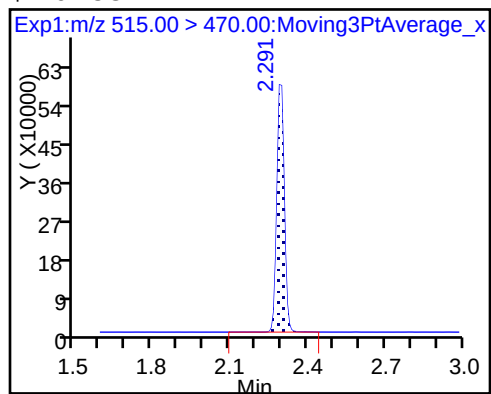
8 Perfluorooctane sulfonic acid (M)

\* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_012.d  
Lims ID: 320-33018-A-3-A  
Client ID: WGNA-110217-RW-3978  
Sample Type: Client  
Inject. Date: 13-Nov-2017 03:14:37 ALS Bottle#: 6 Worklist Smp#: 9  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-33018-a-3-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
Column 1 : Det: EXP1  
Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 16:58:47

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

## TestAmerica Sacramento

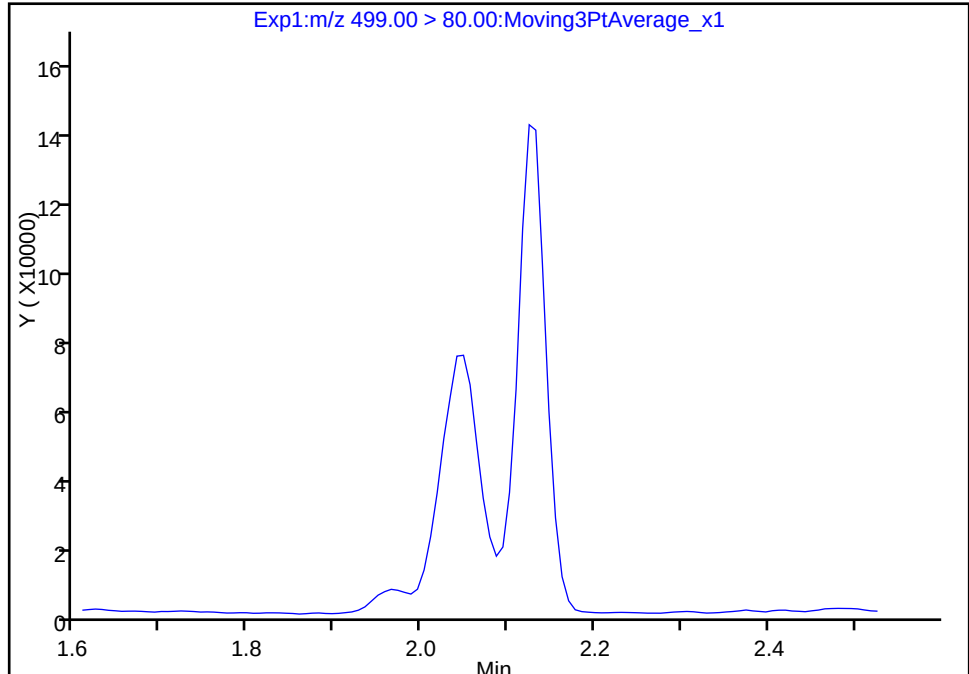
|                 |                                                                            |                |             |                |   |
|-----------------|----------------------------------------------------------------------------|----------------|-------------|----------------|---|
| Data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

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

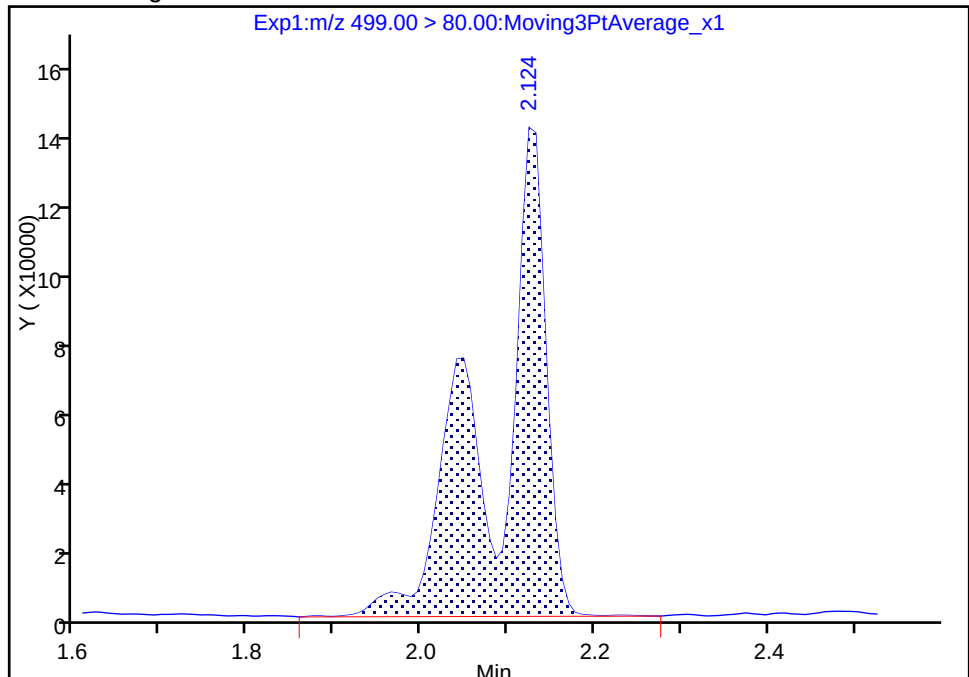
Signal: 1

Not Detected  
Expected RT: 2.12

## Processing Integration Results

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

## Manual Integration Results

Reviewer: barnettj, 14-Nov-2017 16:57:54  
Audit Action: Assigned Compound IDAudit Reason: Isomers  
Page 124 of 337

## TestAmerica Sacramento

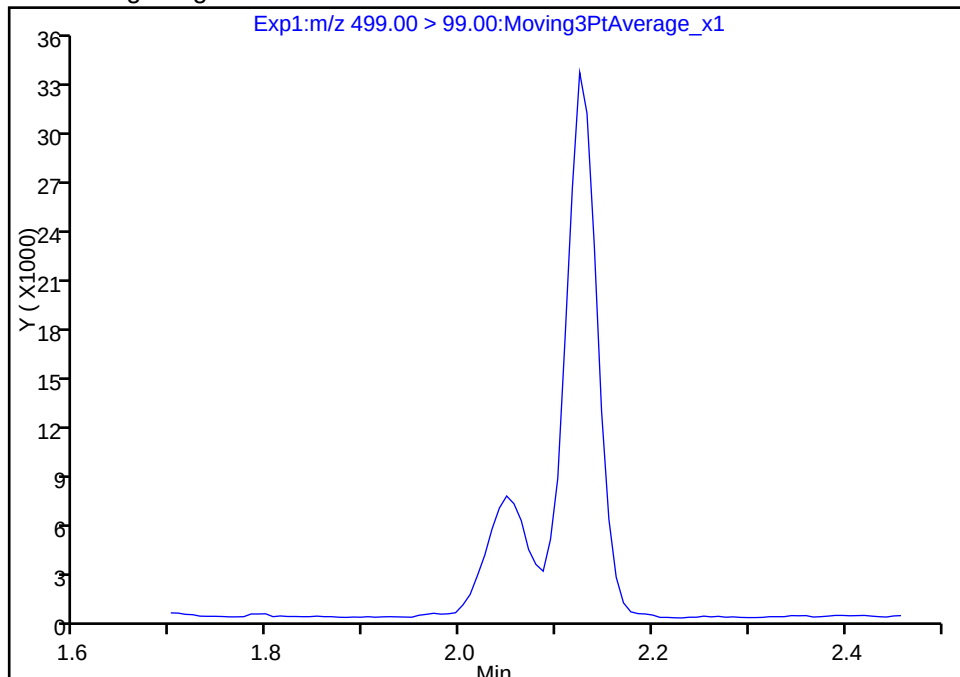
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_012.d  
Injection Date: 13-Nov-2017 03:14:37 Instrument ID: A8\_N  
Lims ID: 320-33018-A-3-A Lab Sample ID: 320-33018-3  
Client ID: WGNA-110217-RW-3978  
Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 9  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 2

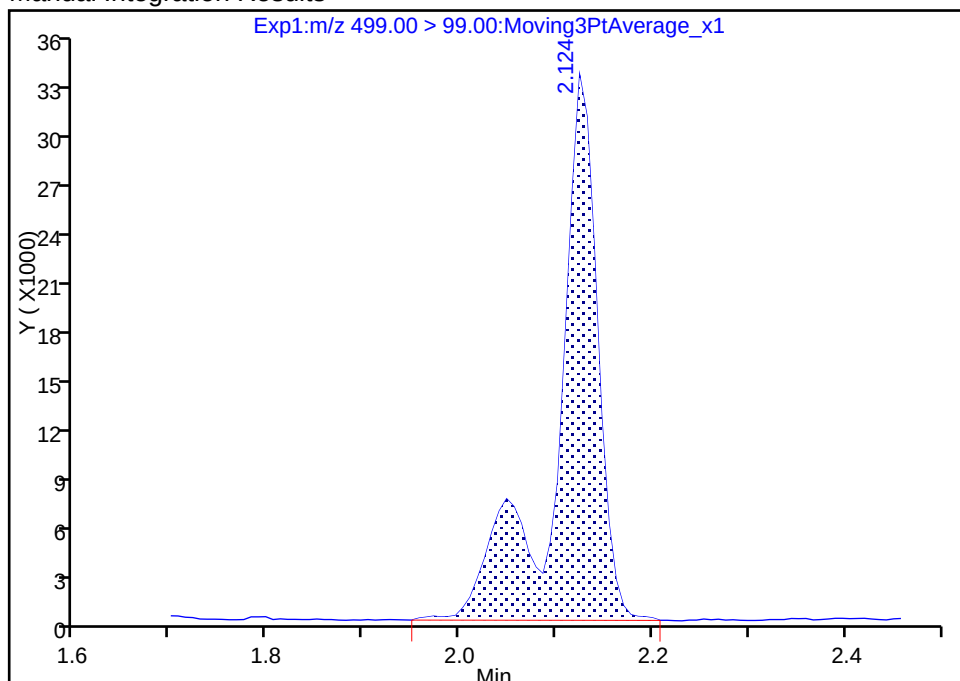
Not Detected  
Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results

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



Reviewer: barnettj, 14-Nov-2017 16:58:05

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

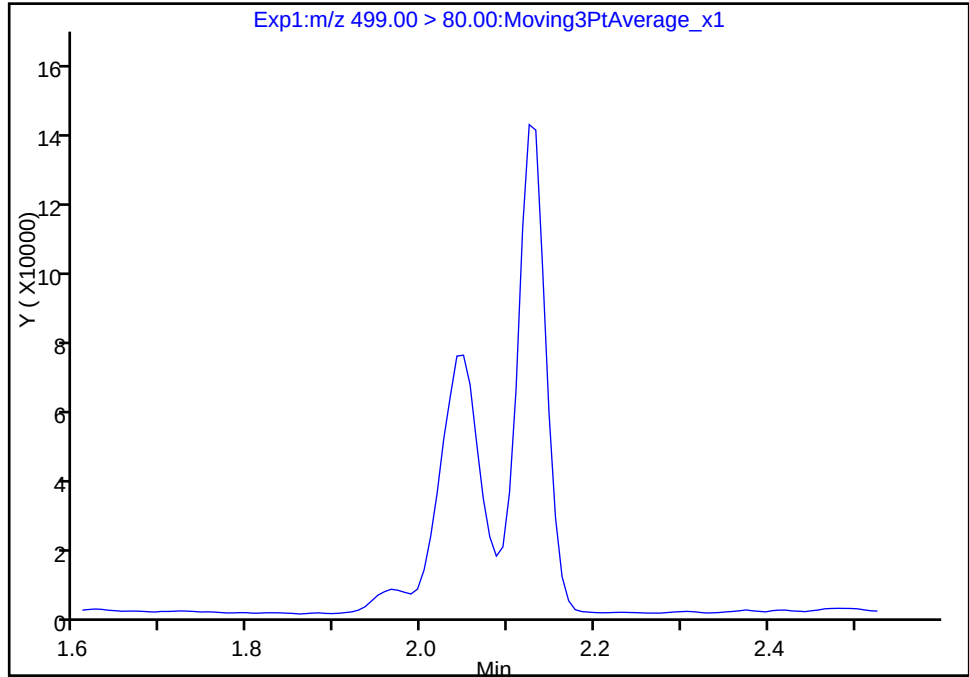
|                 |                                                                            |                |             |                |   |
|-----------------|----------------------------------------------------------------------------|----------------|-------------|----------------|---|
| Data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

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

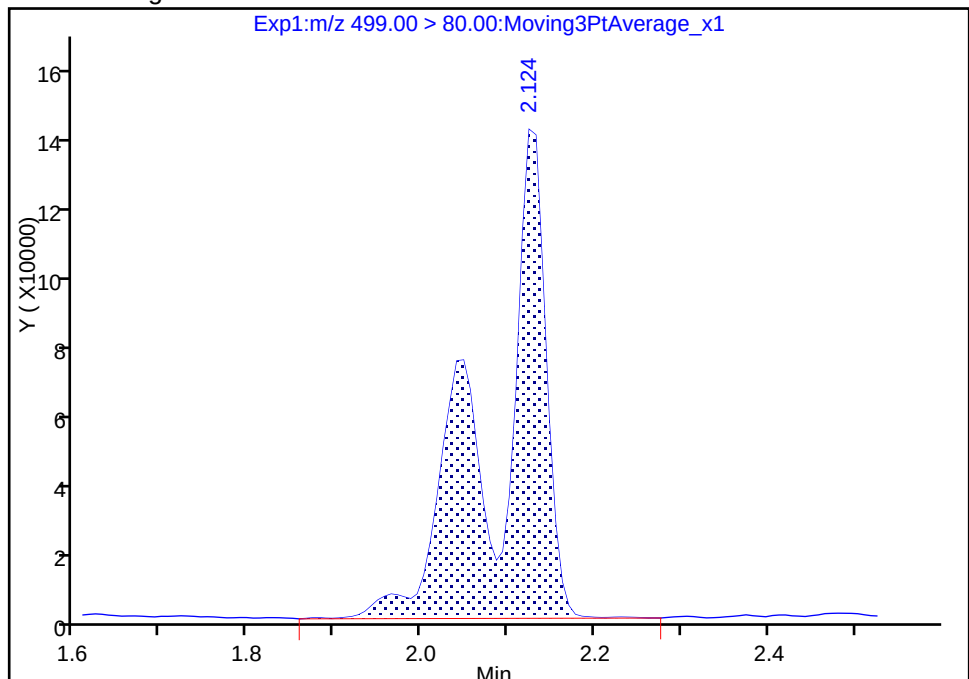
Signal: 1

Not Detected  
Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results

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

Reviewer: barnettj, 14-Nov-2017 16:58:05

Audit Action: Manually Integrated

Audit Reason: Isomers



## TestAmerica Sacramento

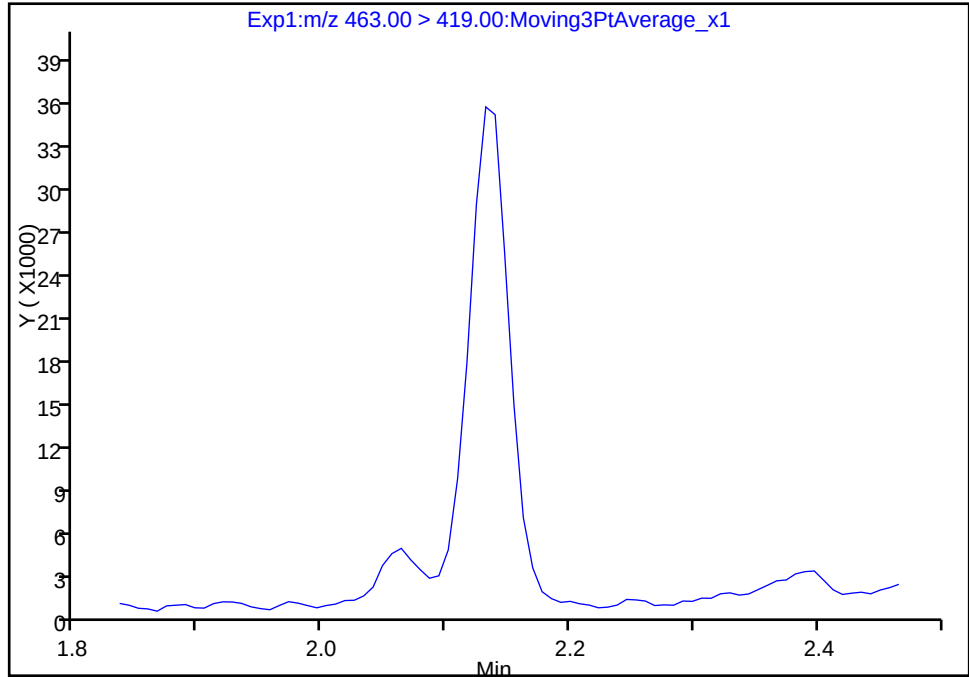
|                 |                                                                            |                |             |                |   |
|-----------------|----------------------------------------------------------------------------|----------------|-------------|----------------|---|
| Data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

**9 Perfluorononanoic acid, CAS: 375-95-1**

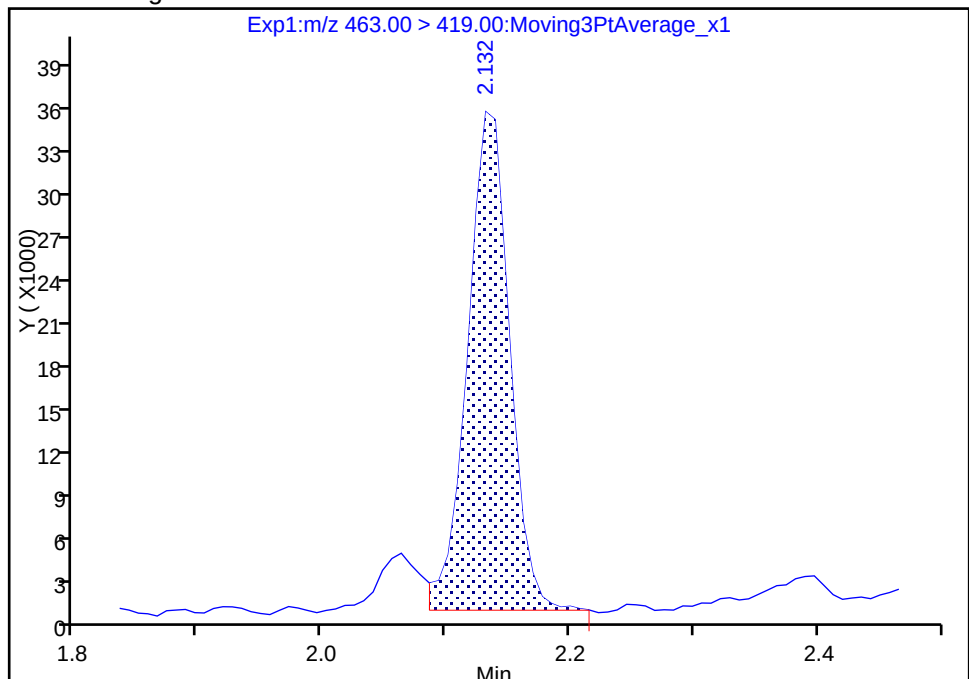
Signal: 1

Not Detected  
Expected RT: 2.16

## Processing Integration Results



## Manual Integration Results

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

Reviewer: barnettj, 14-Nov-2017 16:58:29

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                               |                                              |
|-----------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>       | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                                |                                              |
| Client Sample ID: <u>WGNA-110217-FRB-3978</u> | Lab Sample ID: <u>320-33018-4</u>            |
| Matrix: <u>Water</u>                          | Lab File ID: <u>2017.11.13_537A_013.d</u>    |
| Analysis Method: <u>537</u>                   | Date Collected: <u>11/02/2017 08:35</u>      |
| Extraction Method: <u>537</u>                 | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>247.4 (mL)</u>              | Date Analyzed: <u>11/13/2017 03:19</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>           | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                             | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194241</u>             | Units: <u>ng/L</u>                           |

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

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_013.d  
 Lims ID: 320-33018-A-4-A  
 Client ID: WGNA-110217-FRB-3978  
 Sample Type: Client  
 Inject. Date: 13-Nov-2017 03:19:19 ALS Bottle#: 7 Worklist Smp#: 10  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-33018-a-4-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

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

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_013.d

Injection Date: 13-Nov-2017 03:19:19

Instrument ID: A8\_N

Lims ID: 320-33018-A-4-A

Lab Sample ID: 320-33018-4

Client ID: WGNA-110217-FRB-3978

Operator ID: SACINSTLCMS01

ALS Bottle#: 7

Worklist Smp#: 10

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

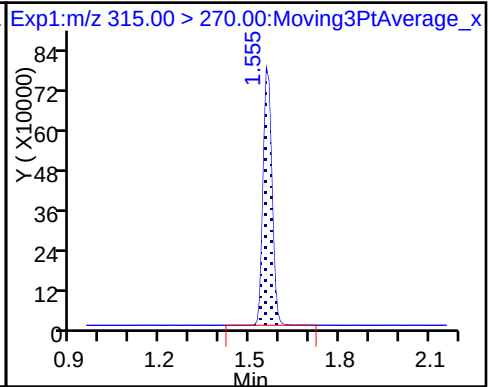
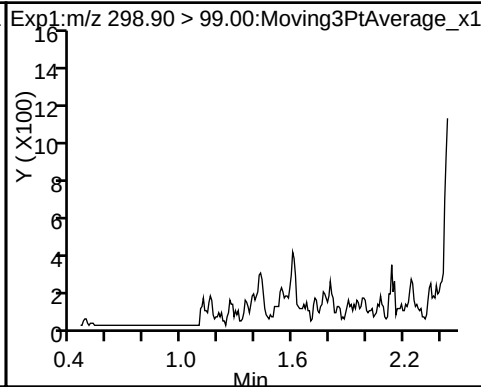
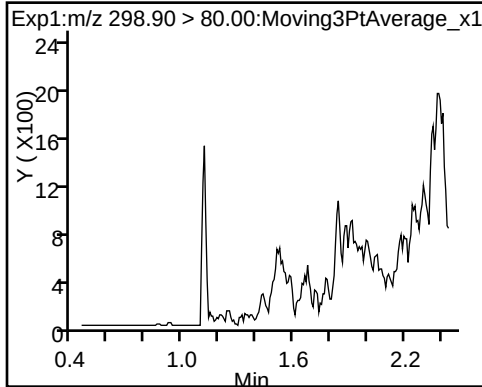
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

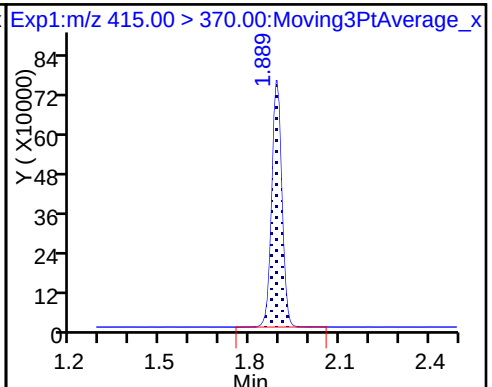
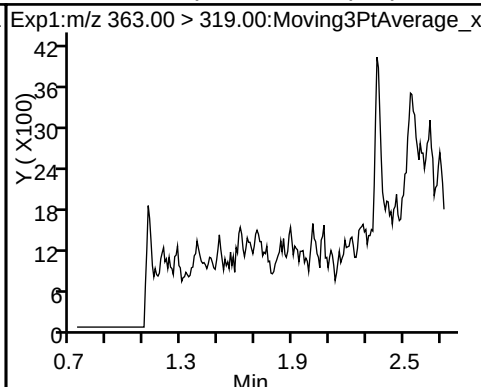
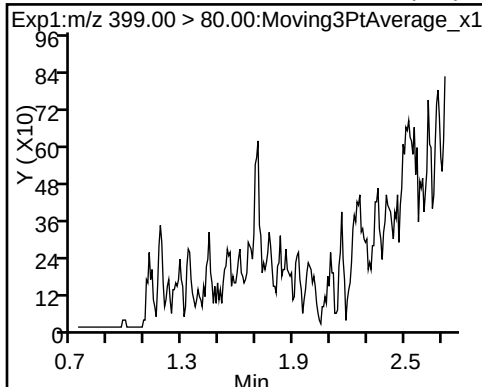
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

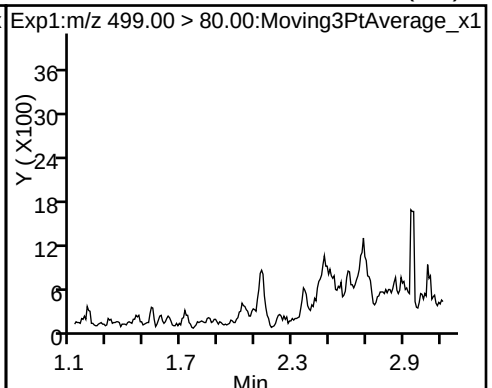
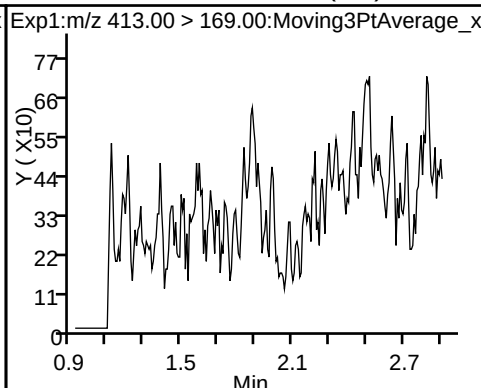
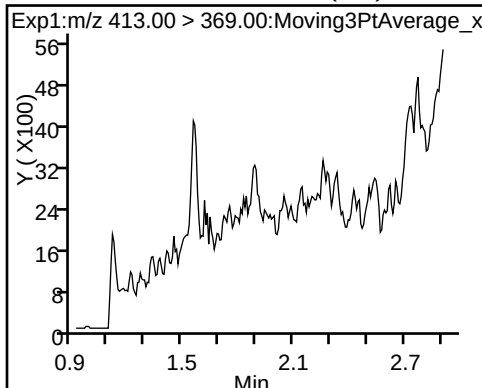
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

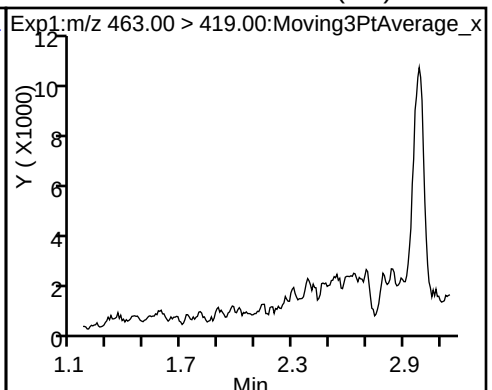
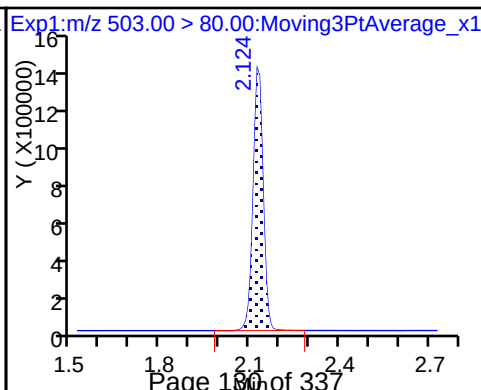
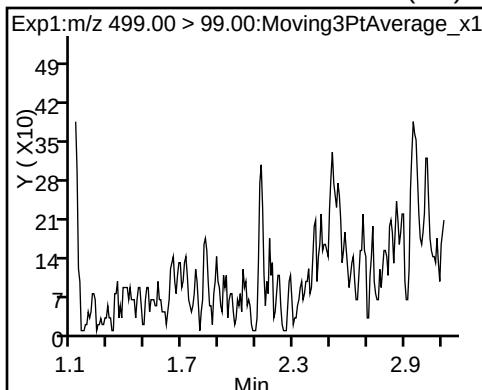
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

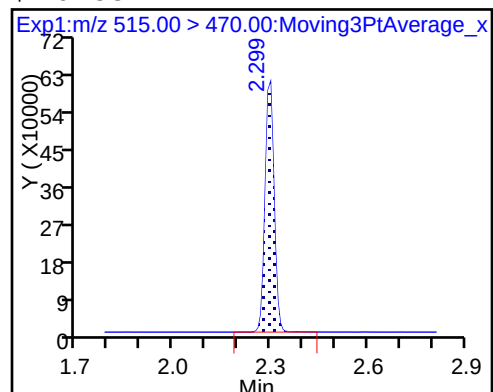


8 Perfluorooctane sulfonic acid (ND) \* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_013.d  
Lims ID: 320-33018-A-4-A  
Client ID: WGNA-110217-FRB-3978  
Sample Type: Client  
Inject. Date: 13-Nov-2017 03:19:19 ALS Bottle#: 7 Worklist Smp#: 10  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-33018-a-4-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 :

Det: EXP1

Process Host: XAWRK010

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-RW-177-IRR Lab Sample ID: 320-33018-5  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_014.d  
 Analysis Method: 537 Date Collected: 11/02/2017 09:10  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 243.1 (mL) Date Analyzed: 11/13/2017 03:24  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194241 Units: ng/L

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

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_014.d  
 Lims ID: 320-33018-A-5-A  
 Client ID: NAWC-110217-RW-177-IRR  
 Sample Type: Client  
 Inject. Date: 13-Nov-2017 03:24:00 ALS Bottle#: 8 Worklist Smp#: 11  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-33018-a-5-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 17:00:51

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



## QC Flag Legend

### Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_014.d

Injection Date: 13-Nov-2017 03:24:00

Instrument ID: A8\_N

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

Lab Sample ID: 320-33018-5

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

Operator ID: SACINSTLCMS01

ALS Bottle#: 8

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

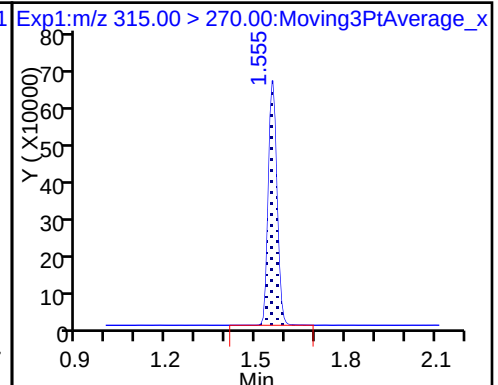
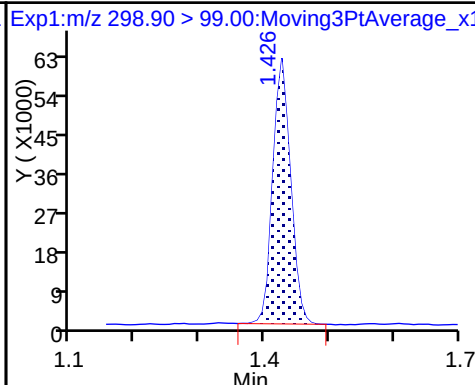
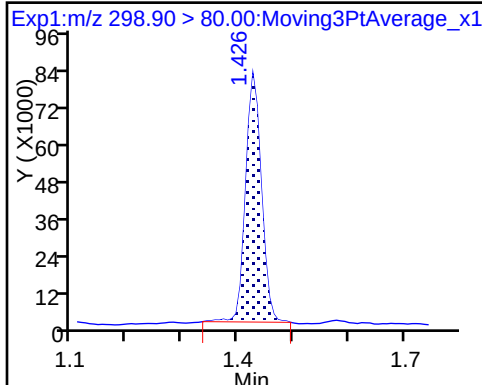
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

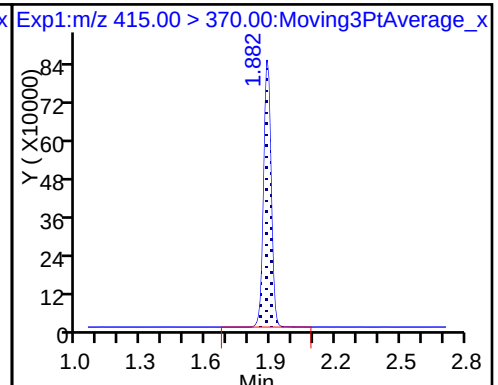
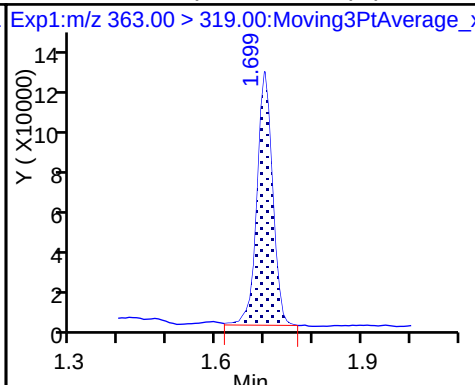
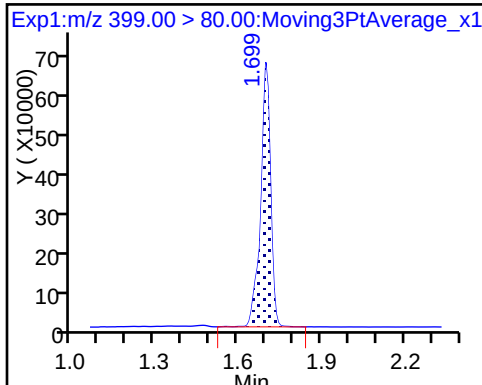
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid (M)

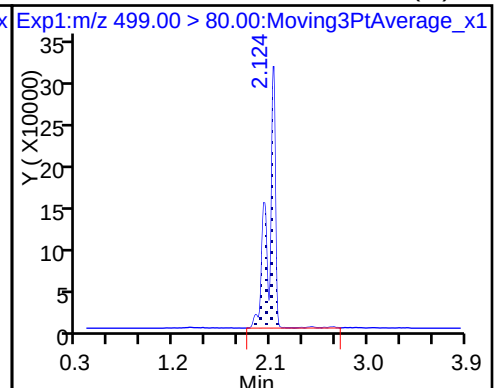
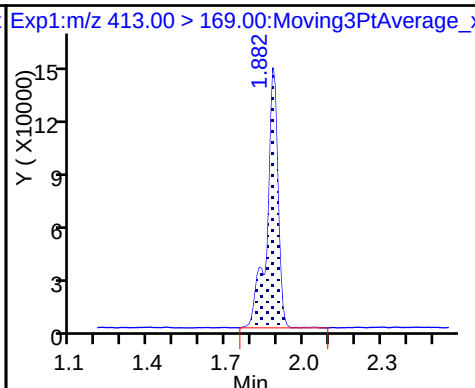
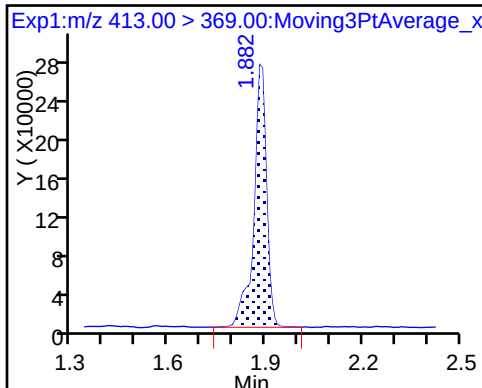
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

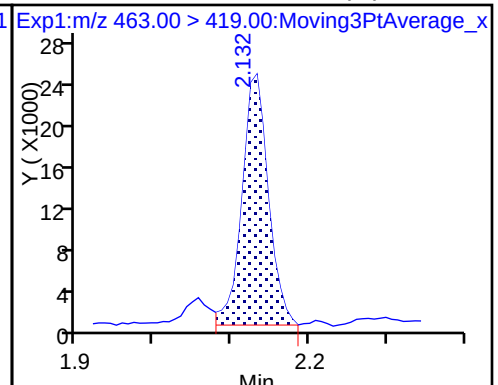
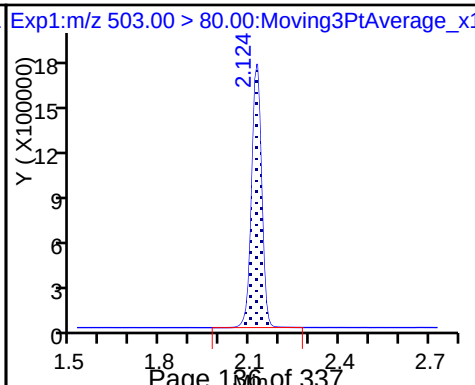
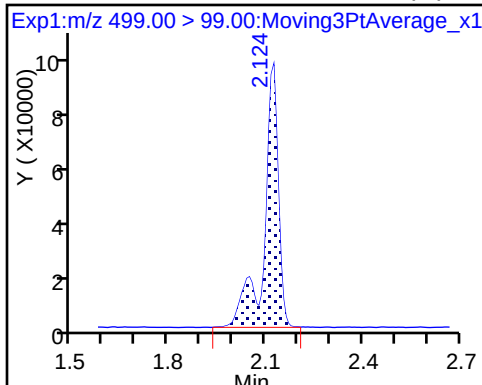
8 Perfluorooctane sulfonic acid (M)



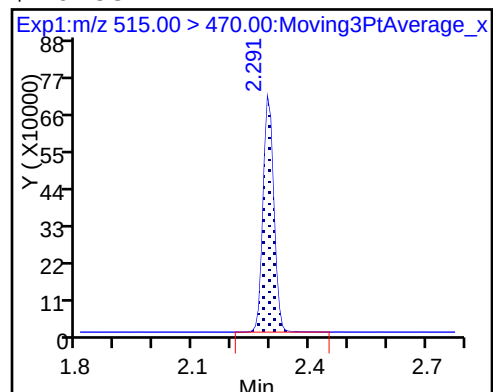
8 Perfluorooctane sulfonic acid (M)

\* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_014.d  
Lims ID: 320-33018-A-5-A  
Client ID: NAWC-110217-RW-177-IRR  
Sample Type: Client  
Inject. Date: 13-Nov-2017 03:24:00 ALS Bottle#: 8 Worklist Smp#: 11  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-33018-a-5-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
Column 1 : Det: EXP1  
Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 17:00:51

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

## TestAmerica Sacramento

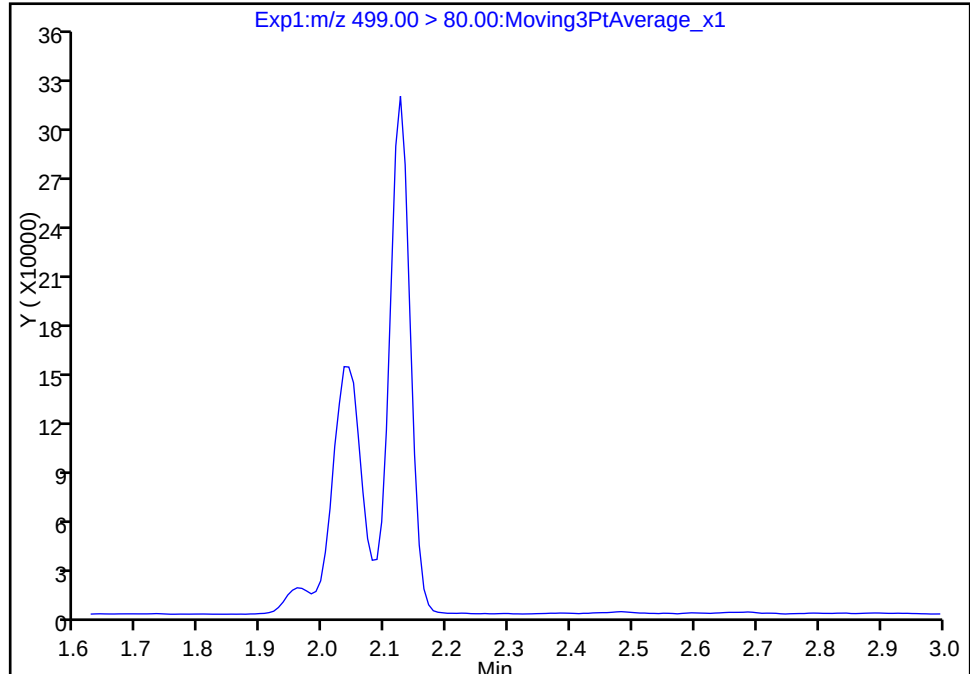
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_014.d  
Injection Date: 13-Nov-2017 03:24:00 Instrument ID: A8\_N  
Lims ID: 320-33018-A-5-A Lab Sample ID: 320-33018-5  
Client ID: NAWC-110217-RW-177-IRR  
Operator ID: SACINSTLCMS01 ALS Bottle#: 8 Worklist Smp#: 11  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

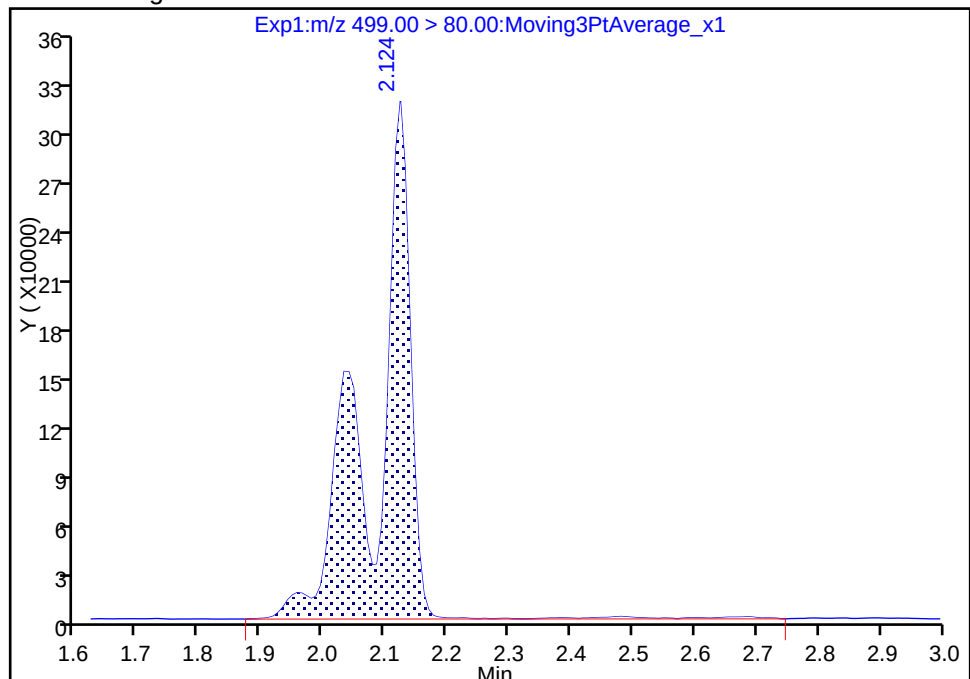
Signal: 1

Not Detected  
Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results



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

## TestAmerica Sacramento

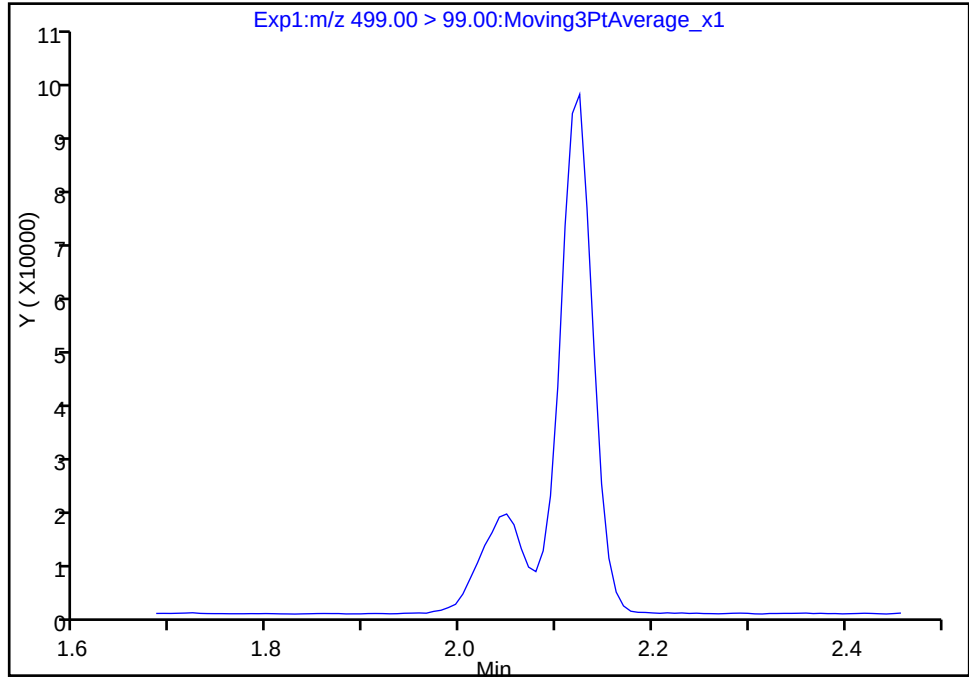
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_014.d  
Injection Date: 13-Nov-2017 03:24:00 Instrument ID: A8\_N  
Lims ID: 320-33018-A-5-A Lab Sample ID: 320-33018-5  
Client ID: NAWC-110217-RW-177-IRR  
Operator ID: SACINSTLCMS01 ALS Bottle#: 8 Worklist Smp#: 11  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 2

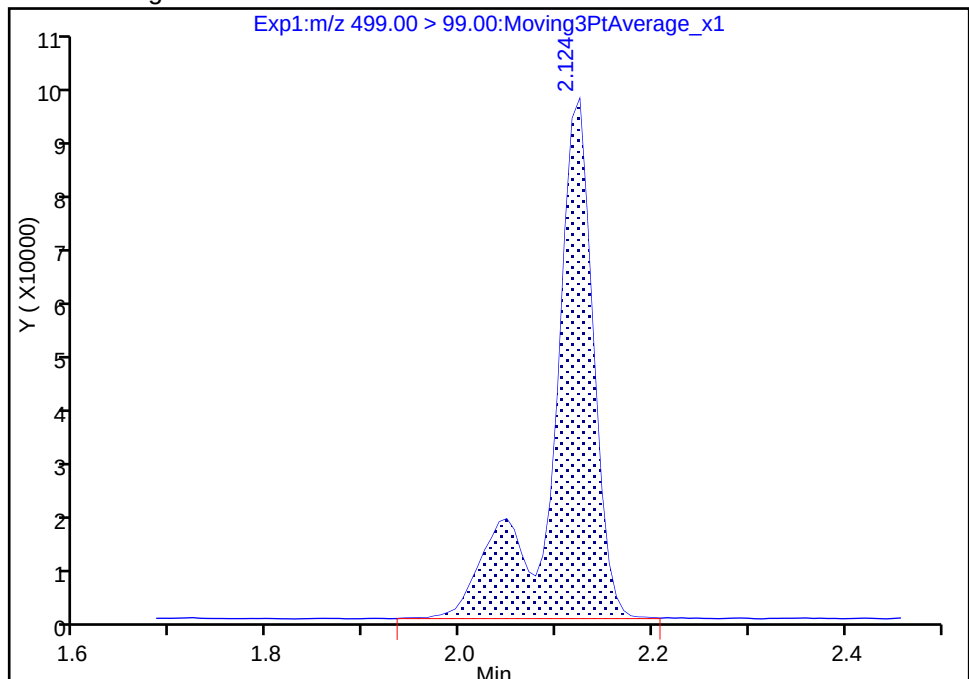
Not Detected  
Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results

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



Reviewer: barnettj, 14-Nov-2017 16:59:40

Audit Action: Manually Integrated

Audit Reason: Missed Peak

## TestAmerica Sacramento

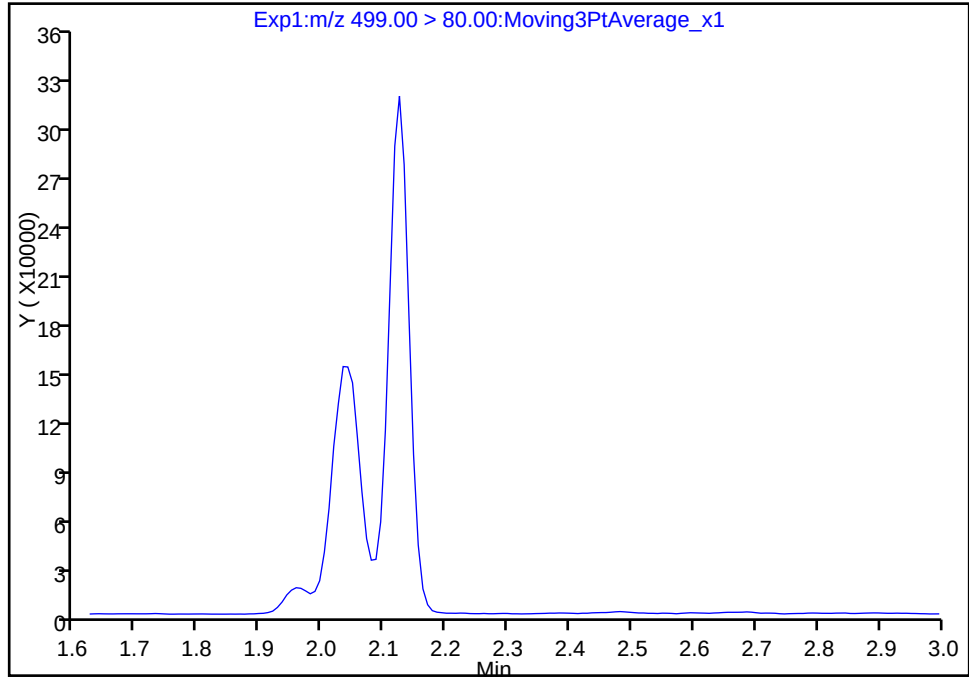
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_014.d  
Injection Date: 13-Nov-2017 03:24:00 Instrument ID: A8\_N  
Lims ID: 320-33018-A-5-A Lab Sample ID: 320-33018-5  
Client ID: NAWC-110217-RW-177-IRR  
Operator ID: SACINSTLCMS01 ALS Bottle#: 8 Worklist Smp#: 11  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

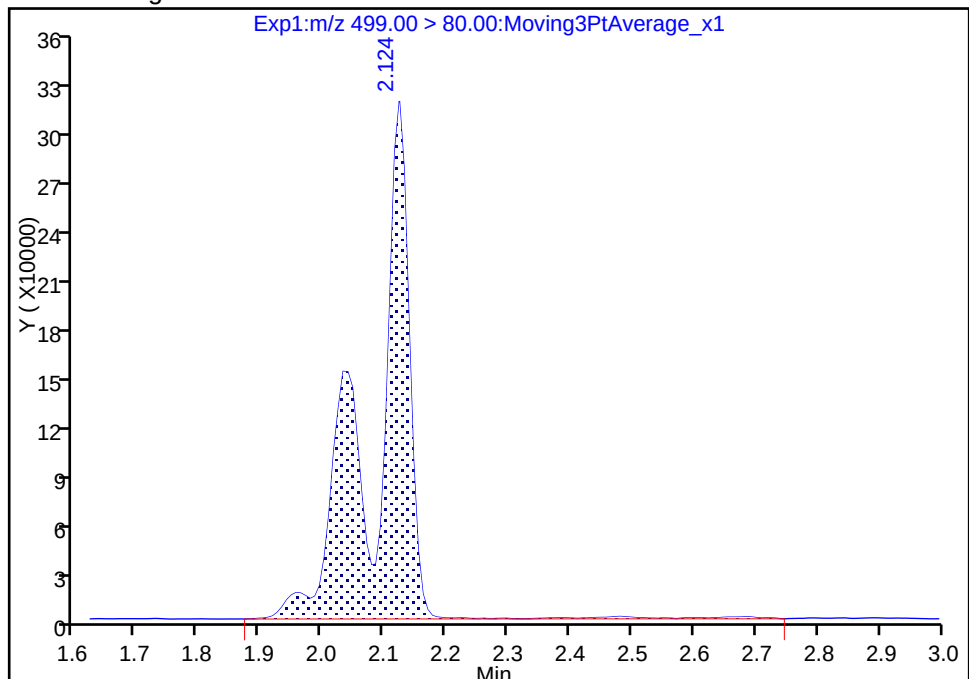
Not Detected  
Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results

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



Reviewer: barnettj, 14-Nov-2017 16:59:40

Audit Action: Manually Integrated

Audit Reason: Missed Peak

## TestAmerica Sacramento

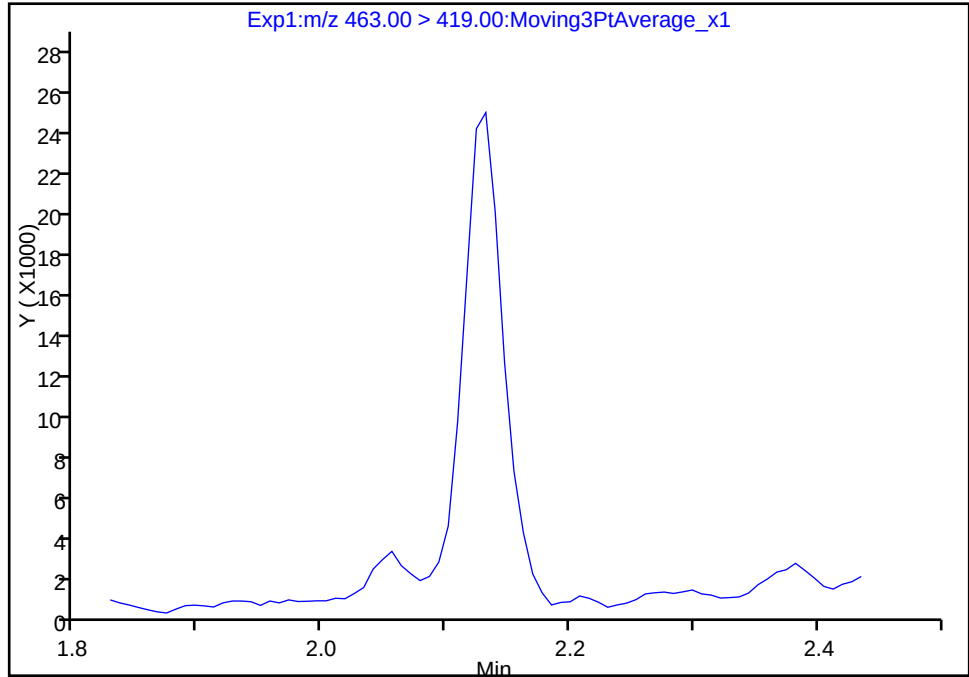
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_014.d  
Injection Date: 13-Nov-2017 03:24:00 Instrument ID: A8\_N  
Lims ID: 320-33018-A-5-A Lab Sample ID: 320-33018-5  
Client ID: NAWC-110217-RW-177-IRR  
Operator ID: SACINSTLCMS01 ALS Bottle#: 8 Worklist Smp#: 11  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

**9 Perfluorononanoic acid, CAS: 375-95-1**

Signal: 1

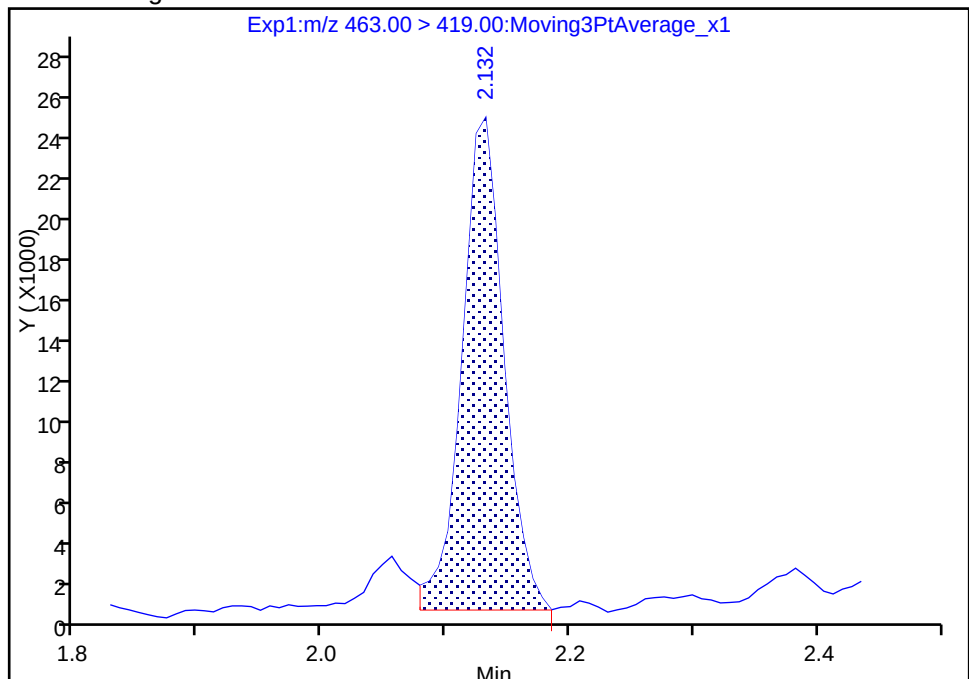
Not Detected  
Expected RT: 2.16

## Processing Integration Results



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

## Manual Integration Results



Reviewer: barnettj, 14-Nov-2017 17:00:42

Audit Action: Manually Integrated

Audit Reason: Missed Peak



## TestAmerica Sacramento

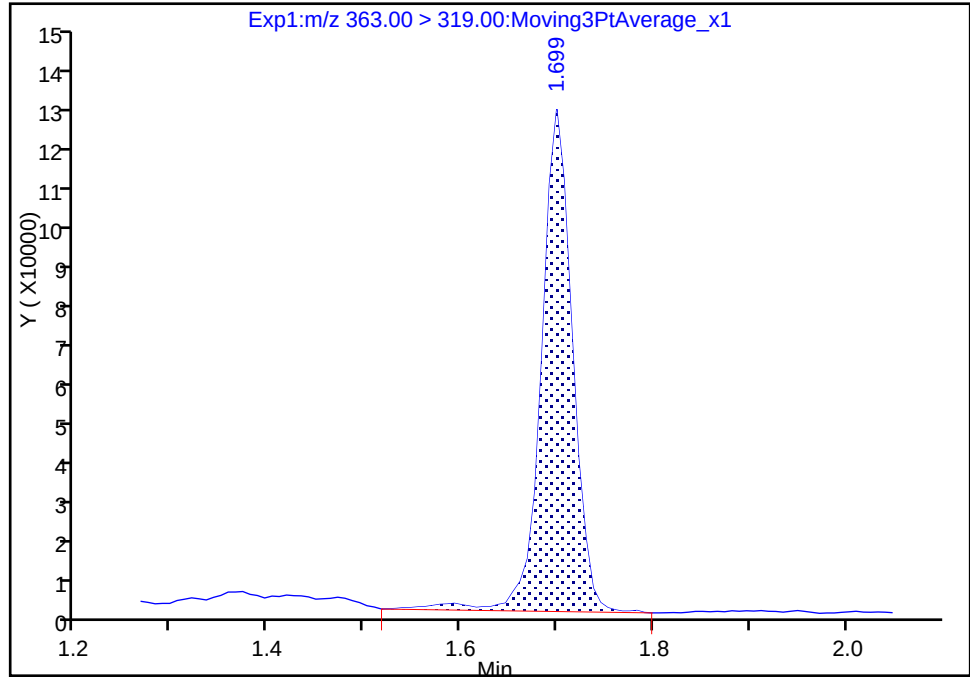
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_014.d  
Injection Date: 13-Nov-2017 03:24:00 Instrument ID: A8\_N  
Lims ID: 320-33018-A-5-A Lab Sample ID: 320-33018-5  
Client ID: NAWC-110217-RW-177-IRR  
Operator ID: SACINSTLCMS01 ALS Bottle#: 8 Worklist Smp#: 11  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

**4 Perfluoroheptanoic acid, CAS: 375-85-9**

Signal: 1

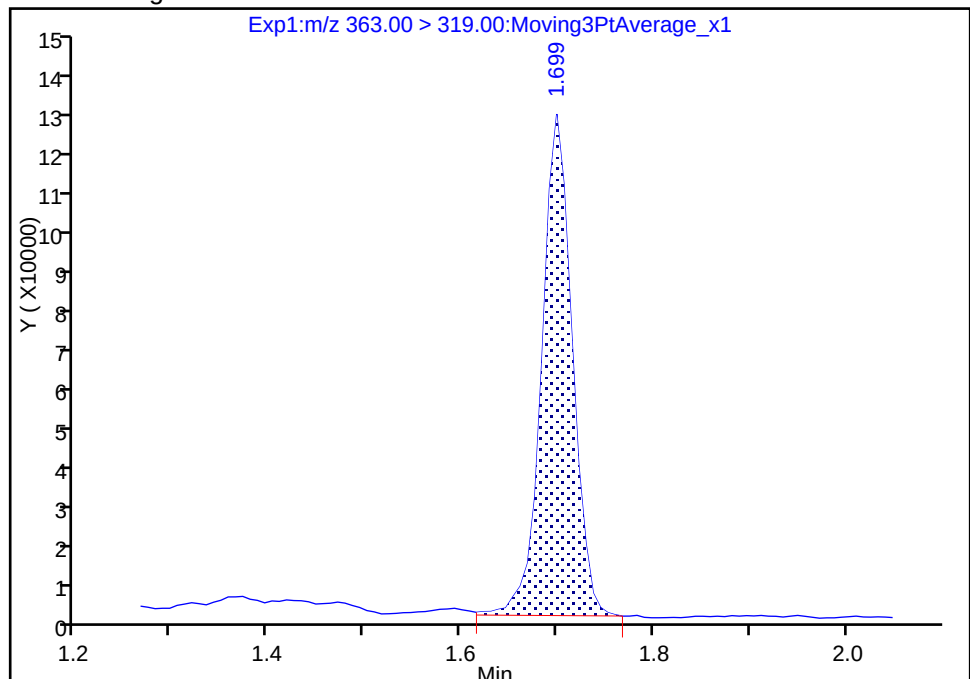
RT: 1.70  
Area: 276847  
Amount: 1.508207  
Amount Units: ng/ml

## Processing Integration Results



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

## Manual Integration Results



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

Audit Reason: Baseline  
Page 143 of 337

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                                  |                                              |
|--------------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>          | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                                   |                                              |
| Client Sample ID: <u>NAWC-110217-FRB-177-IRR</u> | Lab Sample ID: <u>320-33018-6</u>            |
| Matrix: <u>Water</u>                             | Lab File ID: <u>2017.11.13_537A_015.d</u>    |
| Analysis Method: <u>537</u>                      | Date Collected: <u>11/02/2017 09:05</u>      |
| Extraction Method: <u>537</u>                    | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>246.3 (mL)</u>                 | Date Analyzed: <u>11/13/2017 03:28</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>              | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>                  | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                                | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194241</u>                | Units: <u>ng/L</u>                           |

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

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_015.d  
 Lims ID: 320-33018-A-6-A  
 Client ID: NAWC-110217-FRB-177-IRR  
 Sample Type: Client  
 Inject. Date: 13-Nov-2017 03:28:39 ALS Bottle#: 9 Worklist Smp#: 12  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-33018-a-6-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

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

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_015.d

Injection Date: 13-Nov-2017 03:28:39

Instrument ID: A8\_N

Lims ID: 320-33018-A-6-A

Lab Sample ID: 320-33018-6

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

Operator ID: SACINSTLCMS01

ALS Bottle#: 9

Worklist Smp#: 12

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

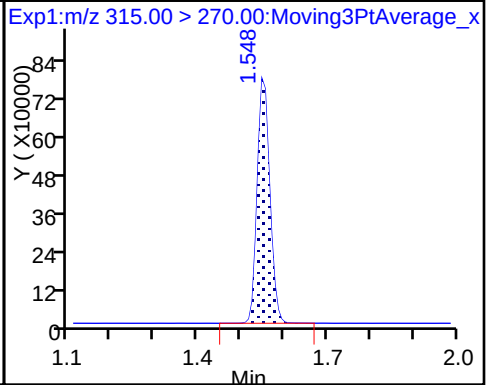
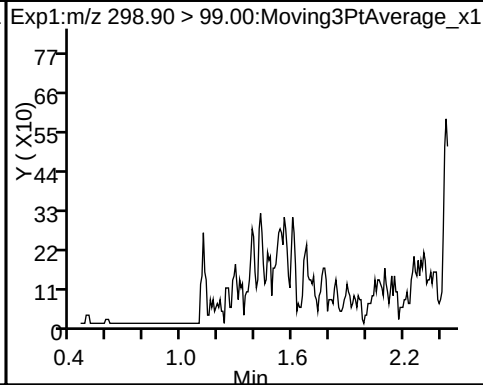
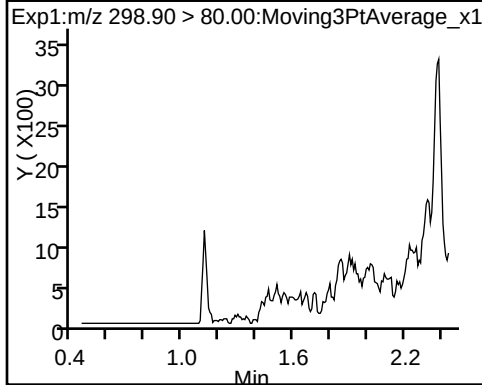
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

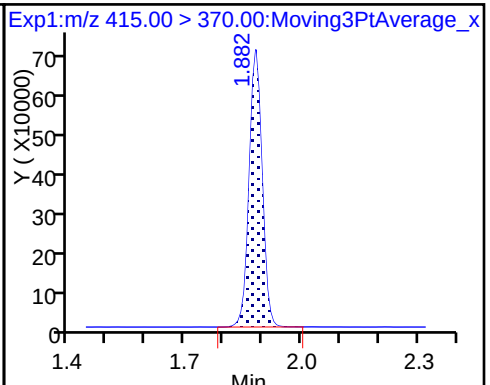
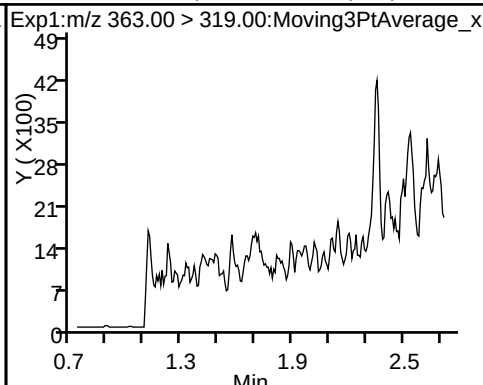
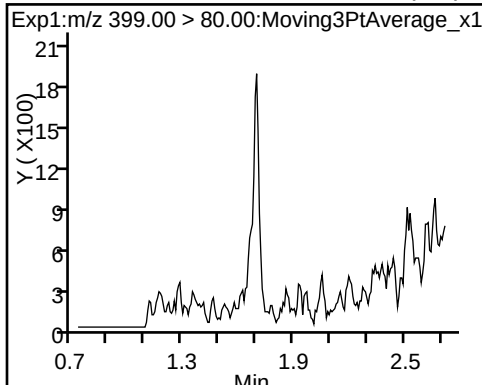
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

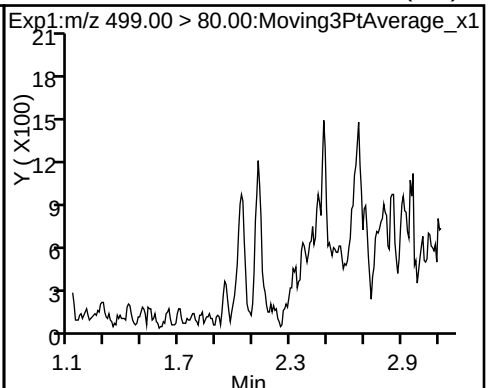
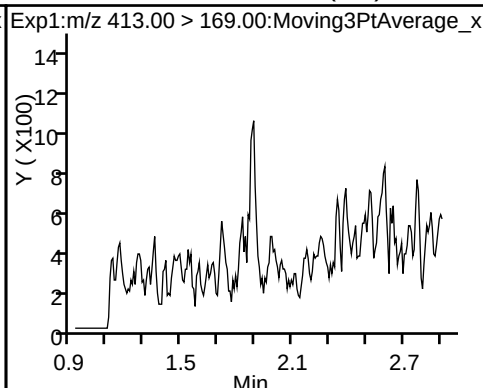
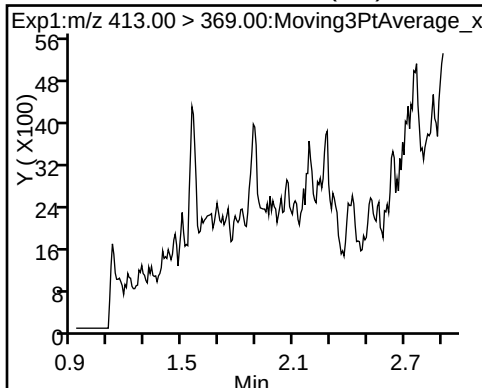
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

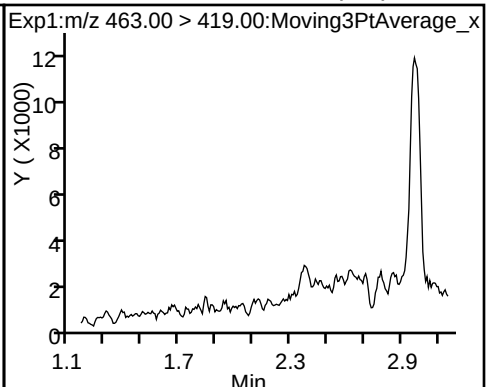
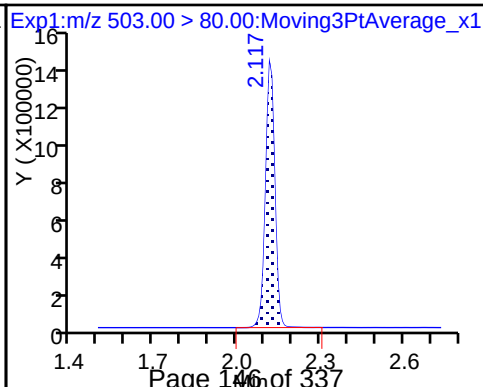
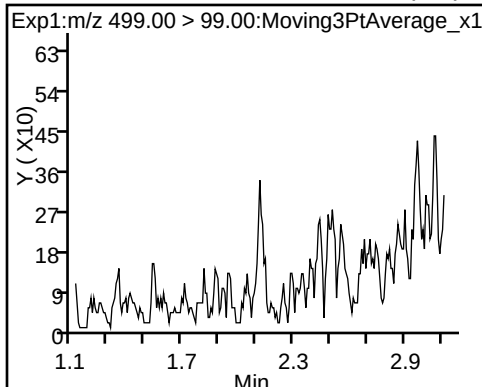
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

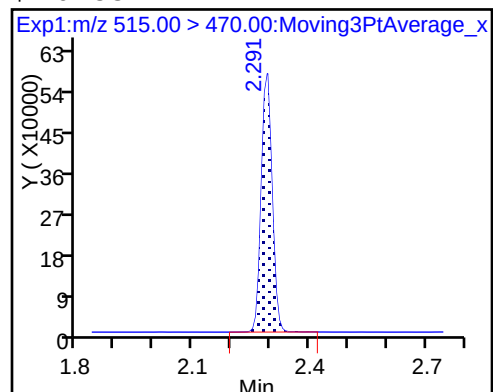


8 Perfluorooctane sulfonic acid (ND) \* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_015.d  
Lims ID: 320-33018-A-6-A  
Client ID: NAWC-110217-FRB-177-IRR  
Sample Type: Client  
Inject. Date: 13-Nov-2017 03:28:39 ALS Bottle#: 9 Worklist Smp#: 12  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-33018-a-6-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 :

Det: EXP1

Process Host: XAWRK010

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                                  |                                              |
|--------------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>          | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                                   |                                              |
| Client Sample ID: <u>NAWC-110217-RW-177-SHOP</u> | Lab Sample ID: <u>320-33018-7</u>            |
| Matrix: <u>Water</u>                             | Lab File ID: <u>2017.11.13_537A_016.d</u>    |
| Analysis Method: <u>537</u>                      | Date Collected: <u>11/02/2017 09:20</u>      |
| Extraction Method: <u>537</u>                    | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>243.8 (mL)</u>                 | Date Analyzed: <u>11/13/2017 03:33</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>              | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>                  | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                                | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194241</u>                | Units: <u>ng/L</u>                           |

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

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_016.d  
 Lims ID: 320-33018-A-7-A  
 Client ID: NAWC-110217-RW-177-SHOP  
 Sample Type: Client  
 Inject. Date: 13-Nov-2017 03:33:20 ALS Bottle#: 10 Worklist Smp#: 13  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-33018-a-7-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 17:01:42

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



## QC Flag Legend

### Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_016.d

Injection Date: 13-Nov-2017 03:33:20

Instrument ID: A8\_N

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

Lab Sample ID: 320-33018-7

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

Operator ID: SACINSTLCMS01

ALS Bottle#: 10

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

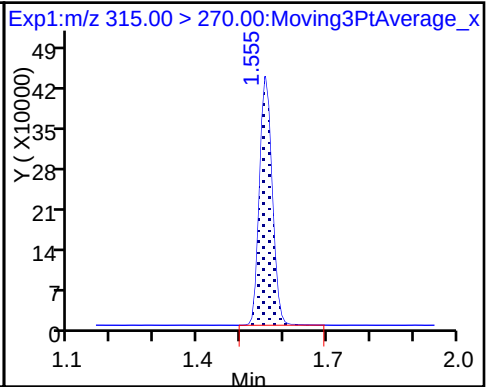
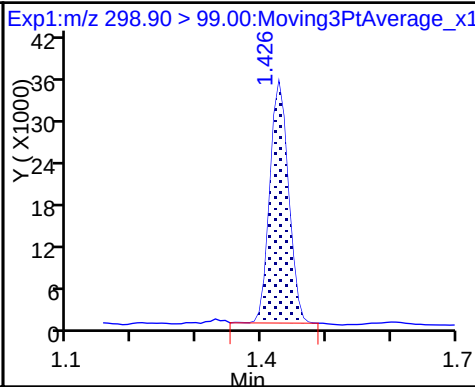
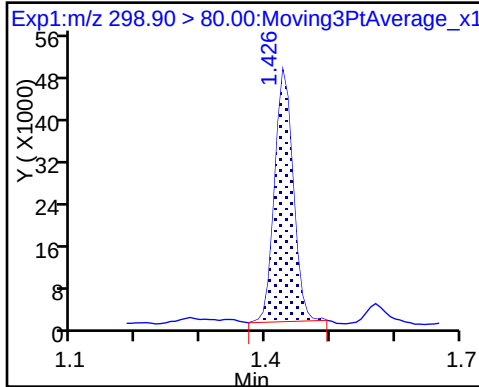
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

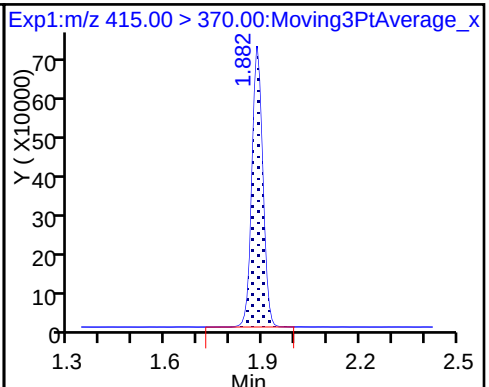
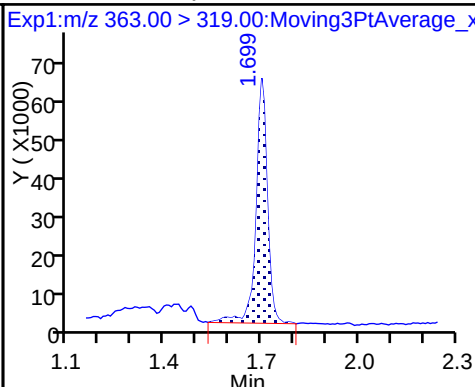
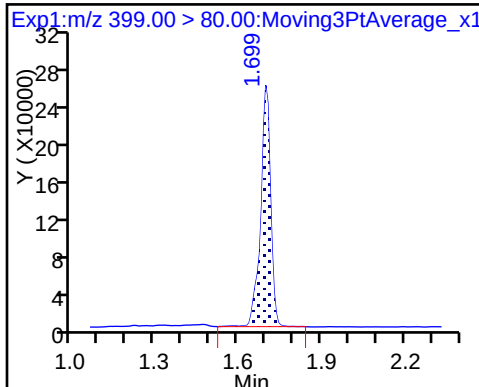
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

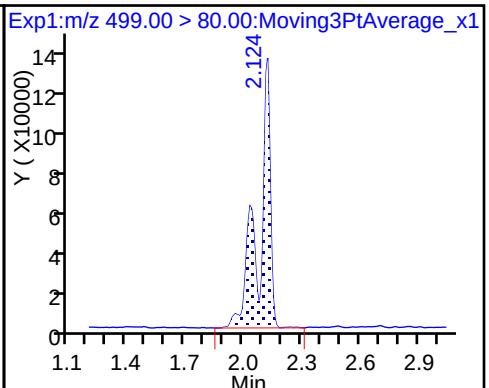
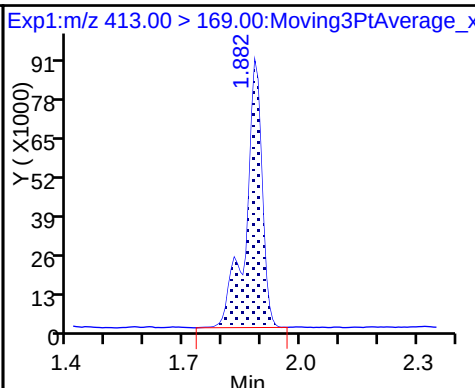
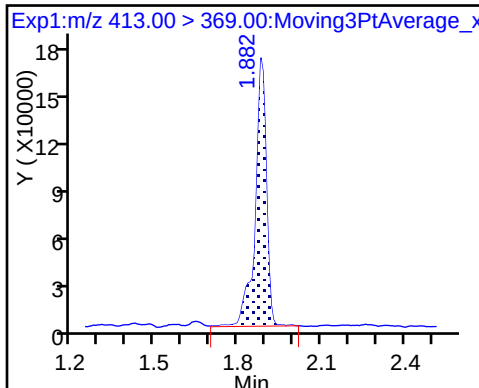
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

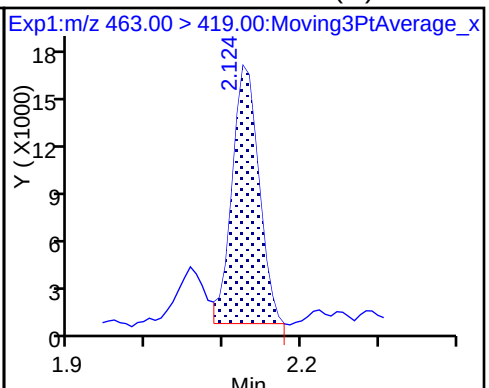
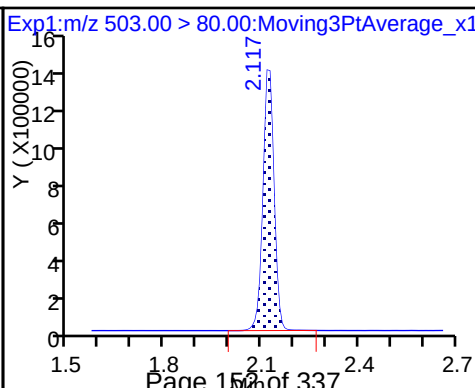
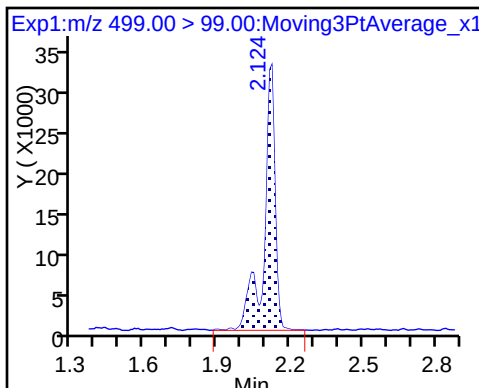
8 Perfluorooctane sulfonic acid



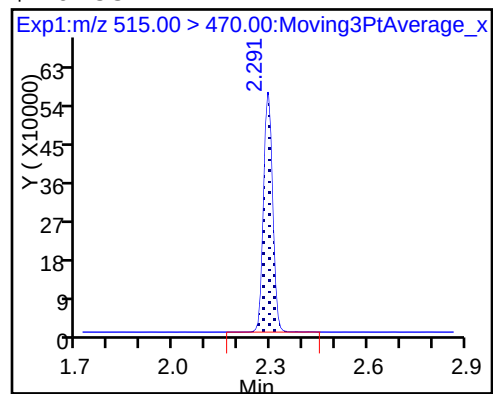
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_016.d  
Lims ID: 320-33018-A-7-A  
Client ID: NAWC-110217-RW-177-SHOP  
Sample Type: Client  
Inject. Date: 13-Nov-2017 03:33:20 ALS Bottle#: 10 Worklist Smp#: 13  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-33018-a-7-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
Column 1 : Det: EXP1  
Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 17:01:42

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

## TestAmerica Sacramento

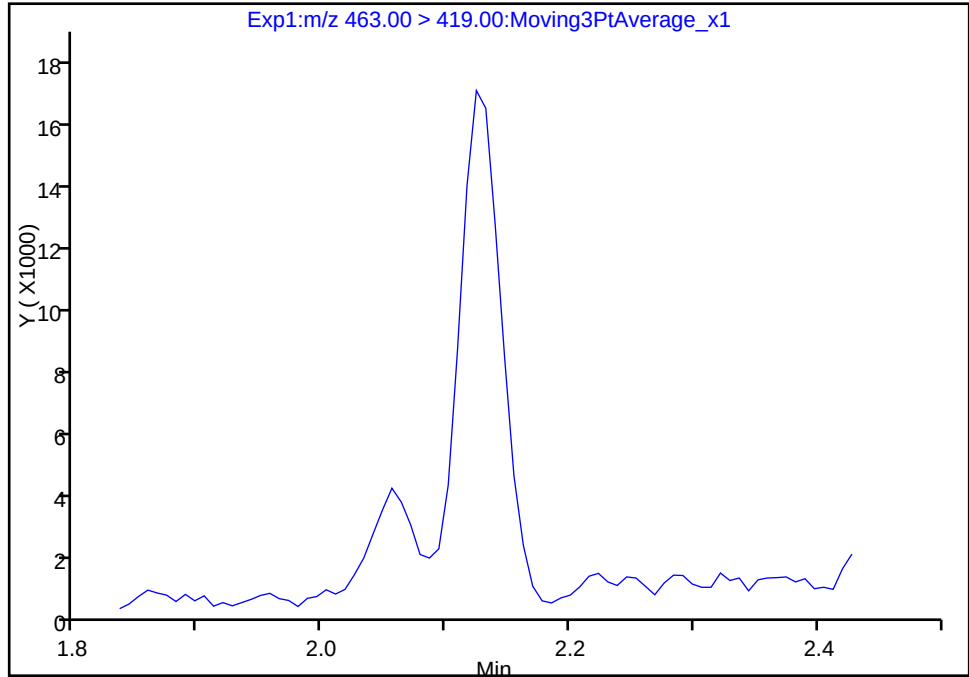
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_016.d  
Injection Date: 13-Nov-2017 03:33:20 Instrument ID: A8\_N  
Lims ID: 320-33018-A-7-A Lab Sample ID: 320-33018-7  
Client ID: NAWC-110217-RW-177-SHOP  
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 13  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

**9 Perfluorononanoic acid, CAS: 375-95-1**

Signal: 1

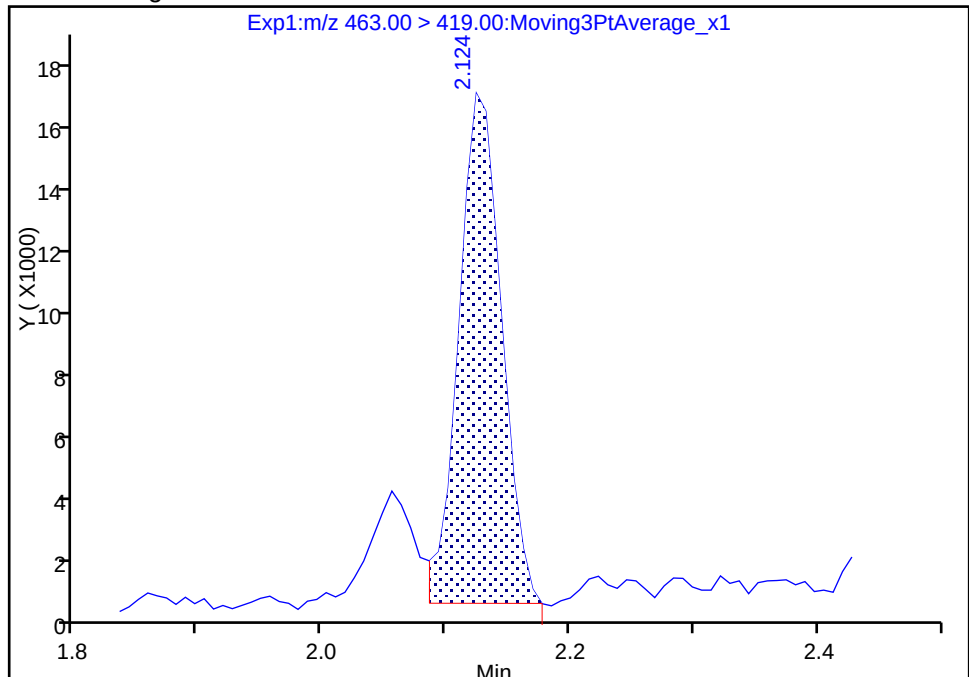
Not Detected  
Expected RT: 2.16

## Processing Integration Results



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

## Manual Integration Results



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

Audit Reason: Missed Peak

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-FRB-177-SHOP Lab Sample ID: 320-33018-8  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_019.d  
 Analysis Method: 537 Date Collected: 11/02/2017 09:15  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 251.1 (mL) Date Analyzed: 11/13/2017 03:47  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194251 Units: ng/L

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

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_019.d  
 Lims ID: 320-33018-A-8-A  
 Client ID: NAWC-110217-FRB-177-SHOP  
 Sample Type: Client  
 Inject. Date: 13-Nov-2017 03:47:22 ALS Bottle#: 11 Worklist Smp#: 16  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-33018-a-8-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

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

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_019.d

Injection Date: 13-Nov-2017 03:47:22

Instrument ID: A8\_N

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

Lab Sample ID: 320-33018-8

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

Operator ID: SACINSTLCMS01

ALS Bottle#: 11

Worklist Smp#: 16

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

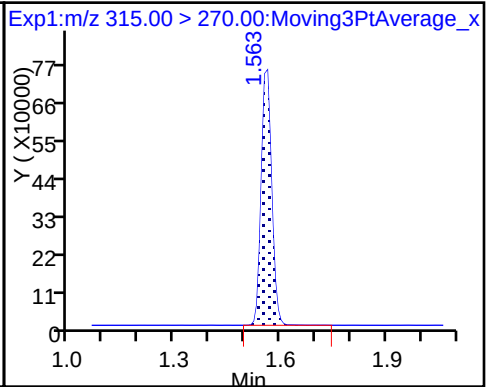
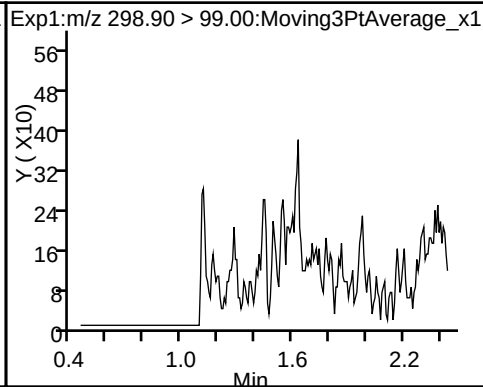
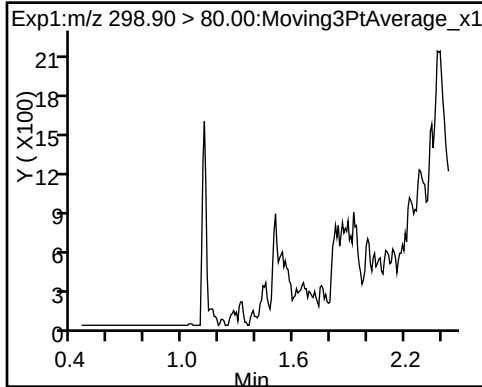
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

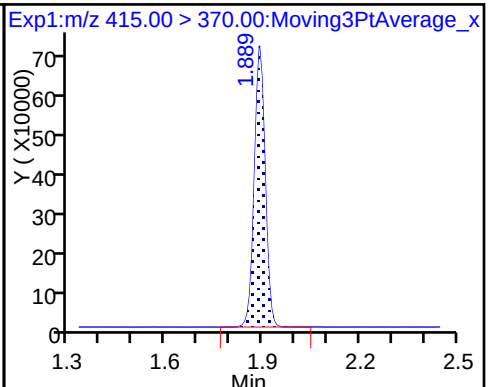
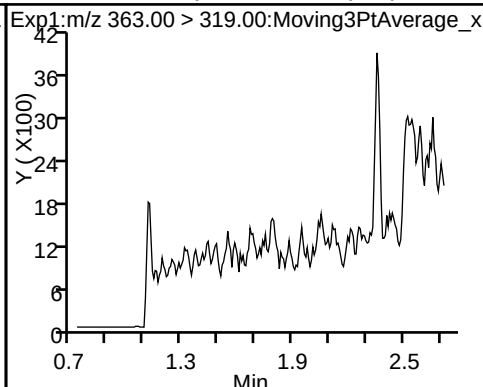
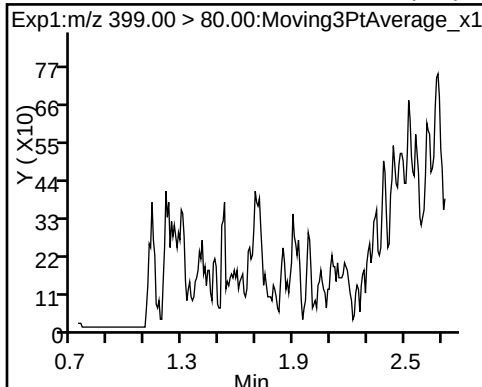
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

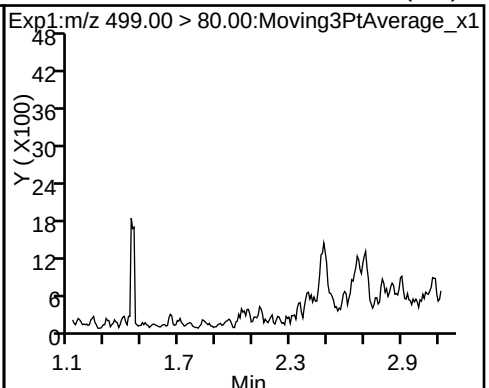
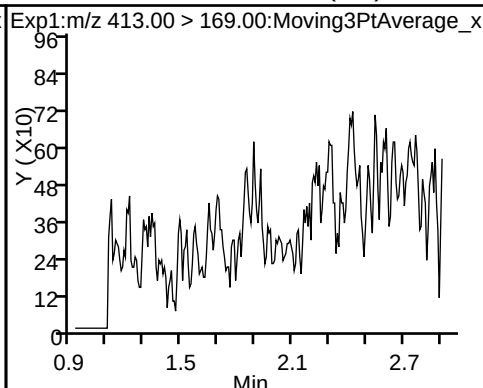
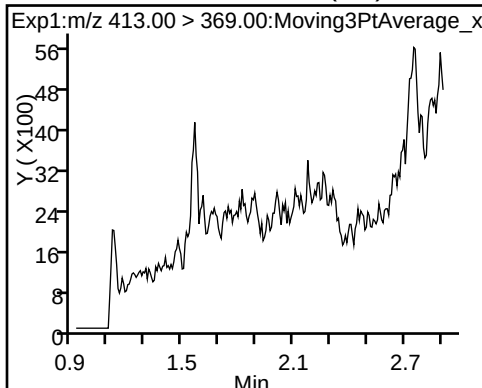
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

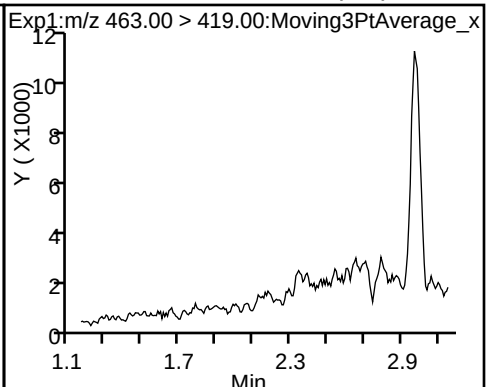
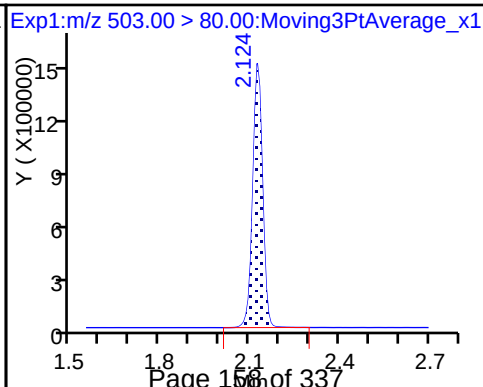
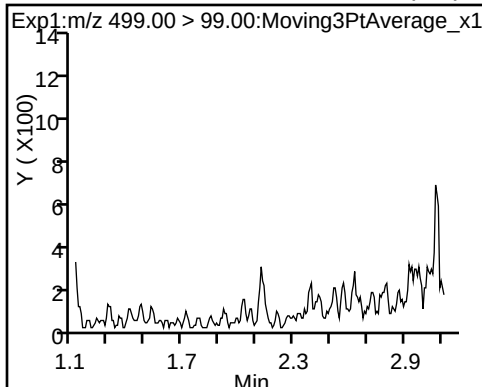
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



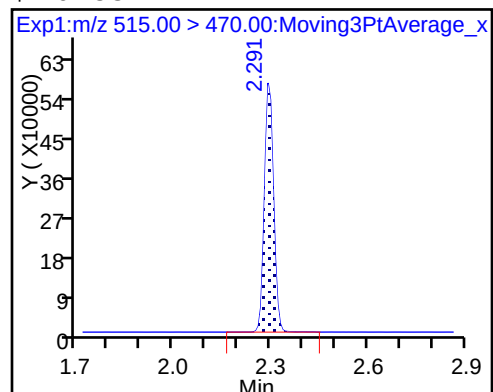
8 Perfluorooctane sulfonic acid (ND) \* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)





\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_019.d  
Lims ID: 320-33018-A-8-A  
Client ID: NAWC-110217-FRB-177-SHOP  
Sample Type: Client  
Inject. Date: 13-Nov-2017 03:47:22 ALS Bottle#: 11 Worklist Smp#: 16  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-33018-a-8-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-RW-185 Lab Sample ID: 320-33018-9  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_020.d  
 Analysis Method: 537 Date Collected: 11/02/2017 10:10  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 249.1 (mL) Date Analyzed: 11/13/2017 03:52  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194251 Units: ng/L

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

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_020.d  
 Lims ID: 320-33018-A-9-A  
 Client ID: NAWC-110217-RW-185  
 Sample Type: Client  
 Inject. Date: 13-Nov-2017 03:52:03 ALS Bottle#: 12 Worklist Smp#: 17  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-33018-a-9-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 17:02:56

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

## QC Flag Legend

### Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_020.d

Injection Date: 13-Nov-2017 03:52:03

Instrument ID: A8\_N

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

Lab Sample ID: 320-33018-9

Client ID: NAWC-110217-RW-185

Operator ID: SACINSTLCMS01

ALS Bottle#: 12

Worklist Smp#: 17

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

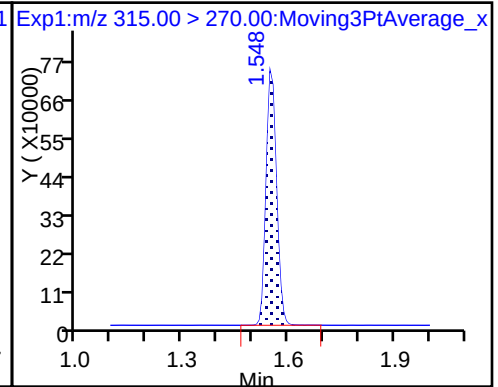
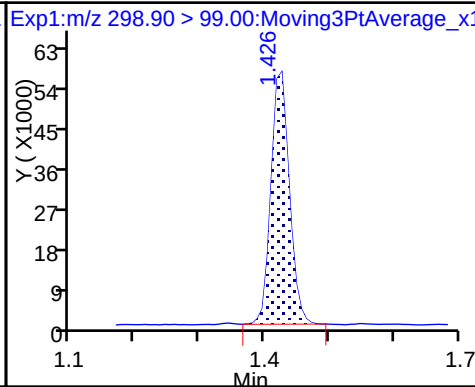
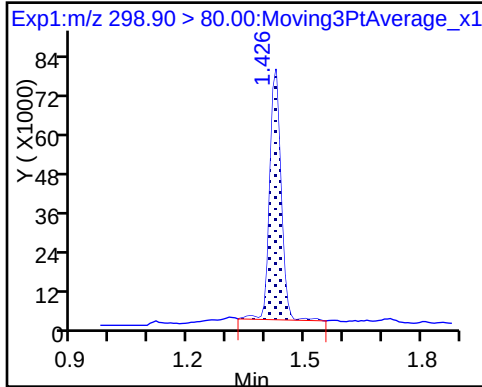
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

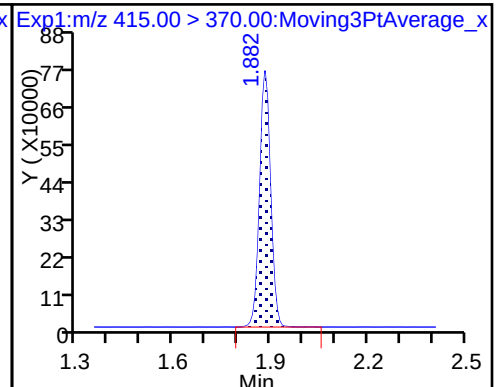
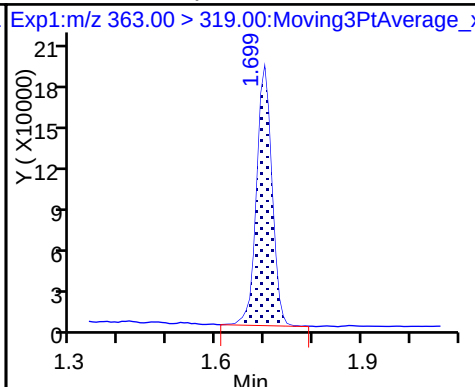
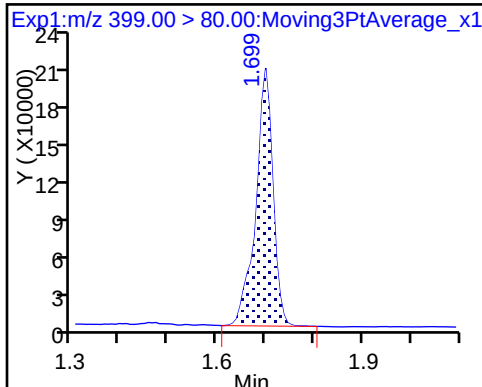
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

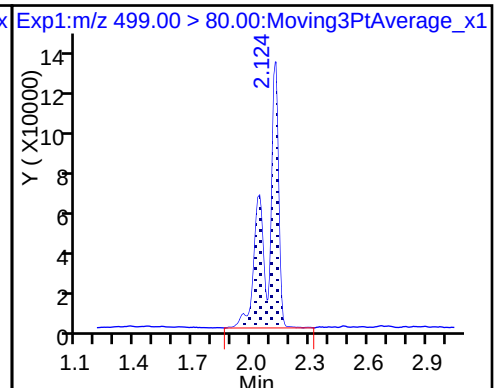
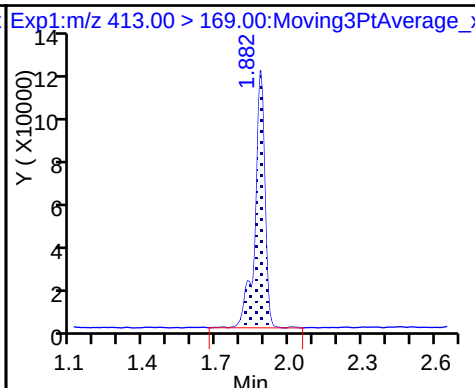
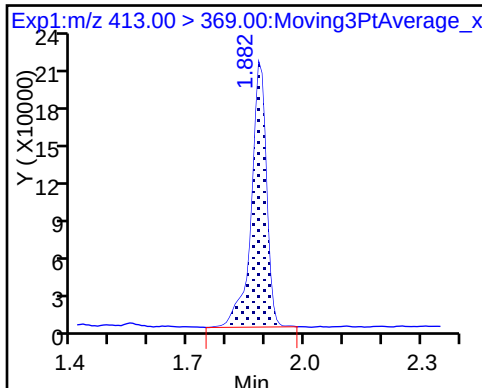
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

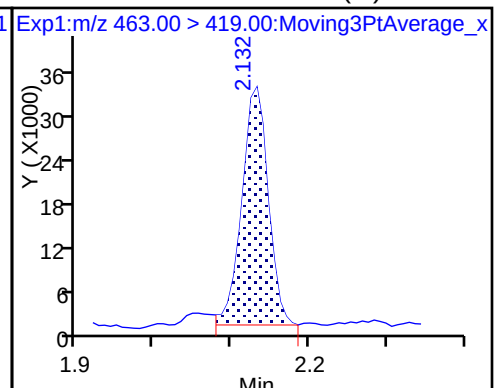
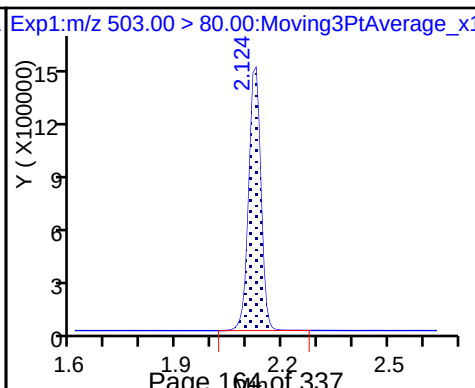
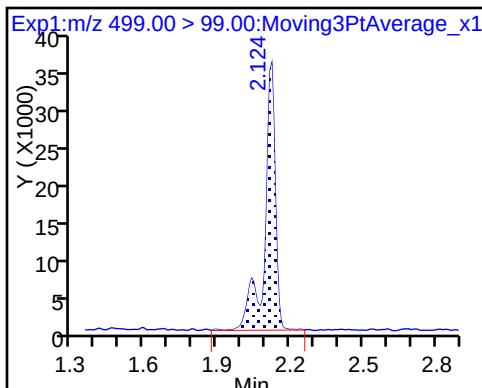
8 Perfluorooctane sulfonic acid



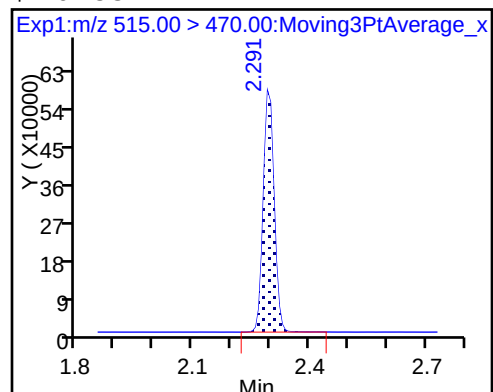
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_020.d  
Lims ID: 320-33018-A-9-A  
Client ID: NAWC-110217-RW-185  
Sample Type: Client  
Inject. Date: 13-Nov-2017 03:52:03 ALS Bottle#: 12 Worklist Smp#: 17  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-33018-a-9-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
Column 1 : Det: EXP1  
Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 17:02:56

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



## TestAmerica Sacramento

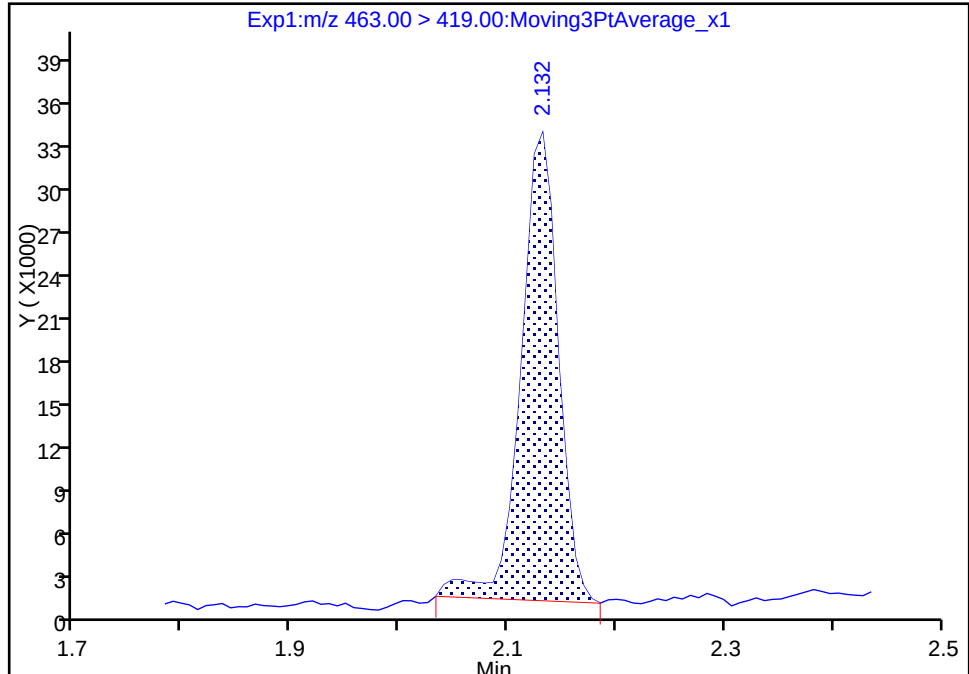
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|-----------------|----------------------------------------------------------------------------|----------------|-------------|----------------|----|
| Data File:      | \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_020.d | 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

**9 Perfluorononanoic acid, CAS: 375-95-1**

Signal: 1

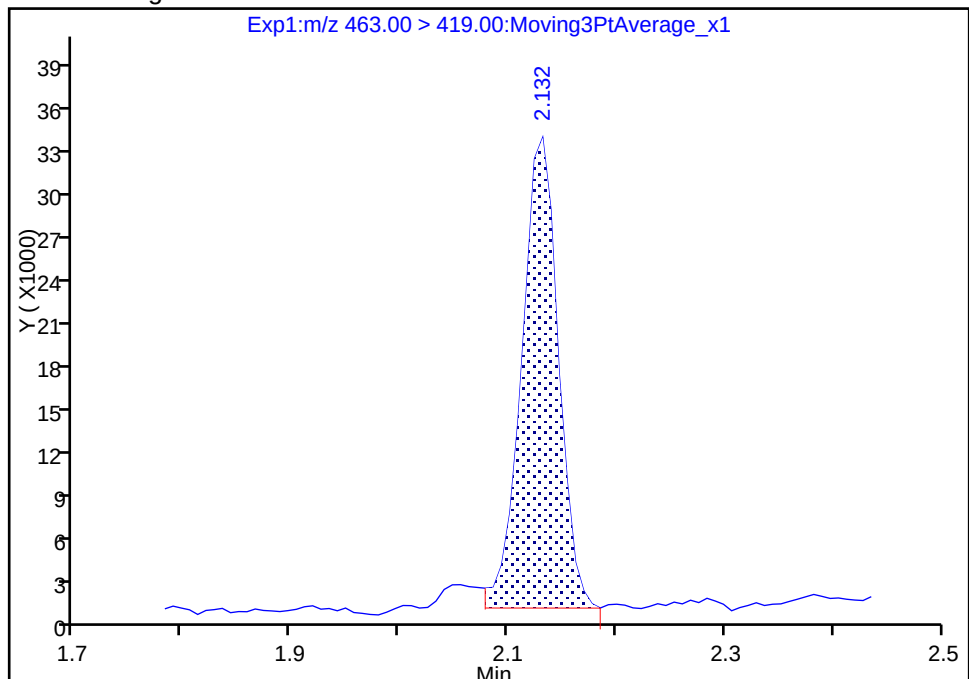
RT: 2.13  
Area: 78153  
Amount: 0.672362  
Amount Units: ng/ml

## Processing Integration Results



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

## Manual Integration Results



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

Audit Reason: Split Peak  
Page 167 of 337

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                             |
|----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-33018-1</u>                 |
| SDG No.: _____                               |                                             |
| Client Sample ID: <u>NAWC-110217-FRB-185</u> | Lab Sample ID: <u>320-33018-10</u>          |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2017.11.13_537A_021.d</u>   |
| Analysis Method: <u>537</u>                  | Date Collected: <u>11/02/2017 10:05</u>     |
| Extraction Method: <u>537</u>                | Date Extracted: <u>11/08/2017 11:47</u>     |
| Sample wt/vol: <u>250.6(mL)</u>              | Date Analyzed: <u>11/13/2017 03:56</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>           | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>194251</u>            | Units: <u>ng/L</u>                          |

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

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_021.d  
 Lims ID: 320-33018-A-10-A  
 Client ID: NAWC-110217-FRB-185  
 Sample Type: Client  
 Inject. Date: 13-Nov-2017 03:56:44 ALS Bottle#: 13 Worklist Smp#: 18  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-33018-a-10-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

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

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_021.d

Injection Date: 13-Nov-2017 03:56:44

Instrument ID: A8\_N

Lims ID: 320-33018-A-10-A

Lab Sample ID: 320-33018-10

Client ID: NAWC-110217-FRB-185

Operator ID: SACINSTLCMS01

ALS Bottle#: 13

Worklist Smp#: 18

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

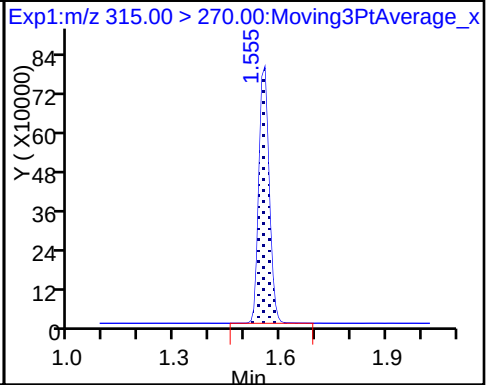
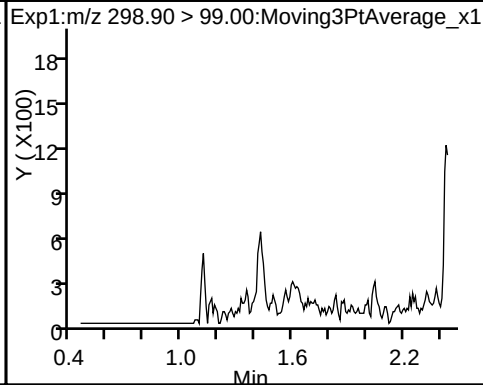
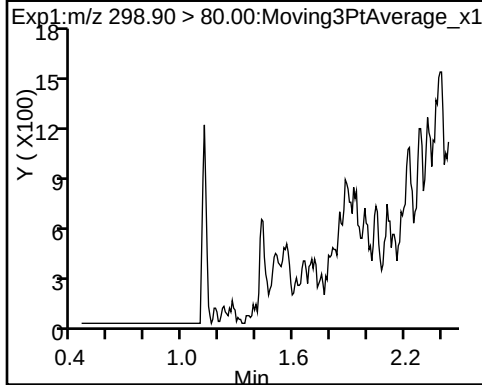
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

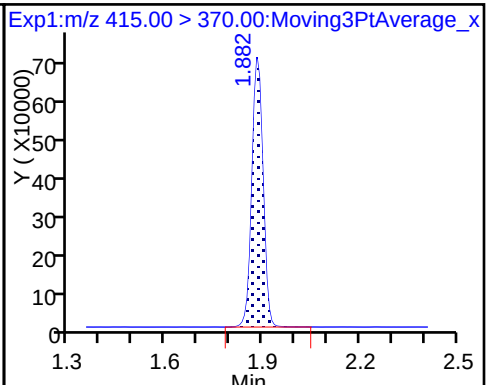
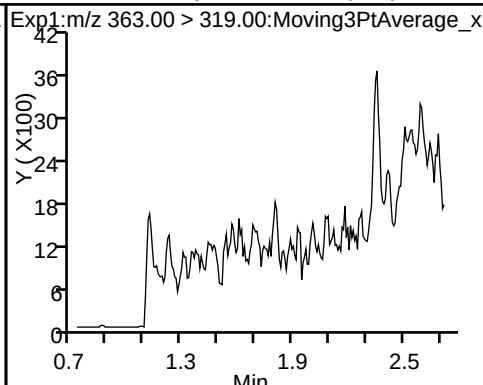
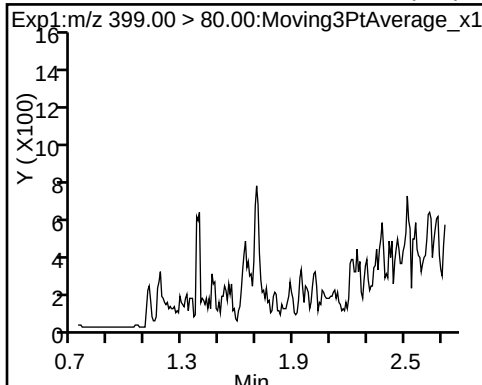
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

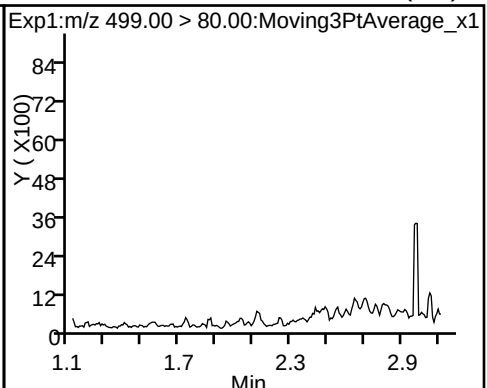
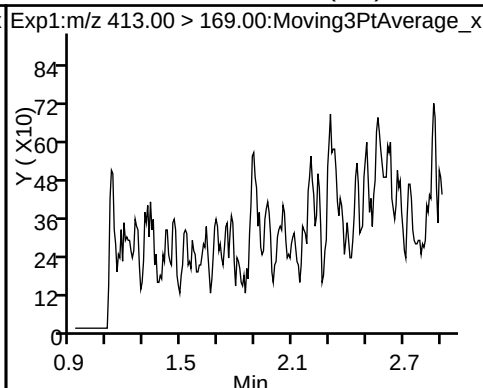
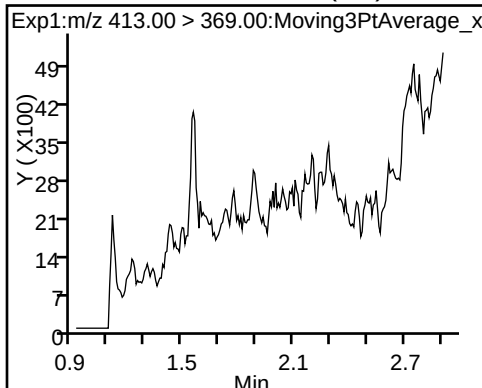
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

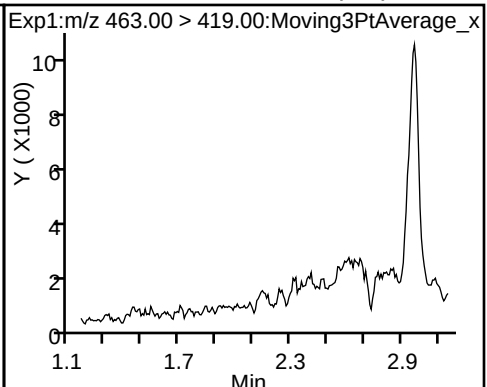
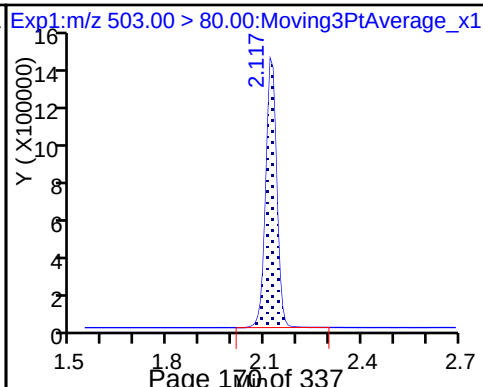
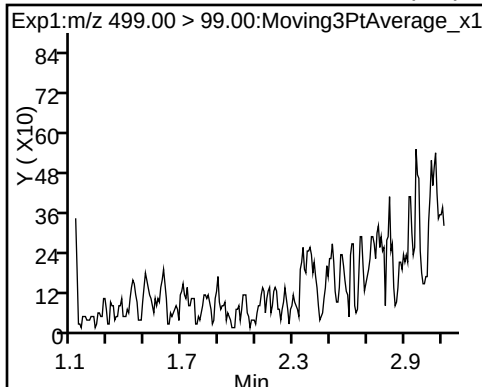
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

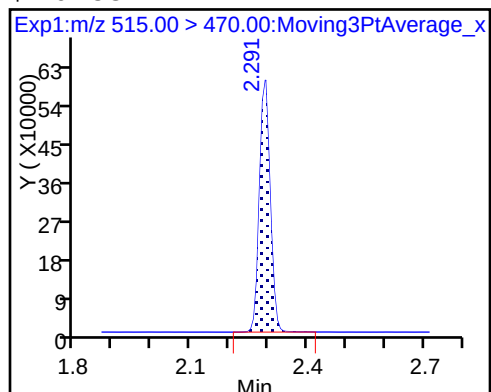


8 Perfluorooctane sulfonic acid (ND) \* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_021.d  
Lims ID: 320-33018-A-10-A  
Client ID: NAWC-110217-FRB-185  
Sample Type: Client  
Inject. Date: 13-Nov-2017 03:56:44 ALS Bottle#: 13 Worklist Smp#: 18  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-33018-a-10-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                             |                                              |
|---------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>     | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                              |                                              |
| Client Sample ID: <u>NAWC-110217-RW-355</u> | Lab Sample ID: <u>320-33018-11</u>           |
| Matrix: <u>Water</u>                        | Lab File ID: <u>2017.11.13_537A_022.d</u>    |
| Analysis Method: <u>537</u>                 | Date Collected: <u>11/02/2017 10:40</u>      |
| Extraction Method: <u>537</u>               | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>249.3 (mL)</u>            | Date Analyzed: <u>11/13/2017 04:01</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>         | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>             | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                           | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194251</u>           | Units: <u>ng/L</u>                           |

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

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_022.d  
 Lims ID: 320-33018-A-11-A  
 Client ID: NAWC-110217-RW-355  
 Sample Type: Client  
 Inject. Date: 13-Nov-2017 04:01:26 ALS Bottle#: 14 Worklist Smp#: 19  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-33018-a-11-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 17:03:52

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



## QC Flag Legend

### Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_022.d

Injection Date: 13-Nov-2017 04:01:26

Instrument ID: A8\_N

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

Lab Sample ID: 320-33018-11

Client ID: NAWC-110217-RW-355

Operator ID: SACINSTLCMS01

ALS Bottle#: 14

Worklist Smp#: 19

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

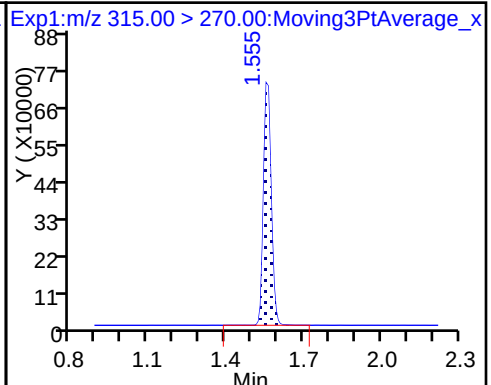
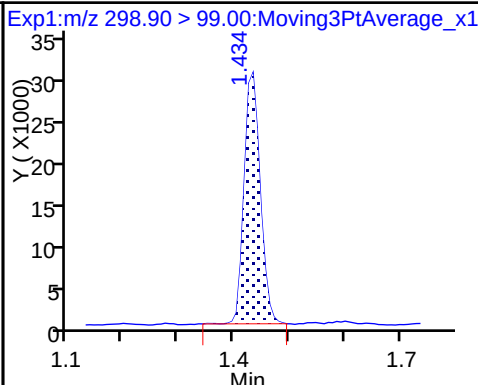
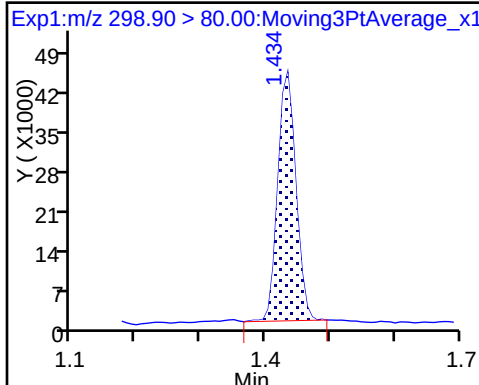
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

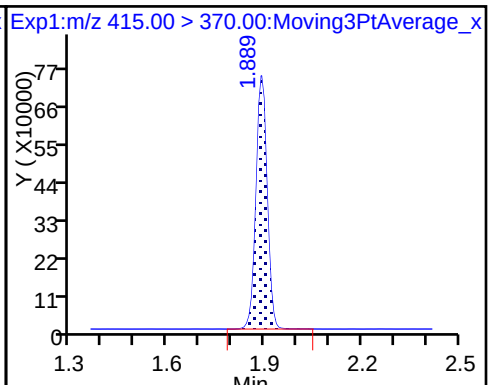
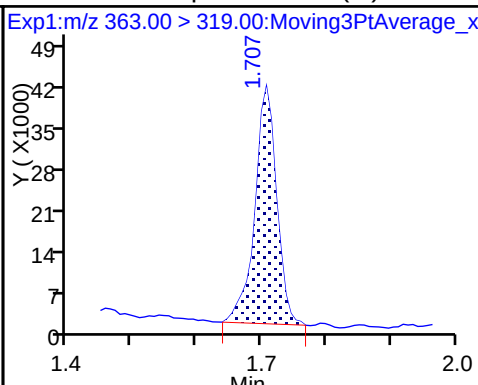
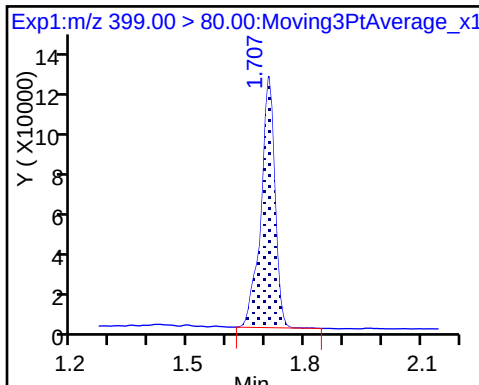
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid (M)

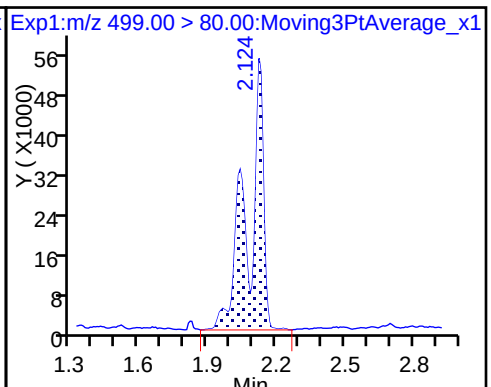
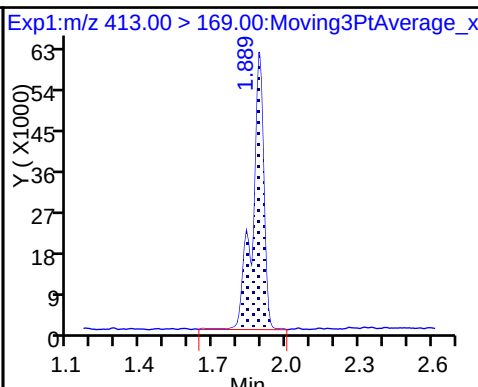
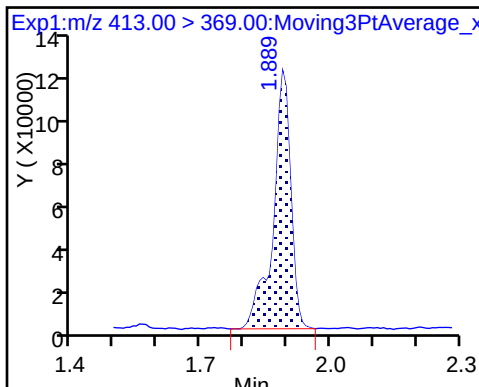
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

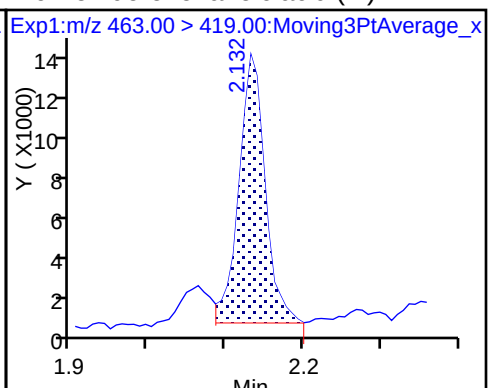
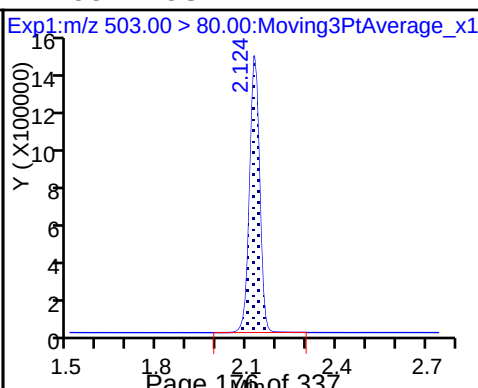
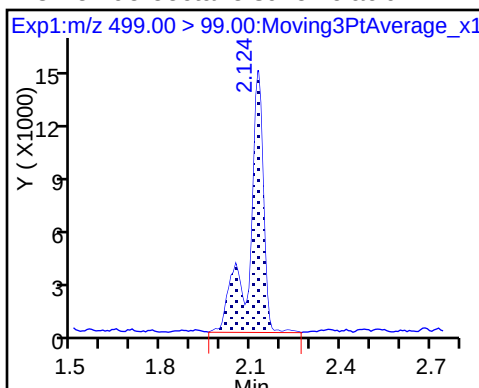
8 Perfluorooctane sulfonic acid



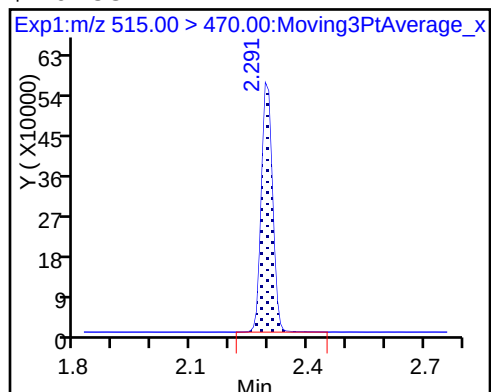
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_022.d  
Lims ID: 320-33018-A-11-A  
Client ID: NAWC-110217-RW-355  
Sample Type: Client  
Inject. Date: 13-Nov-2017 04:01:26 ALS Bottle#: 14 Worklist Smp#: 19  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-33018-a-11-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
Column 1 : Det: EXP1  
Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 17:03:52

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

## TestAmerica Sacramento

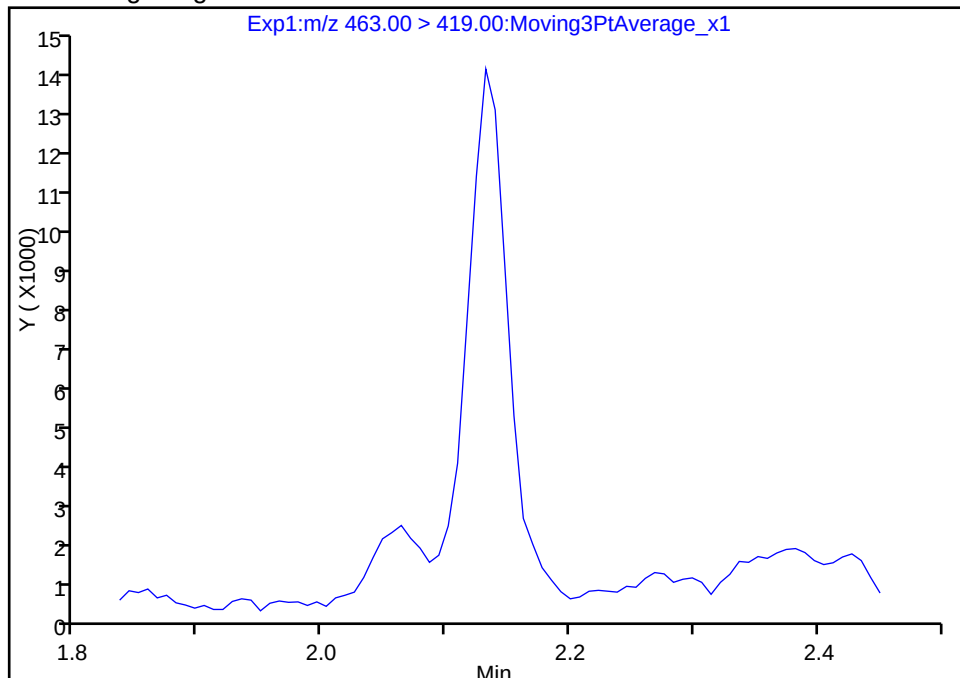
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_022.d  
Injection Date: 13-Nov-2017 04:01:26 Instrument ID: A8\_N  
Lims ID: 320-33018-A-11-A Lab Sample ID: 320-33018-11  
Client ID: NAWC-110217-RW-355  
Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 19  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

**9 Perfluorononanoic acid, CAS: 375-95-1**

Signal: 1

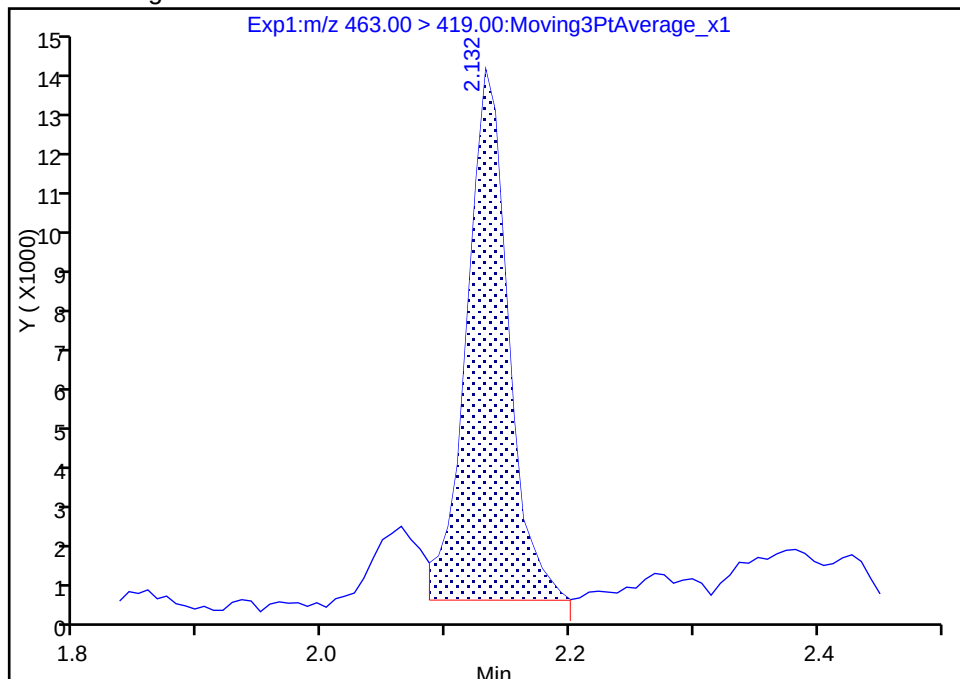
Not Detected  
Expected RT: 2.16

## Processing Integration Results



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

## Manual Integration Results



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

Audit Reason: Missed Peak

## TestAmerica Sacramento

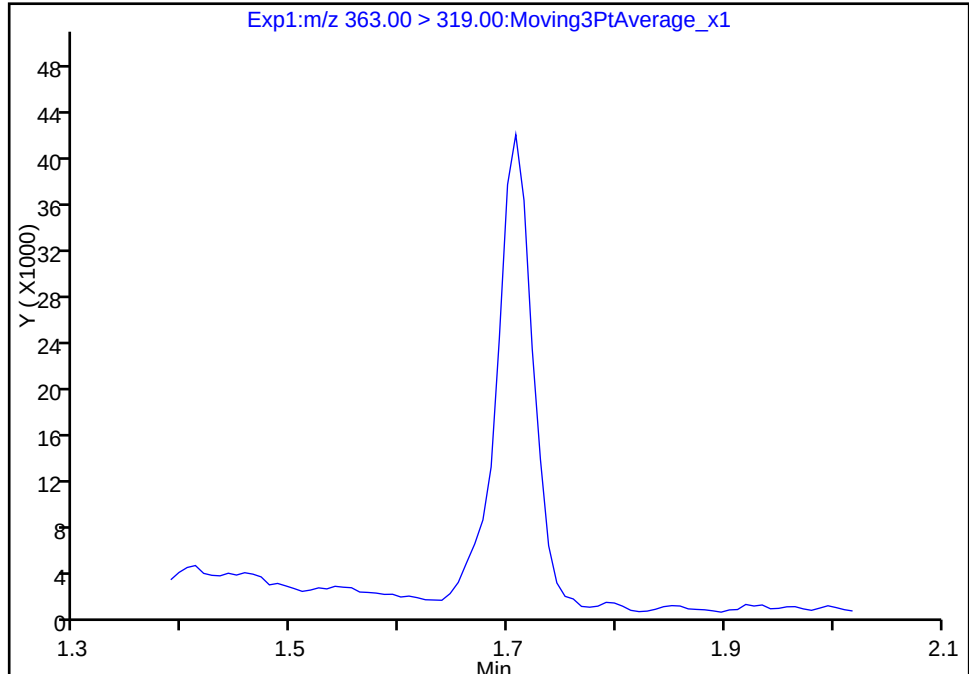
|                 |                                                                            |                |              |                |    |
|-----------------|----------------------------------------------------------------------------|----------------|--------------|----------------|----|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

**4 Perfluoroheptanoic acid, CAS: 375-85-9**

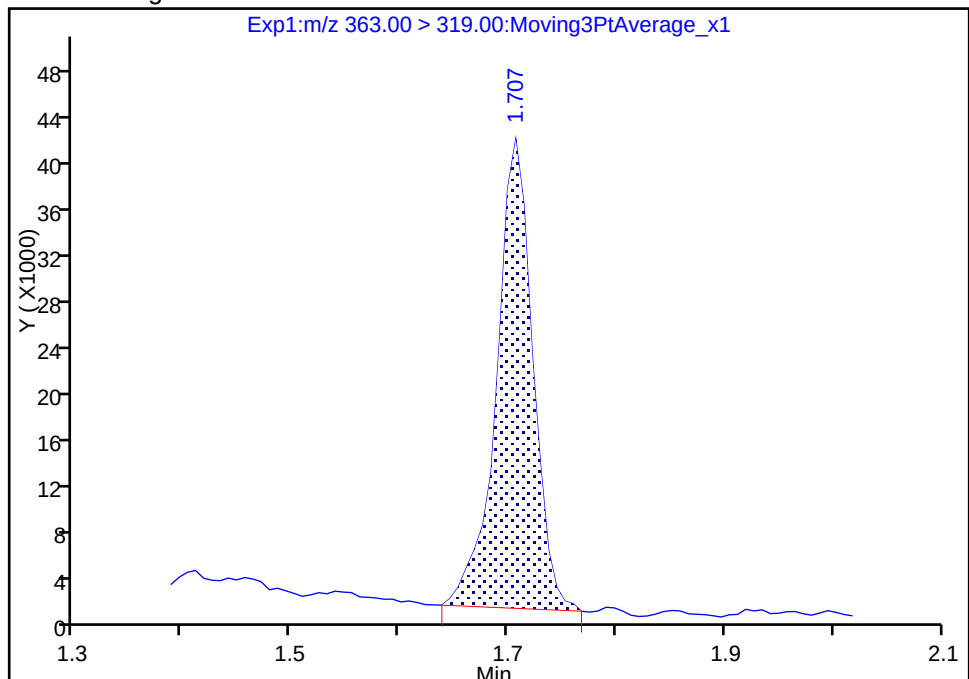
Signal: 1

Not Detected  
Expected RT: 1.72

## Processing Integration Results

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

## Manual Integration Results

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

Audit Reason: Missed Peak

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                              |
|----------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                               |                                              |
| Client Sample ID: <u>NAWC-110217-FRB-355</u> | Lab Sample ID: <u>320-33018-12</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2017.11.13_537A_023.d</u>    |
| Analysis Method: <u>537</u>                  | Date Collected: <u>11/02/2017 10:35</u>      |
| Extraction Method: <u>537</u>                | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>245.2 (mL)</u>             | Date Analyzed: <u>11/13/2017 04:06</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>          | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>              | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194251</u>            | Units: <u>ng/L</u>                           |

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

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_023.d  
 Lims ID: 320-33018-A-12-A  
 Client ID: NAWC-110217-FRB-355  
 Sample Type: Client  
 Inject. Date: 13-Nov-2017 04:06:08 ALS Bottle#: 15 Worklist Smp#: 20  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-33018-a-12-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

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



## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_023.d

Injection Date: 13-Nov-2017 04:06:08

Instrument ID: A8\_N

Lims ID: 320-33018-A-12-A

Lab Sample ID: 320-33018-12

Client ID: NAWC-110217-FRB-355

Operator ID: SACINSTLCMS01

ALS Bottle#: 15

Worklist Smp#: 20

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

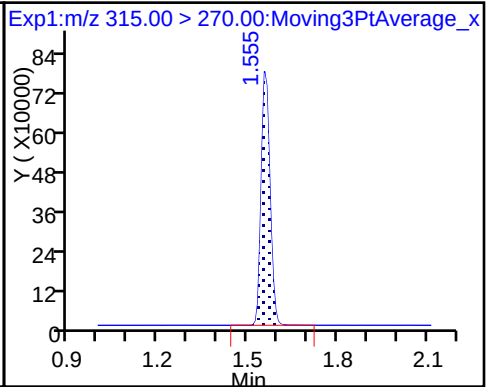
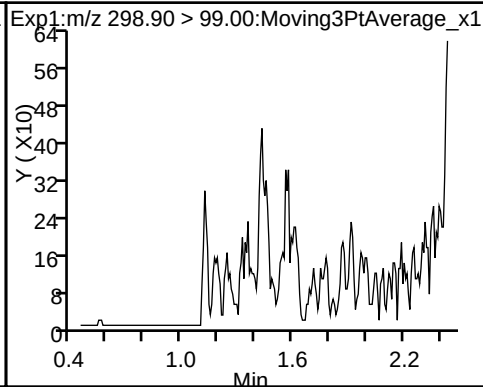
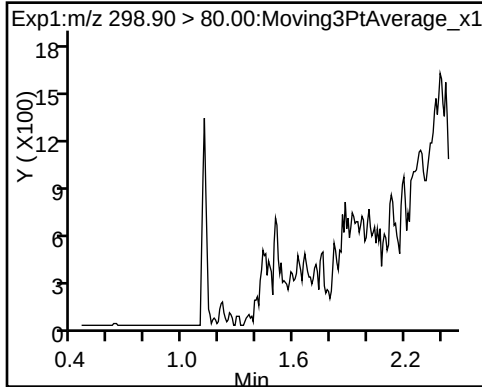
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

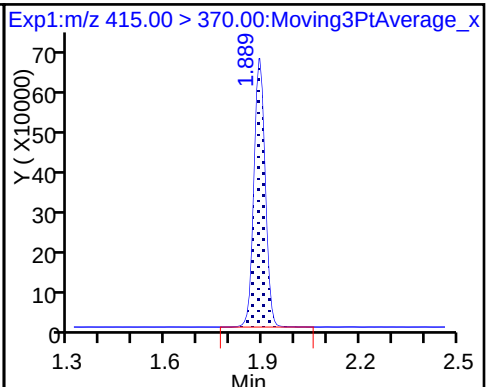
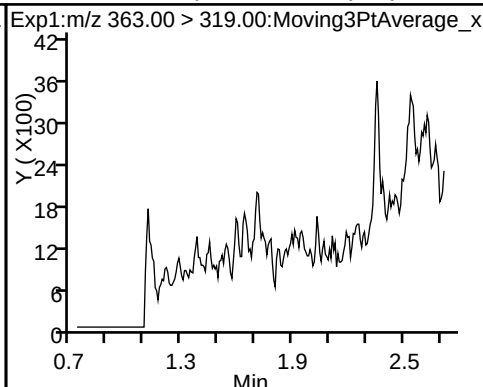
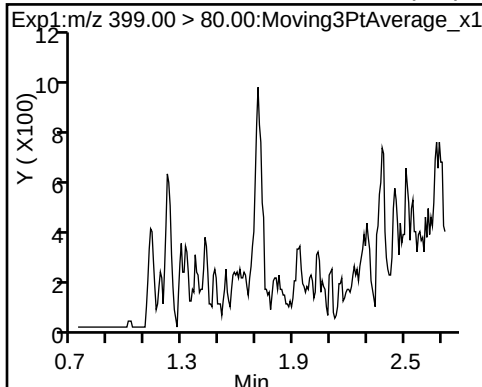
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

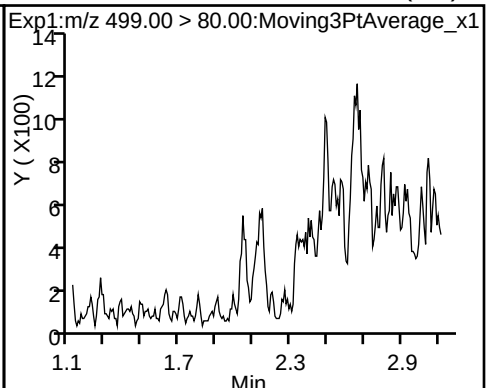
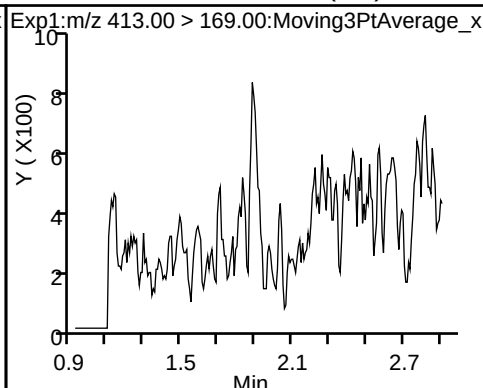
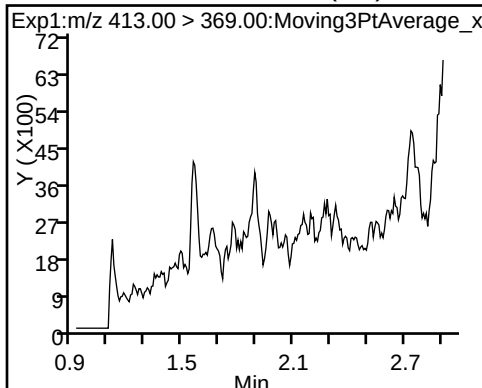
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

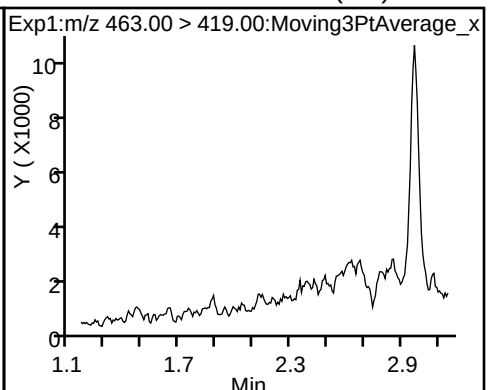
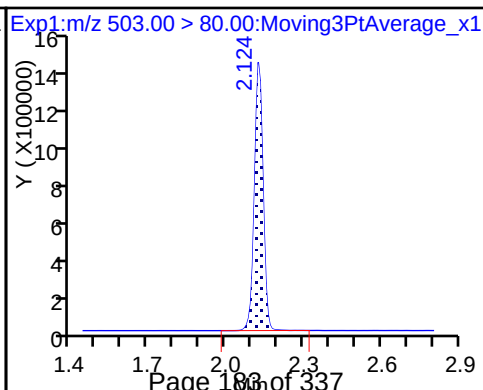
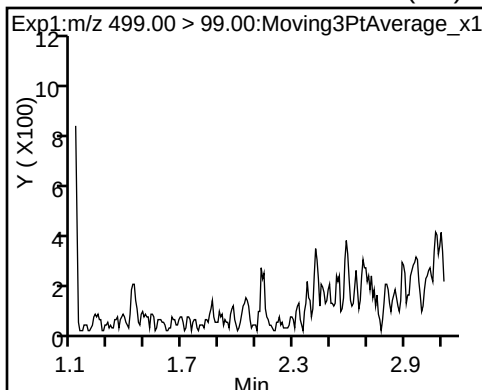
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

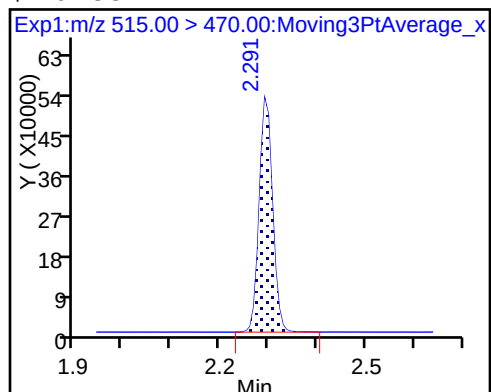


8 Perfluorooctane sulfonic acid (ND) \* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_023.d  
Lims ID: 320-33018-A-12-A  
Client ID: NAWC-110217-FRB-355  
Sample Type: Client  
Inject. Date: 13-Nov-2017 04:06:08 ALS Bottle#: 15 Worklist Smp#: 20  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-33018-a-12-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                             |                                             |
|---------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>     | Job No.: <u>320-33018-1</u>                 |
| SDG No.: _____                              |                                             |
| Client Sample ID: <u>NAWC-110217-RW-348</u> | Lab Sample ID: <u>320-33018-13</u>          |
| Matrix: <u>Water</u>                        | Lab File ID: <u>2017.11.13_537A_024.d</u>   |
| Analysis Method: <u>537</u>                 | Date Collected: <u>11/02/2017 11:40</u>     |
| Extraction Method: <u>537</u>               | Date Extracted: <u>11/08/2017 11:47</u>     |
| Sample wt/vol: <u>250.3(mL)</u>             | Date Analyzed: <u>11/13/2017 04:10</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>          | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>              | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                           | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>194251</u>           | Units: <u>ng/L</u>                          |

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

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_024.d  
 Lims ID: 320-33018-A-13-A  
 Client ID: NAWC-110217-RW-348  
 Sample Type: Client  
 Inject. Date: 13-Nov-2017 04:10:48 ALS Bottle#: 16 Worklist Smp#: 21  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-33018-a-13-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 17:04:36

| Signal                          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | S/N  | Flags |
|---------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid  |       |           |           |           |          |                 |                 |      |       |
| 298.90 > 80.00                  | 1.426 | 1.444     | -0.018    | 1.000     | 227231   | 1.78            |                 | 80.2 |       |
| 298.90 > 99.00                  | 1.426 | 1.444     | -0.018    | 1.000     | 152842   |                 | 1.49(0.00-0.00) | 346  |       |
| \$ 2 13C2 PFHxA                 |       |           |           |           |          |                 |                 |      |       |
| 315.00 > 270.00                 | 1.555 | 1.573     | -0.018    | 1.000     | 1590765  | 8.16            |                 | 6839 |       |
| 3 Perfluorohexanesulfonic acid  |       |           |           |           |          |                 |                 |      |       |
| 399.00 > 80.00                  | 1.699 | 1.725     | -0.026    | 1.000     | 483969   | 2.53            |                 | 207  |       |
| 4 Perfluoroheptanoic acid       |       |           |           |           |          |                 |                 |      |       |
| 363.00 > 319.00                 | 1.699 | 1.725     | -0.026    | 1.000     | 194040   | 1.17            |                 | 41.5 |       |
| * 6 13C2-PFOA                   |       |           |           |           |          |                 |                 |      |       |
| 415.00 > 370.00                 | 1.882 | 1.913     | -0.031    |           | 1771725  | 10.0            |                 | 7200 |       |
| 5 Perfluorooctanoic acid        |       |           |           |           |          |                 |                 |      |       |
| 413.00 > 369.00                 | 1.882 | 1.914     | -0.032    | 1.000     | 769129   | 4.69            |                 | 119  |       |
| 413.00 > 169.00                 | 1.882 | 1.914     | -0.032    | 1.000     | 432469   |                 | 1.78(0.00-0.00) | 406  |       |
| 8 Perfluorooctane sulfonic acid |       |           |           |           |          |                 |                 |      |       |
| 499.00 > 80.00                  | 2.117 | 2.117     | 0.0       | 1.000     | 883147   | 8.22            |                 | 329  |       |
| 499.00 > 99.00                  | 2.117 | 2.117     | 0.0       | 1.000     | 184838   |                 | 4.78(0.00-0.00) | 352  |       |
| * 7 13C4 PFOS                   |       |           |           |           |          |                 |                 |      |       |
| 503.00 > 80.00                  | 2.117 | 2.151     | -0.034    |           | 3280139  | 28.7            |                 | 2448 |       |
| 9 Perfluorononanoic acid        |       |           |           |           |          |                 |                 |      |       |
| 463.00 > 419.00                 | 2.124 | 2.158     | -0.034    | 1.000     | 69436    | 0.5901          |                 | 16.1 | M     |
| \$ 10 13C2 PFDA                 |       |           |           |           |          |                 |                 |      |       |
| 515.00 > 470.00                 | 2.291 | 2.312     | -0.021    | 1.000     | 1123974  | 8.29            |                 | 8865 | M     |

## QC Flag Legend

### Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_024.d

Injection Date: 13-Nov-2017 04:10:48

Instrument ID: A8\_N

Lims ID: 320-33018-A-13-A

Lab Sample ID: 320-33018-13

Client ID: NAWC-110217-RW-348

Operator ID: SACINSTLCMS01

ALS Bottle#: 16

Worklist Smp#: 21

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

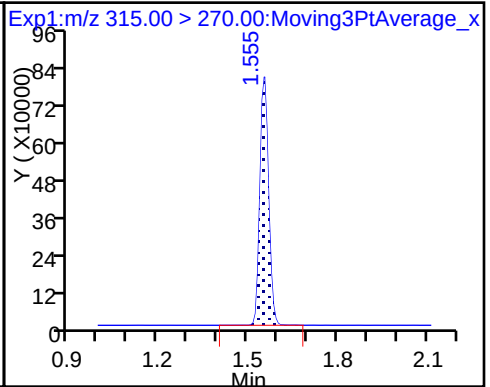
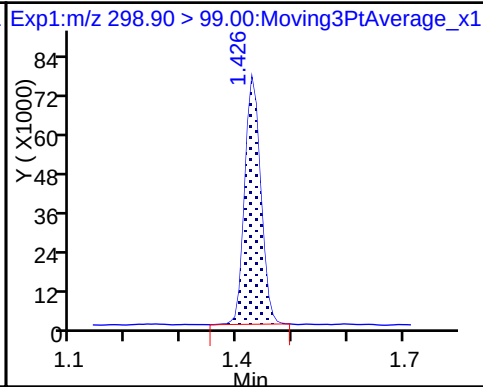
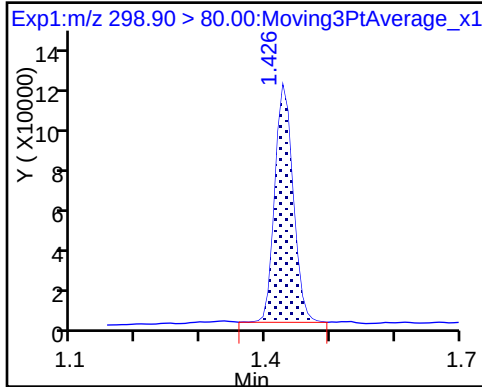
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

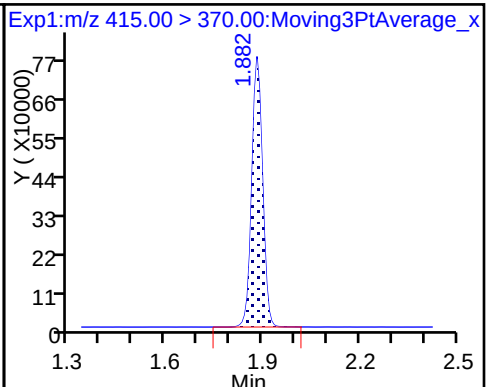
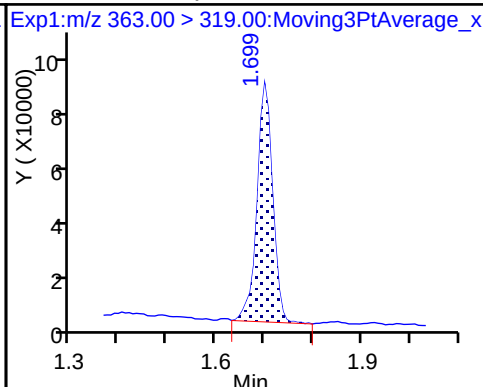
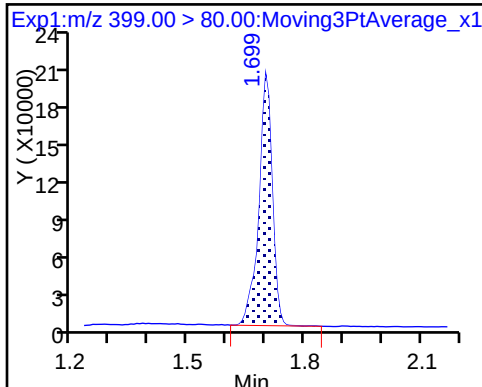
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

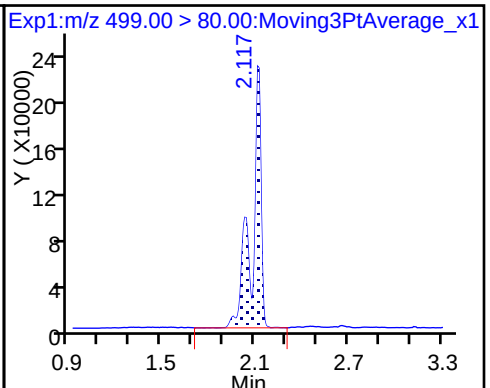
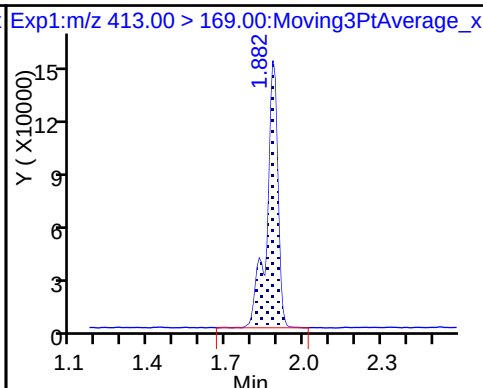
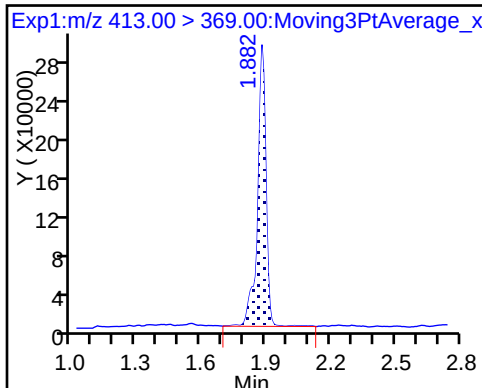
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

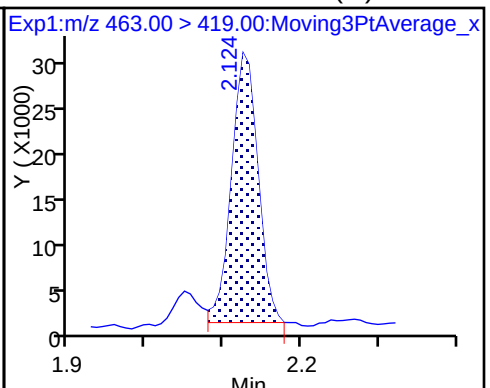
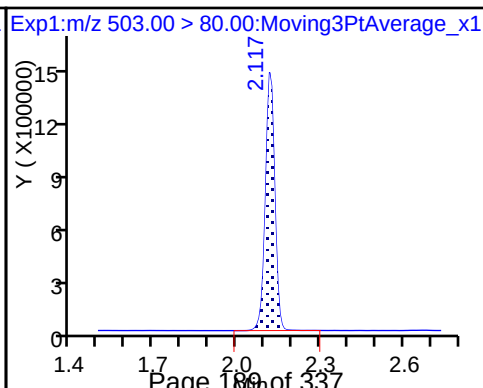
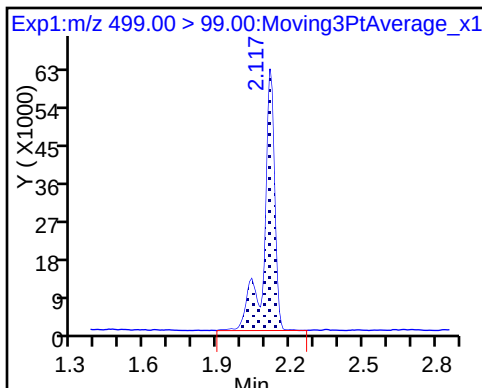
8 Perfluorooctane sulfonic acid



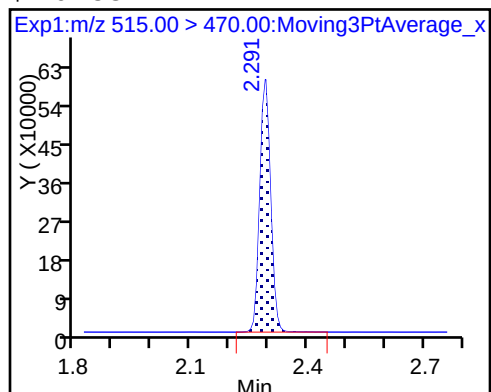
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA





TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_024.d  
Lims ID: 320-33018-A-13-A  
Client ID: NAWC-110217-RW-348  
Sample Type: Client  
Inject. Date: 13-Nov-2017 04:10:48 ALS Bottle#: 16 Worklist Smp#: 21  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-33018-a-13-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
Column 1 : Det: EXP1  
Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 17:04:36

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.16             | 81.60  |
| \$ 10 13C2 PFDA | 10.0         | 8.29             | 82.91  |

## TestAmerica Sacramento

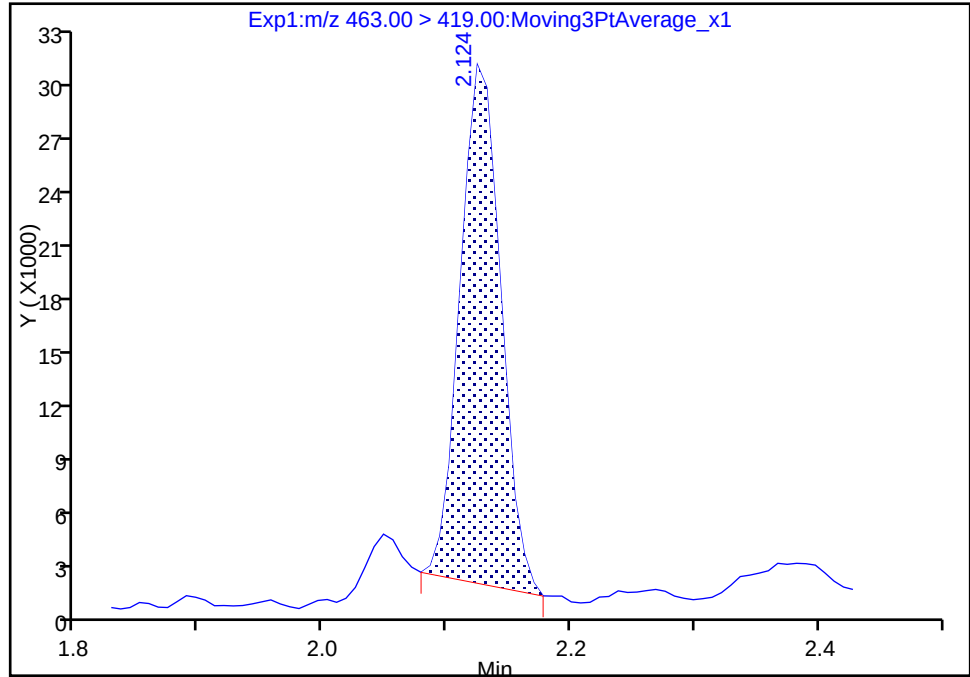
|                 |                                                                            |                |              |                |    |
|-----------------|----------------------------------------------------------------------------|----------------|--------------|----------------|----|
| Data File:      | \\ChromNa\Sacramento\ChromData\A8_N\20171113-50325.b\2017.11.13_537A_024.d |                |              |                |    |
| Injection Date: | 13-Nov-2017 04:10:48                                                       | Instrument ID: | A8_N         |                |    |
| Lims ID:        | 320-33018-A-13-A                                                           | Lab Sample ID: | 320-33018-13 |                |    |
| Client ID:      | NAWC-110217-RW-348                                                         |                |              |                |    |
| Operator ID:    | SACINSTLCMS01                                                              | ALS Bottle#:   | 16           | Worklist Smp#: | 21 |
| Injection Vol:  | 2.0 ul                                                                     | Dil. Factor:   | 1.0000       |                |    |
| Method:         | 537_A8_N                                                                   | Limit Group:   | LC 537 ICAL  |                |    |
| Column:         |                                                                            | Detector       | EXP1         |                |    |

**9 Perfluorononanoic acid, CAS: 375-95-1**

Signal: 1

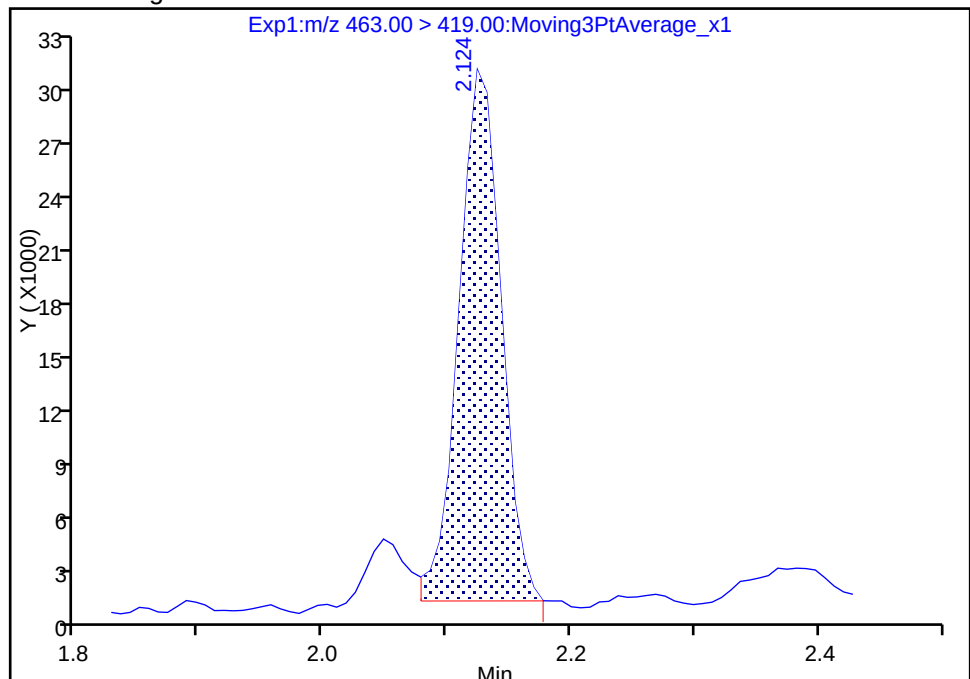
RT: 2.12  
Area: 65557  
Amount: 0.557121  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.12  
Area: 69436  
Amount: 0.590086  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: barnettj, 14-Nov-2017 17:04:27

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                              |
|----------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                               |                                              |
| Client Sample ID: <u>NAWC-110217-FRB-348</u> | Lab Sample ID: <u>320-33018-14</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2017.11.13_537A_025.d</u>    |
| Analysis Method: <u>537</u>                  | Date Collected: <u>11/02/2017 11:35</u>      |
| Extraction Method: <u>537</u>                | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>252.5 (mL)</u>             | Date Analyzed: <u>11/13/2017 04:15</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>          | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>              | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194251</u>            | Units: <u>ng/L</u>                           |

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

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 90   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 88   |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_025.d  
 Lims ID: 320-33018-A-14-A  
 Client ID: NAWC-110217-FRB-348  
 Sample Type: Client  
 Inject. Date: 13-Nov-2017 04:15:29 ALS Bottle#: 17 Worklist Smp#: 22  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-33018-a-14-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

| Signal          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits) | S/N  | Flags |
|-----------------|-------|-----------|-----------|-----------|----------|-----------------|---------------|------|-------|
| \$ 2 13C2 PFHxA |       |           |           |           |          |                 |               |      |       |
| 315.00 > 270.00 | 1.555 | 1.573     | -0.018    | 1.000     | 1608061  | 9.01            |               | 7554 |       |
| * 6 13C2-PFOA   |       |           |           |           |          |                 |               |      |       |
| 415.00 > 370.00 | 1.889 | 1.913     | -0.024    |           | 1622165  | 10.0            |               | 6630 |       |
| * 7 13C4 PFOS   |       |           |           |           |          |                 |               |      |       |
| 503.00 > 80.00  | 2.124 | 2.151     | -0.027    |           | 3163206  | 28.7            |               | 4379 |       |
| \$ 10 13C2 PFDA |       |           |           |           |          |                 |               |      |       |
| 515.00 > 470.00 | 2.299 | 2.312     | -0.013    | 1.000     | 1097610  | 8.84            |               | 7689 |       |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_025.d

Injection Date: 13-Nov-2017 04:15:29

Instrument ID: A8\_N

Lims ID: 320-33018-A-14-A

Lab Sample ID: 320-33018-14

Client ID: NAWC-110217-FRB-348

Operator ID: SACINSTLCMS01

ALS Bottle#: 17

Worklist Smp#: 22

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

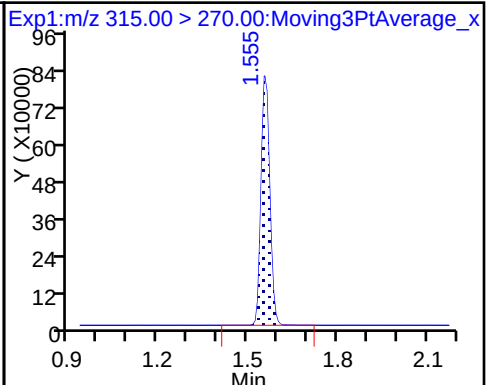
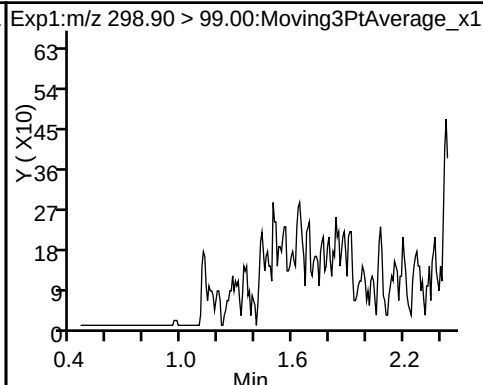
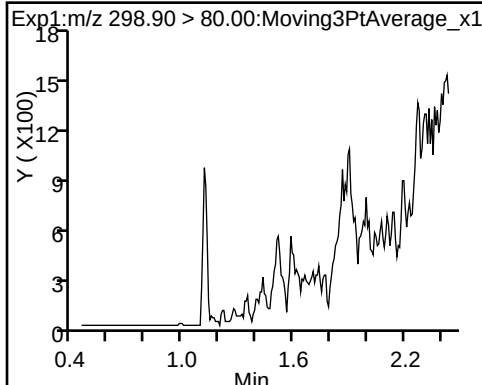
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

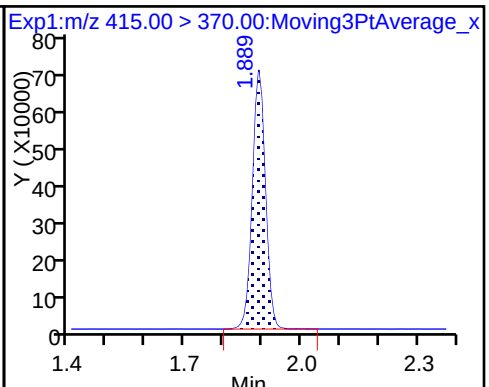
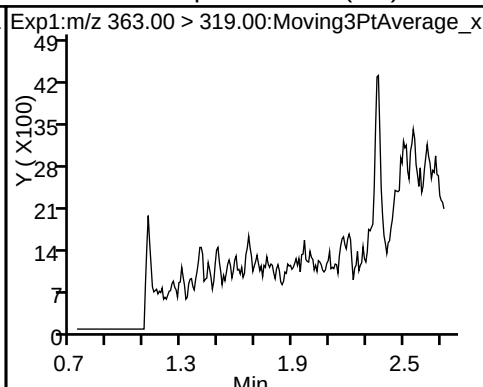
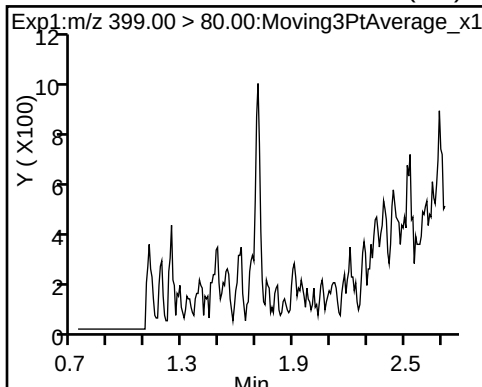
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

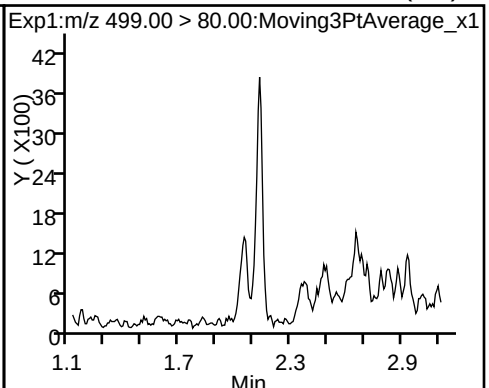
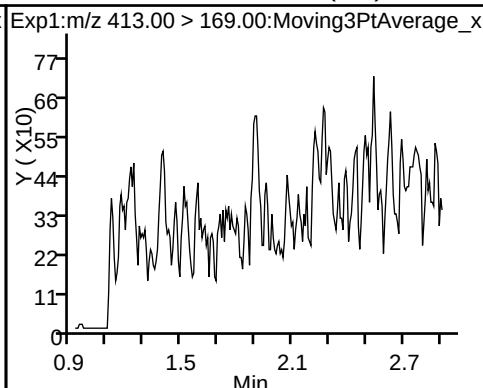
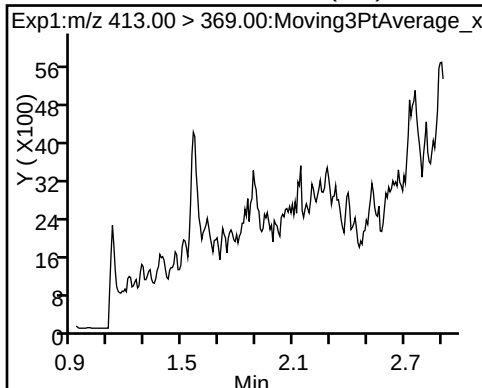
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

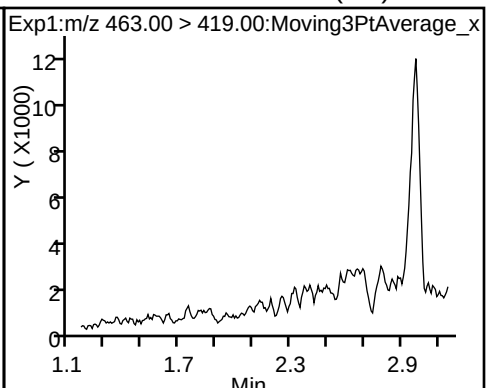
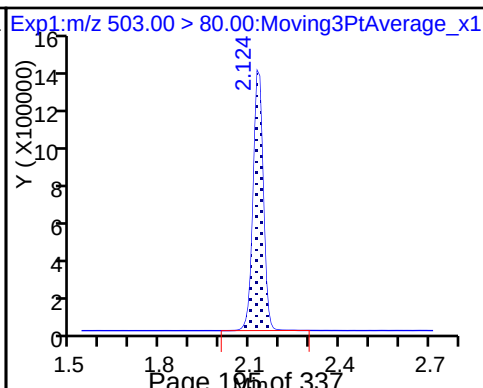
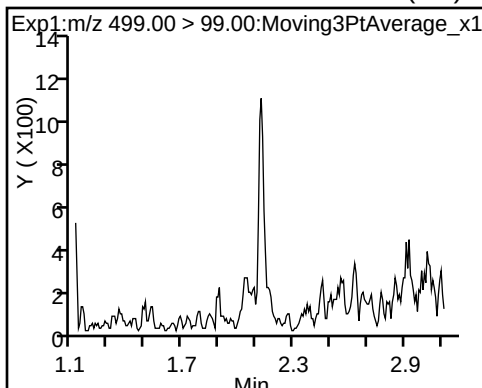
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

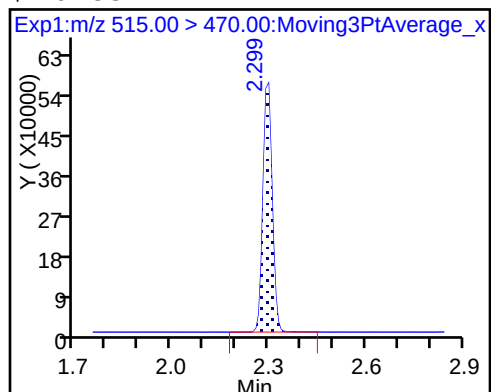


8 Perfluorooctane sulfonic acid (ND) \* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_025.d  
Lims ID: 320-33018-A-14-A  
Client ID: NAWC-110217-FRB-348  
Sample Type: Client  
Inject. Date: 13-Nov-2017 04:15:29 ALS Bottle#: 17 Worklist Smp#: 22  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-33018-a-14-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 :

Det: EXP1

Process Host: XAWRK010

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 9.01             | 90.09  |
| \$ 10 13C2 PFDA | 10.0         | 8.84             | 88.43  |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                             |
|----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-33018-1</u>                 |
| SDG No.: _____                               |                                             |
| Client Sample ID: <u>WGNA-110217-RW-3882</u> | Lab Sample ID: <u>320-33018-15</u>          |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2017.11.13_537A_026.d</u>   |
| Analysis Method: <u>537</u>                  | Date Collected: <u>11/02/2017 15:40</u>     |
| Extraction Method: <u>537</u>                | Date Extracted: <u>11/08/2017 11:47</u>     |
| Sample wt/vol: <u>250.9(mL)</u>              | Date Analyzed: <u>11/13/2017 04:20</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>           | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>194251</u>            | Units: <u>ng/L</u>                          |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q   | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|-----|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 9.0    | J   | 40  | 16  | 6.8 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.1    | J   | 20  | 8.0 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U M | 24  | 20  | 8.0 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 8.2    | J   | 30  | 12  | 5.5 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 3.7    | J   | 10  | 4.0 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 36     | U   | 90  | 36  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 83   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 84   |   | 70-130 |



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_026.d  
 Lims ID: 320-33018-A-15-A  
 Client ID: WGNA-110217-RW-3882  
 Sample Type: Client  
 Inject. Date: 13-Nov-2017 04:20:10 ALS Bottle#: 18 Worklist Smp#: 23  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-33018-a-15-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 17:05:24

| Signal                          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | S/N  | Flags |
|---------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid  |       |           |           |           |          |                 |                 |      |       |
| 298.90 > 80.00                  | 1.426 | 1.444     | -0.018    | 1.000     | 147276   | 1.16            |                 | 70.2 |       |
| 298.90 > 99.00                  | 1.426 | 1.444     | -0.018    | 1.000     | 105316   |                 | 1.40(0.00-0.00) | 240  |       |
| \$ 2 13C2 PFHxA                 |       |           |           |           |          |                 |                 |      |       |
| 315.00 > 270.00                 | 1.555 | 1.573     | -0.018    | 1.000     | 1530030  | 8.32            |                 | 6928 |       |
| 3 Perfluorohexanesulfonic acid  |       |           |           |           |          |                 |                 |      |       |
| 399.00 > 80.00                  | 1.699 | 1.725     | -0.026    | 1.000     | 392349   | 2.06            |                 | 284  |       |
| 4 Perfluoroheptanoic acid       |       |           |           |           |          |                 |                 |      |       |
| 363.00 > 319.00                 | 1.699 | 1.725     | -0.026    | 1.000     | 146093   | 0.9334          |                 | 34.0 |       |
| * 6 13C2-PFOA                   |       |           |           |           |          |                 |                 |      |       |
| 415.00 > 370.00                 | 1.882 | 1.913     | -0.031    |           | 1670566  | 10.0            |                 | 6616 |       |
| 5 Perfluorooctanoic acid        |       |           |           |           |          |                 |                 |      |       |
| 413.00 > 369.00                 | 1.882 | 1.914     | -0.032    | 1.000     | 274898   | 1.78            |                 | 44.5 |       |
| 413.00 > 169.00                 | 1.882 | 1.914     | -0.032    | 1.000     | 167172   |                 | 1.64(0.00-0.00) | 160  |       |
| 8 Perfluorooctane sulfonic acid |       |           |           |           |          |                 |                 |      |       |
| 499.00 > 80.00                  | 2.124 | 2.117     | 0.007     | 1.000     | 240635   | 2.25            |                 | 110  |       |
| 499.00 > 99.00                  | 2.117 | 2.117     | 0.0       | 0.996     | 40039    |                 | 6.01(0.00-0.00) | 71.0 |       |
| * 7 13C4 PFOS                   |       |           |           |           |          |                 |                 |      |       |
| 503.00 > 80.00                  | 2.117 | 2.151     | -0.034    |           | 3261923  | 28.7            |                 | 3593 |       |
| 9 Perfluorononanoic acid        |       |           |           |           |          |                 |                 |      |       |
| 463.00 > 419.00                 | 2.124 | 2.158     | -0.034    | 1.000     | 29461    | 0.2655          |                 | 6.8  | M     |
| \$ 10 13C2 PFDA                 |       |           |           |           |          |                 |                 |      |       |
| 515.00 > 470.00                 | 2.291 | 2.312     | -0.021    | 1.000     | 1078285  | 8.44            |                 | 7251 | M     |

## QC Flag Legend

### Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_026.d

Injection Date: 13-Nov-2017 04:20:10

Instrument ID: A8\_N

Lims ID: 320-33018-A-15-A

Lab Sample ID: 320-33018-15

Client ID: WGNA-110217-RW-3882

Operator ID: SACINSTLCMS01

ALS Bottle#: 18

Worklist Smp#: 23

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

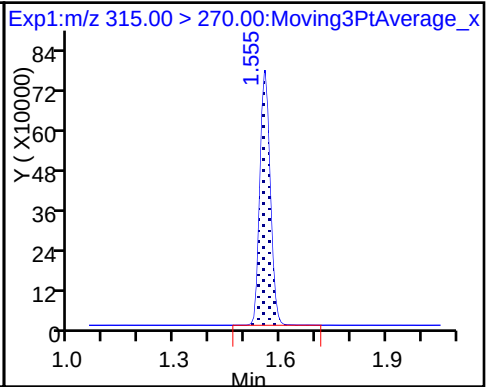
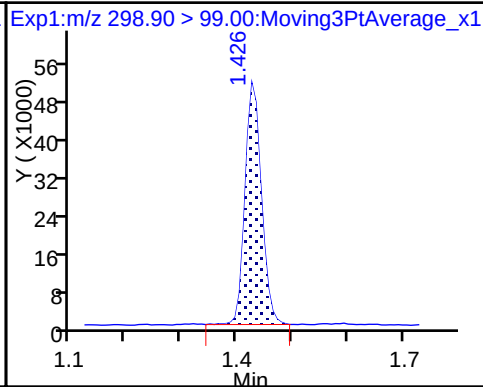
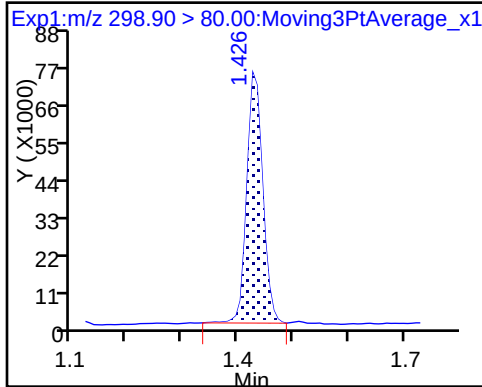
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

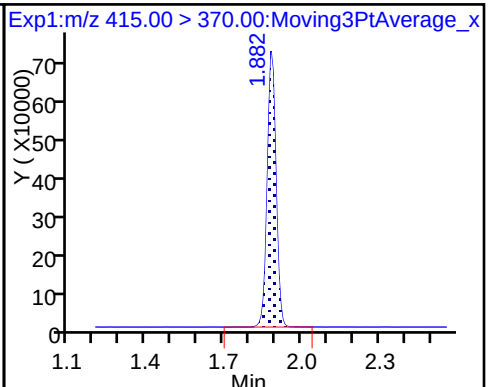
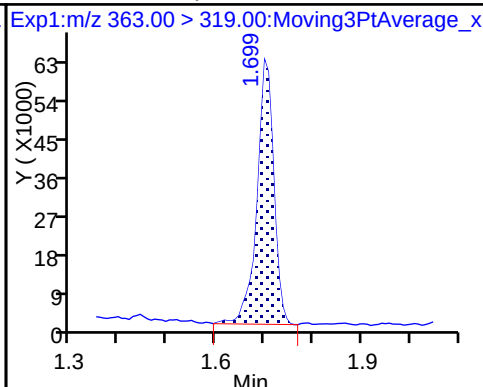
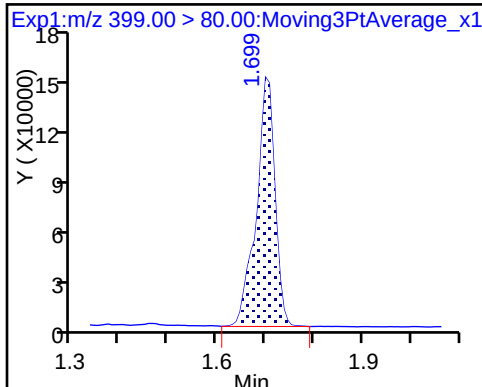
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

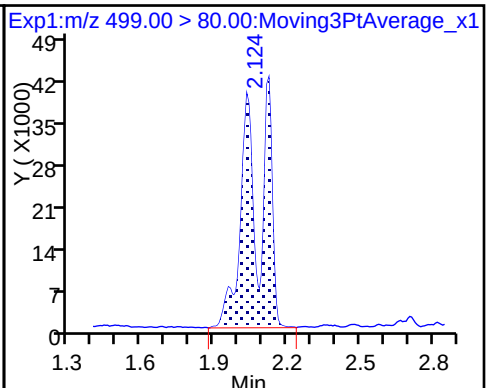
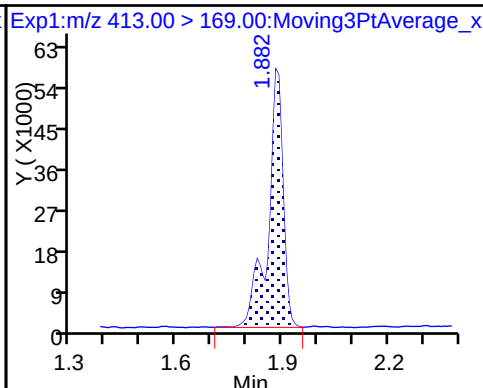
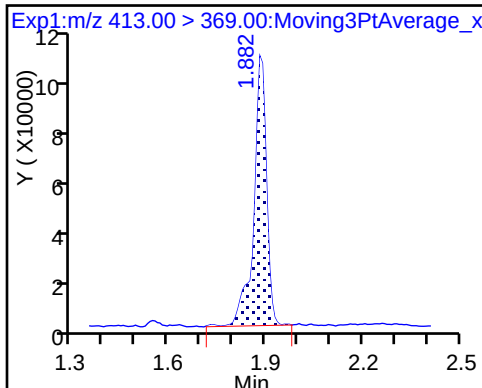
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

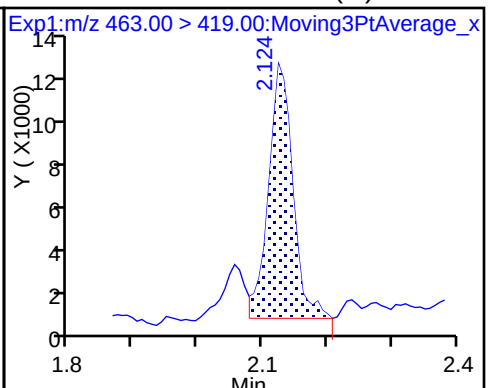
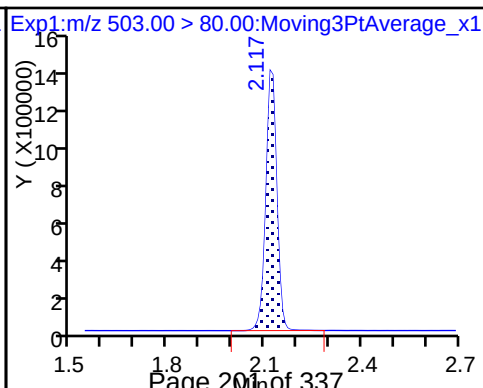
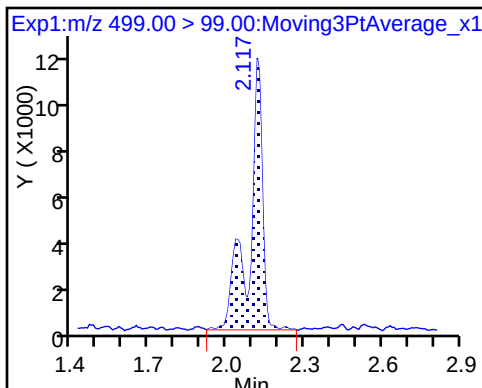
8 Perfluorooctane sulfonic acid



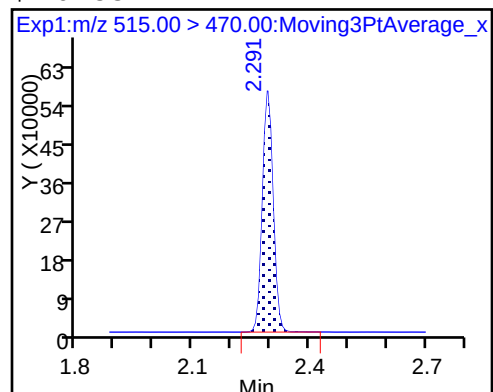
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_026.d  
Lims ID: 320-33018-A-15-A  
Client ID: WGNA-110217-RW-3882  
Sample Type: Client  
Inject. Date: 13-Nov-2017 04:20:10 ALS Bottle#: 18 Worklist Smp#: 23  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-33018-a-15-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
Column 1 : Det: EXP1  
Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 17:05:24

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.32             | 83.24  |
| \$ 10 13C2 PFDA | 10.0         | 8.44             | 84.35  |

## TestAmerica Sacramento

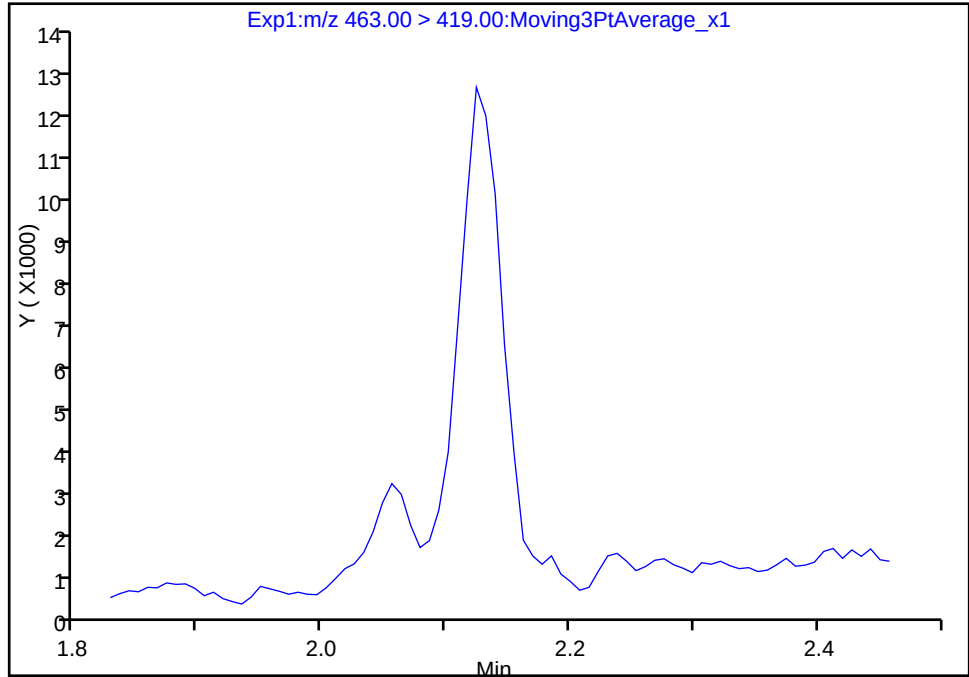
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_026.d  
Injection Date: 13-Nov-2017 04:20:10 Instrument ID: A8\_N  
Lims ID: 320-33018-A-15-A Lab Sample ID: 320-33018-15  
Client ID: WGNA-110217-RW-3882  
Operator ID: SACINSTLCMS01 ALS Bottle#: 18 Worklist Smp#: 23  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

**9 Perfluorononanoic acid, CAS: 375-95-1**

Signal: 1

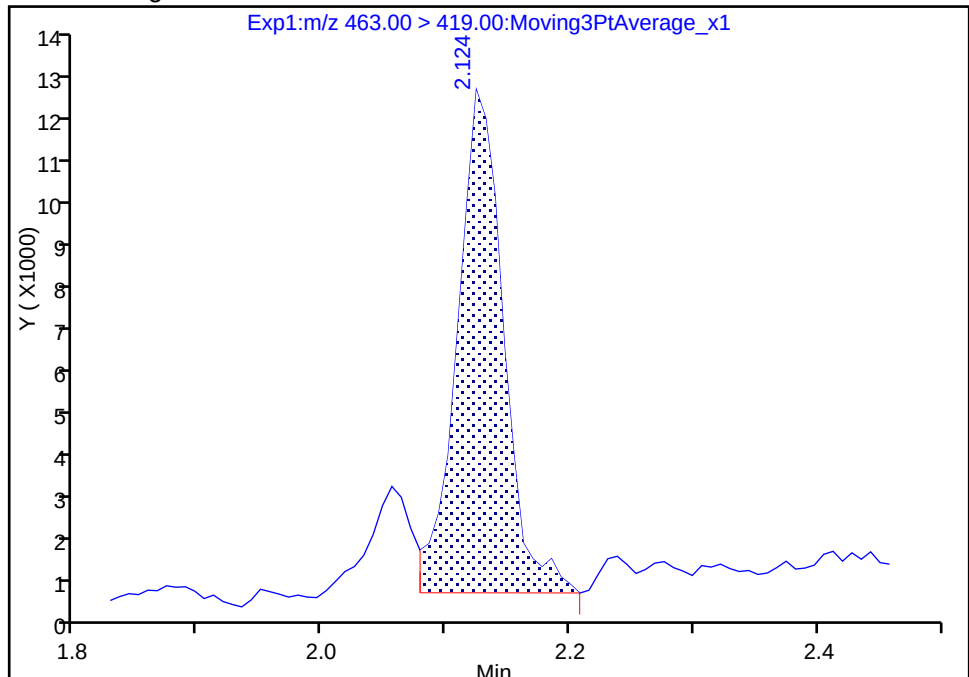
Not Detected  
Expected RT: 2.16

## Processing Integration Results



RT: 2.12  
Area: 29461  
Amount: 0.265528  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: barnettj, 14-Nov-2017 17:05:08  
Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                               |                                             |
|-----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>       | Job No.: <u>320-33018-1</u>                 |
| SDG No.: _____                                |                                             |
| Client Sample ID: <u>WGNA-110217-FRB-3882</u> | Lab Sample ID: <u>320-33018-16</u>          |
| Matrix: <u>Water</u>                          | Lab File ID: <u>2017.11.13_537A_027.d</u>   |
| Analysis Method: <u>537</u>                   | Date Collected: <u>11/02/2017 15:35</u>     |
| Extraction Method: <u>537</u>                 | Date Extracted: <u>11/08/2017 11:47</u>     |
| Sample wt/vol: <u>247.9(mL)</u>               | Date Analyzed: <u>11/13/2017 04:24</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>            | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>                | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                             | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>194251</u>             | Units: <u>ng/L</u>                          |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 40  | 16  | 6.9 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 8.1    | U | 20  | 8.1 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 8.1 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 30  | 12  | 5.5 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 4.0    | U | 10  | 4.0 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 36     | U | 91  | 36  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 85   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 86   |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_027.d  
 Lims ID: 320-33018-A-16-A  
 Client ID: WGNA-110217-FRB-3882  
 Sample Type: Client  
 Inject. Date: 13-Nov-2017 04:24:51 ALS Bottle#: 19 Worklist Smp#: 24  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-33018-a-16-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

| Signal          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits) | S/N  | Flags |
|-----------------|-------|-----------|-----------|-----------|----------|-----------------|---------------|------|-------|
| \$ 2 13C2 PFHxA |       |           |           |           |          |                 |               |      |       |
| 315.00 > 270.00 | 1.555 | 1.573     | -0.018    | 1.000     | 1565063  | 8.46            |               | 5978 |       |
| * 6 13C2-PFOA   |       |           |           |           |          |                 |               |      |       |
| 415.00 > 370.00 | 1.882 | 1.913     | -0.031    |           | 1680590  | 10.0            |               | 6439 |       |
| * 7 13C4 PFOS   |       |           |           |           |          |                 |               |      |       |
| 503.00 > 80.00  | 2.124 | 2.151     | -0.027    |           | 3129778  | 28.7            |               | 4835 |       |
| \$ 10 13C2 PFDA |       |           |           |           |          |                 |               |      |       |
| 515.00 > 470.00 | 2.291 | 2.312     | -0.021    | 1.000     | 1100409  | 8.56            |               | 7335 |       |



## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_027.d

Injection Date: 13-Nov-2017 04:24:51

Instrument ID: A8\_N

Lims ID: 320-33018-A-16-A

Lab Sample ID: 320-33018-16

Client ID: WGNA-110217-FRB-3882

Operator ID: SACINSTLCMS01

ALS Bottle#: 19

Worklist Smp#: 24

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

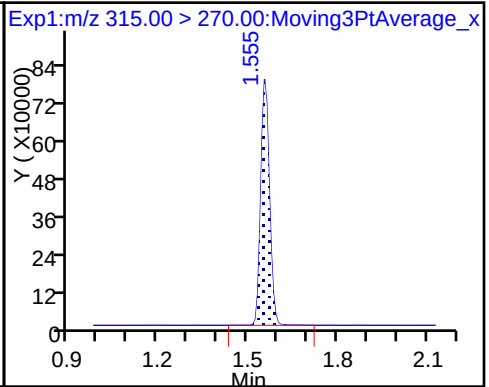
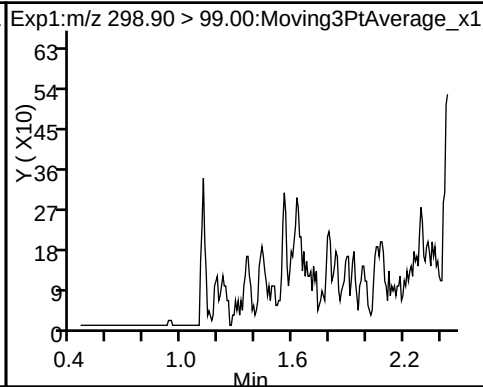
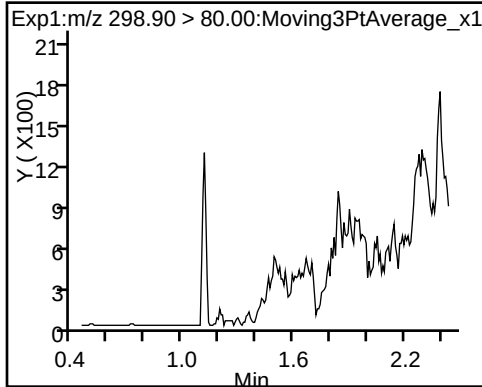
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

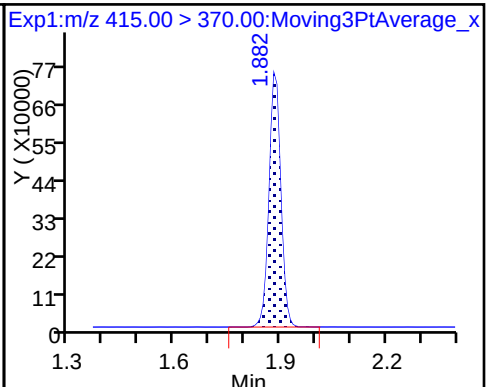
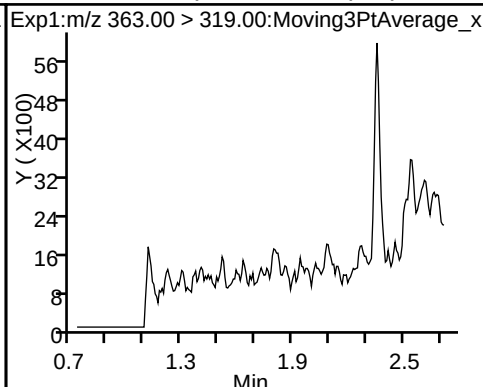
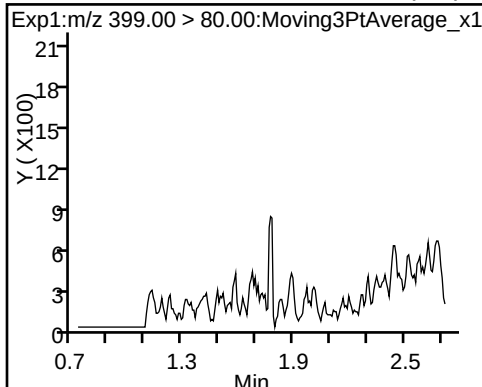
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

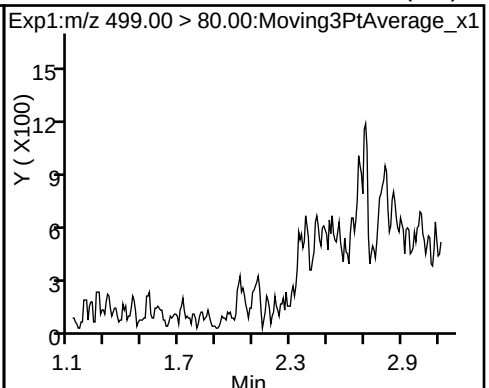
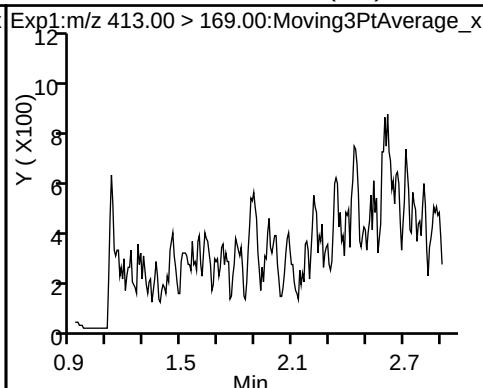
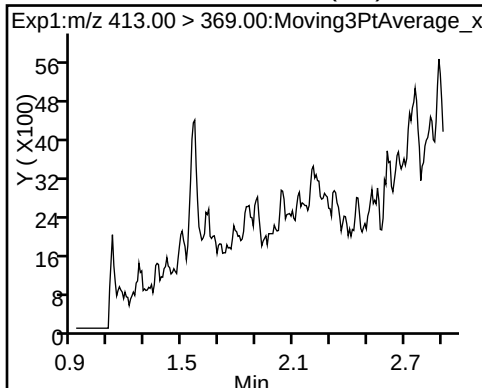
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

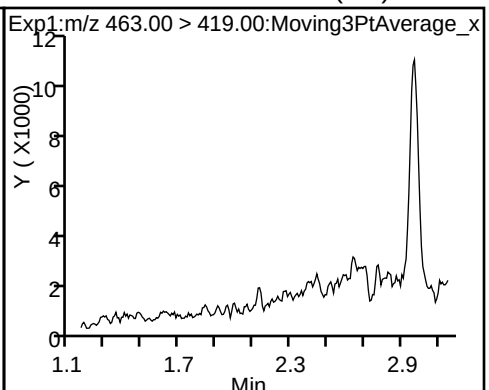
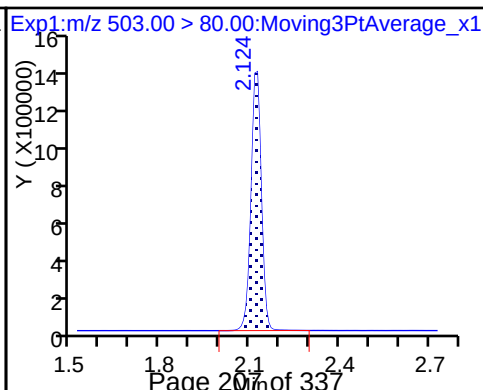
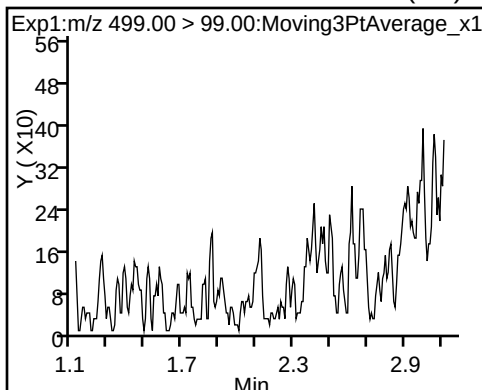
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

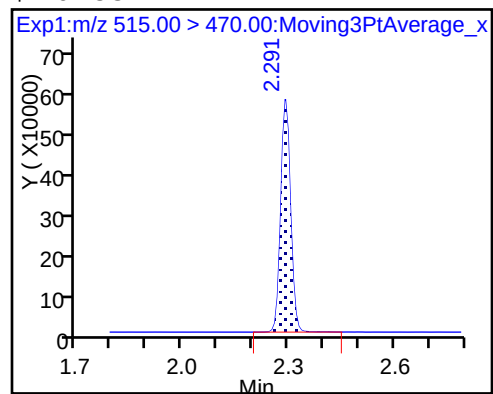


8 Perfluorooctane sulfonic acid (ND) \* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_027.d  
Lims ID: 320-33018-A-16-A  
Client ID: WGNA-110217-FRB-3882  
Sample Type: Client  
Inject. Date: 13-Nov-2017 04:24:51 ALS Bottle#: 19 Worklist Smp#: 24  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-33018-a-16-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.46             | 84.64  |
| \$ 10 13C2 PFDA | 10.0         | 8.56             | 85.57  |

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

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1 Analy Batch No.: 192908

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

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

Calibration Files:

| LEVEL:  | LAB SAMPLE ID:  | LAB FILE ID:              |
|---------|-----------------|---------------------------|
| Level 1 | IC 320-192908/4 | 2017.11.03_537XICAL_004.d |
| Level 2 | IC 320-192908/5 | 2017.11.03_537XICAL_005.d |
| Level 3 | IC 320-192908/6 | 2017.11.03_537XICAL_006.d |
| Level 4 | IC 320-192908/7 | 2017.11.03_537XICAL_007.d |
| Level 5 | IC 320-192908/8 | 2017.11.03_537XICAL_008.d |
| Level 6 | IC 320-192908/9 | 2017.11.03_537XICAL_009.d |

| ANALYTE                              | RRF              |        |        |        |        | CURVE<br>TYPE | COEFFICIENT |        |           | # | MIN RRF | %RSD | # | MAX<br>%RSD | R^2<br>OR COD | # | MIN R^2<br>OR COD |
|--------------------------------------|------------------|--------|--------|--------|--------|---------------|-------------|--------|-----------|---|---------|------|---|-------------|---------------|---|-------------------|
|                                      | LVL 1<br>LVL 6   | LVL 2  | LVL 3  | LVL 4  | LVL 5  |               | B           | M1     | M2        |   |         |      |   |             |               |   |                   |
| Perfluorobutanesulfonic acid (PFBS)  | 1.0397<br>0.8468 | 1.0767 | 1.0898 | 0.9577 | 0.9303 | QuaF          |             | 1.1193 | -0.001498 |   |         |      |   |             | 0.9990        |   | 0.9600            |
| Perfluoroheptanoic acid (PFHpA)      | 0.9433<br>0.9848 | 0.9187 | 0.9551 | 0.9185 | 0.9011 | Ave           |             | 0.9369 |           |   |         | 3.2  |   | 30.0        |               |   |                   |
| Perfluorohexanesulfonic acid (PFHxS) | 1.6459<br>1.6841 | 1.6355 | 1.7405 | 1.6631 | 1.6755 | Ave           |             | 1.6741 |           |   |         | 2.2  |   | 30.0        |               |   |                   |
| Perfluorooctanoic acid (PFOA)        | 0.9757<br>0.9799 | 0.8919 | 0.9000 | 0.8953 | 0.9117 | Ave           |             | 0.9258 |           |   |         | 4.4  |   | 30.0        |               |   |                   |
| Perfluorooctanesulfonic acid (PFOS)  | 0.8958<br>0.9902 | 0.9213 | 0.9281 | 0.9268 | 0.9715 | Ave           |             | 0.9389 |           |   |         | 3.7  |   | 30.0        |               |   |                   |
| Perfluorononanoic acid (PFNA)        | 0.6610<br>0.7042 | 0.6285 | 0.6624 | 0.6810 | 0.6478 | Ave           |             | 0.6642 |           |   |         | 3.9  |   | 30.0        |               |   |                   |
| 13C2 PFHxA                           | 1.0891<br>1.1664 | 1.0526 | 1.1042 | 1.1123 | 1.0772 | Ave           |             | 1.1003 |           |   |         | 3.5  |   | 30.0        |               |   |                   |
| 13C2 PFDA                            | 0.7748<br>0.8159 | 0.7295 | 0.7569 | 0.7811 | 0.7330 | Ave           |             | 0.7652 |           |   |         | 4.3  |   | 30.0        |               |   |                   |

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI  
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA  
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1 Analy Batch No.: 192908

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

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

Calibration Files:

|         |                 |                           |
|---------|-----------------|---------------------------|
| LEVEL:  | LAB SAMPLE ID:  | LAB FILE ID:              |
| Level 1 | IC 320-192908/4 | 2017.11.03_537XICAL_004.d |
| Level 2 | IC 320-192908/5 | 2017.11.03_537XICAL_005.d |
| Level 3 | IC 320-192908/6 | 2017.11.03_537XICAL_006.d |
| Level 4 | IC 320-192908/7 | 2017.11.03_537XICAL_007.d |
| Level 5 | IC 320-192908/8 | 2017.11.03_537XICAL_008.d |
| Level 6 | IC 320-192908/9 | 2017.11.03_537XICAL_009.d |

| ANALYTE                                 | IS<br>REF  | CURVE<br>TYPE | RESPONSE            |         |         |          |          | CONCENTRATION (NG/ML) |       |       |       |       |
|-----------------------------------------|------------|---------------|---------------------|---------|---------|----------|----------|-----------------------|-------|-------|-------|-------|
|                                         |            |               | LVL 1<br>LVL 6      | LVL 2   | LVL 3   | LVL 4    | LVL 5    | LVL 1<br>LVL 6        | LVL 2 | LVL 3 | LVL 4 | LVL 5 |
| Perfluorobutanesulfonic acid (PFBS)     | PFOS       | QuaF          | 1076553<br>16699152 | 2591121 | 5461974 | 10142530 | 14011858 | 9.00<br>180           | 20.0  | 45.0  | 90.0  | 135   |
| Perfluoroheptanoic acid (PFHpA)         | 13PF<br>OA | Ave           | 143455<br>2810797   | 331548  | 736034  | 1420703  | 2102676  | 1.00<br>20.0          | 2.22  | 5.00  | 10.0  | 15.0  |
| Perfluorohexanesulfonic acid<br>(PFHxS) | PFOS       | Ave           | 568156<br>11071993  | 1312135 | 2908204 | 5871843  | 8413133  | 3.00<br>60.0          | 6.67  | 15.0  | 30.0  | 45.0  |
| Perfluorooctanoic acid (PFOA)           | 13PF<br>OA | Ave           | 296934<br>5597122   | 644149  | 1388033 | 2771271  | 4257225  | 2.00<br>40.0          | 4.45  | 10.0  | 20.0  | 30.0  |
| Perfluorooctanesulfonic acid (PFOS)     | PFOS       | Ave           | 412315<br>8679676   | 985487  | 2067792 | 4363079  | 6504279  | 4.00<br>80.0          | 8.89  | 20.0  | 40.0  | 60.0  |
| Perfluorononanoic acid (PFNA)           | 13PF<br>OA | Ave           | 201053<br>4019666   | 453612  | 1020851 | 2106479  | 3023088  | 2.00<br>40.0          | 4.45  | 10.0  | 20.0  | 30.0  |
| 13C2 PFHxA                              | 13PF<br>OA | Ave           | 1655691<br>1664260  | 1708988 | 1701491 | 1719911  | 1675220  | 10.0<br>10.0          | 10.0  | 10.0  | 10.0  | 10.0  |
| 13C2 PFDA                               | 13PF<br>OA | Ave           | 1177922<br>1164156  | 1184358 | 1166275 | 1207887  | 1139992  | 10.0<br>10.0          | 10.0  | 10.0  | 10.0  | 10.0  |

Curve Type Legend:

|                                   |
|-----------------------------------|
| Ave = Average ISTD                |
| QuaF = Quadratic ISTD forced zero |

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

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1 Analy Batch No.: 192908

SDG No.: \_\_\_\_\_

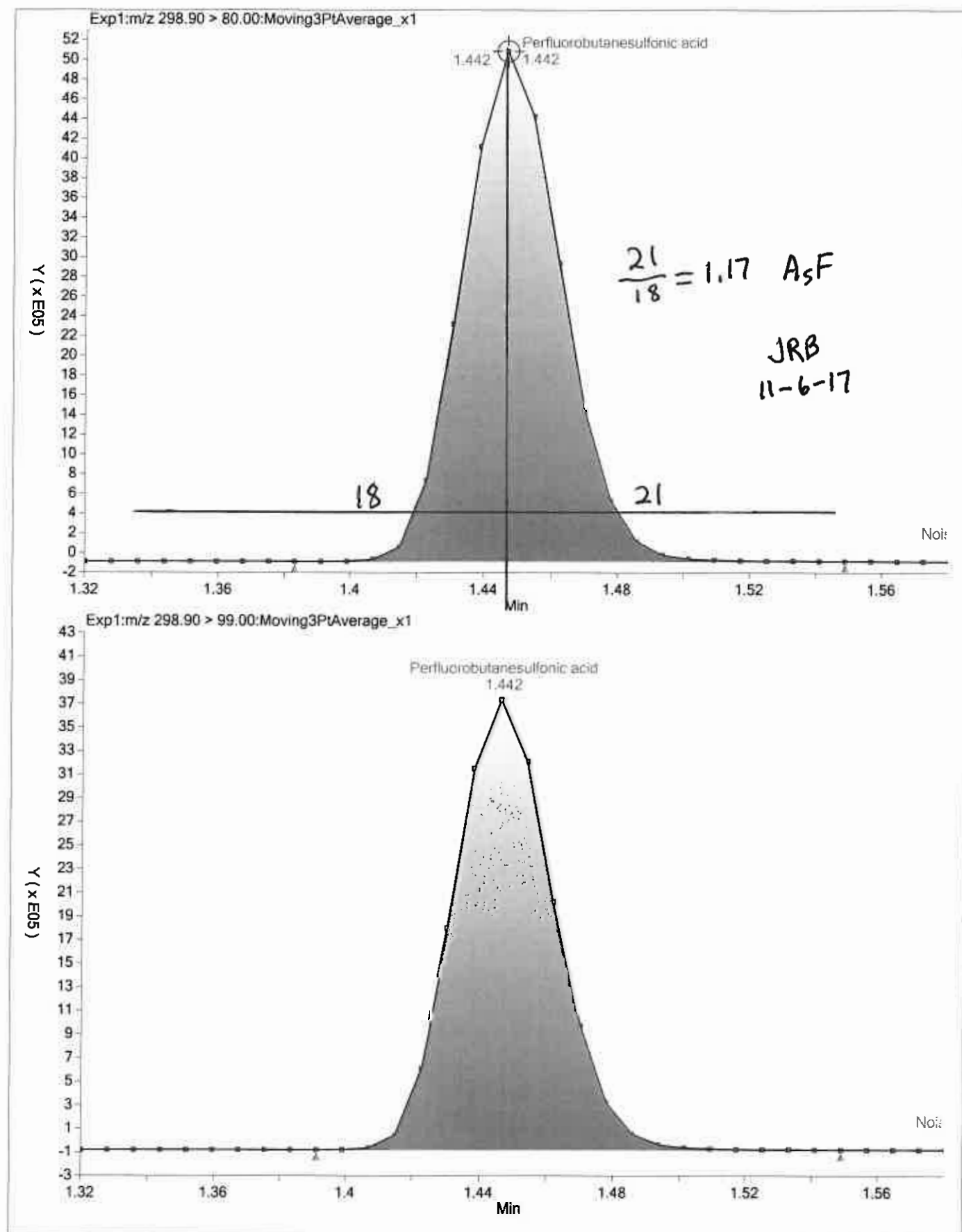
Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

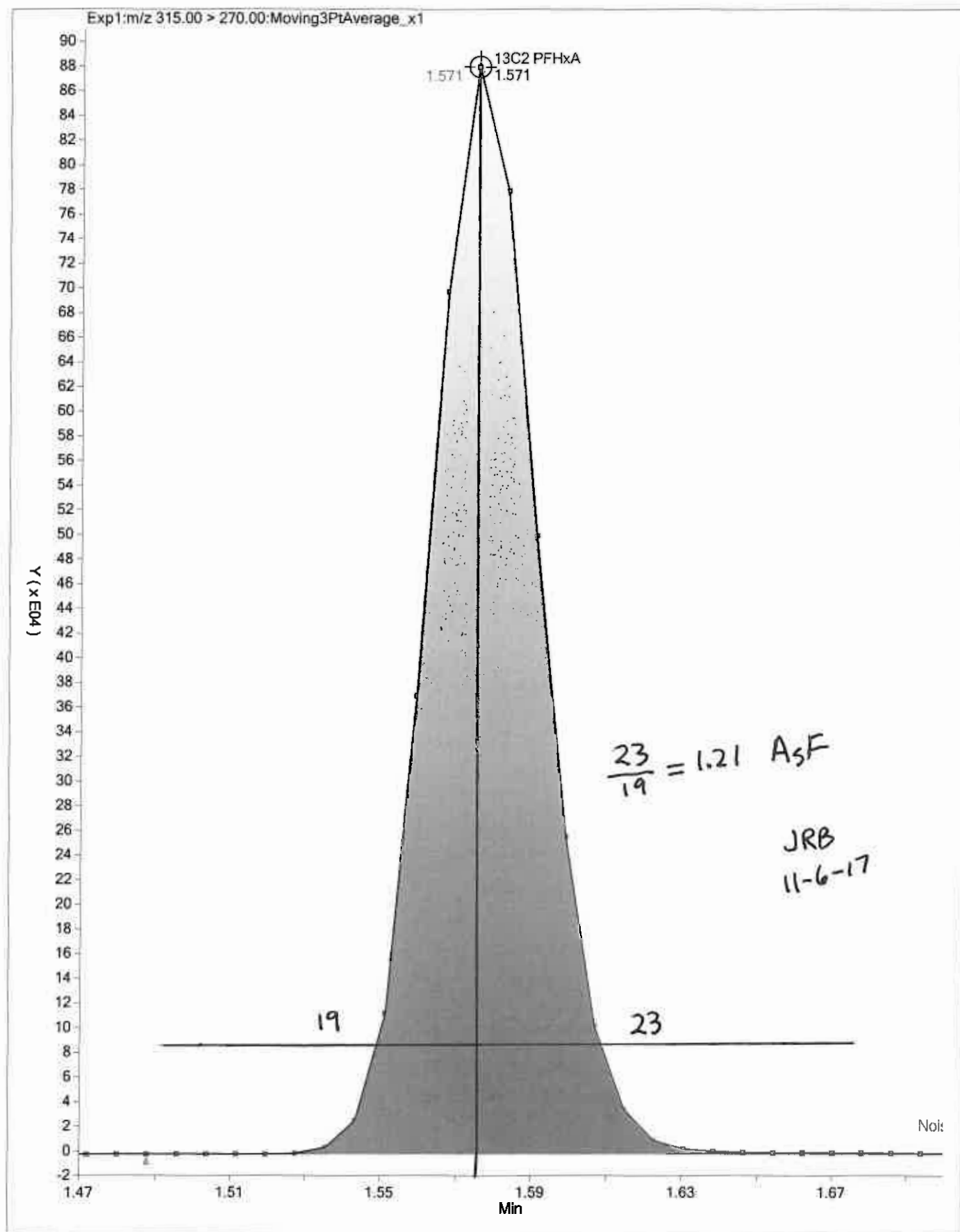
Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

Calibration Files:

| LEVEL:  | LAB SAMPLE ID:  | LAB FILE ID:              |
|---------|-----------------|---------------------------|
| Level 1 | IC 320-192908/4 | 2017.11.03_537XICAL_004.d |
| Level 2 | IC 320-192908/5 | 2017.11.03_537XICAL_005.d |
| Level 3 | IC 320-192908/6 | 2017.11.03_537XICAL_006.d |
| Level 4 | IC 320-192908/7 | 2017.11.03_537XICAL_007.d |
| Level 5 | IC 320-192908/8 | 2017.11.03_537XICAL_008.d |
| Level 6 | IC 320-192908/9 | 2017.11.03_537XICAL_009.d |

| ANALYTE                              | PERCENT ERROR |         |         |         |         |         | PERCENT ERROR LIMIT |       |       |       |       |       |
|--------------------------------------|---------------|---------|---------|---------|---------|---------|---------------------|-------|-------|-------|-------|-------|
|                                      | LVL 1 #       | LVL 2 # | LVL 3 # | LVL 4 # | LVL 5 # | LVL 6 # | LVL 1               | LVL 2 | LVL 3 | LVL 4 | LVL 5 | LVL 6 |
| Perfluorobutanesulfonic acid (PFBS)  | -6.0          | -1.2    | 3.9     | -3.1    | 1.9     | -0.5    | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluoroheptanoic acid (PFHpA)      | 0.7           | -1.9    | 1.9     | -2.0    | -3.8    | 5.1     | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluorohexanesulfonic acid (PFHxS) | -1.7          | -2.3    | 4.0     | -0.7    | 0.1     | 0.6     | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluorooctanoic acid (PFOA)        | 5.4           | -3.7    | -2.8    | -3.3    | -1.5    | 5.8     | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluorooctanesulfonic acid (PFOS)  | -4.6          | -1.9    | -1.2    | -1.3    | 3.5     | 5.5     | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluorononanoic acid (PFNA)        | -0.5          | -5.4    | -0.3    | 2.5     | -2.5    | 6.0     | 50                  | 30    | 30    | 30    | 30    | 30    |
| 13C2 PFHxA                           | -1.0          | -4.3    | 0.4     | 1.1     | -2.1    | 6.0     | 30                  | 30    | 30    | 30    | 30    | 30    |
| 13C2 PFDA                            | 1.3           | -4.7    | -1.1    | 2.1     | -4.2    | 6.6     | 30                  | 30    | 30    | 30    | 30    | 30    |







TestAmerica Laboratories  
Istd/Surrogate Recovery Report

Worklist Name: 03NOV2017\_537A\_ICAL

Worklist Num: 49975

Instrument: A8\_N

Method: 537\_A8\_N

Batch Directory: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b

Limit Group: LC 537 ICAI

Analysis Type: SemiVOA

Inj Volume: 2.00

Inj Vol Units: ul

Lims Batch: 192908

CCV IS Mode: Select Ical Level, Cal Level: 3

Non-Cal IS Mode: Last Ccal Sample

\$ 2 13C2 PFHxA

\$ 10 13C2 PFDA

| Lab ID    | Inj Date             | \$ 2           | \$ 10          | * 6 13C2-PFOA   | * 7 13C4 PFOS   |
|-----------|----------------------|----------------|----------------|-----------------|-----------------|
| IS Std    |                      |                |                | 2864400 1.87    | 6253426 2.11    |
| # 1 RB    | 03-Nov-2017 13:23:59 |                |                | 1485386 51.9    | 3471256 55.5    |
| # 2 RB    | 03-Nov-2017 13:28:38 |                |                | 1511056 52.8    | 3340239 53.4    |
| # 3 RB    | 03-Nov-2017 13:33:19 |                |                | 1483949 51.8    | 3285228 52.5    |
| IS Std    |                      |                |                |                 |                 |
| # 4 IC L1 | 03-Nov-2017 13:37:59 | 1.58<br>98.98  | 2.31<br>101.30 | 1520258> 100.0* | 3298877> 100.0* |
| # 5 IC L2 | 03-Nov-2017 13:42:39 | 1.58<br>95.66  | 2.31<br>95.33  | 1623614> 106.8* | 3450592> 104.6* |
| # 6 IC L3 | 03-Nov-2017 13:47:20 | 1.57<br>100.40 | 2.31<br>98.91  | 1540946> 101.4* | 3194016> 96.8*  |
| # 7 IC L4 | 03-Nov-2017 13:52:00 | 1.57<br>101.10 | 2.31<br>102.10 | 1546307> 101.7* | 3374600> 102.3* |
| # 8 IC L5 | 03-Nov-2017 13:56:41 | 1.57<br>97.90  | 2.31<br>95.80  | 1555174> 102.3* | 3199479> 97.0*  |
| # 9 IC L6 | 03-Nov-2017 14:01:24 | 1.57<br>106.00 | 2.31<br>106.60 | 1426806> 93.9*  | 3141787> 95.2*  |
| IS Std    |                      |                |                | 1540946 1.91    | 3194016 2.15    |
| #10 RB    | 03-Nov-2017 14:06:04 |                |                | 1395383 90.6    | 3212781 100.6   |
| IS Std    |                      |                |                | 1546307 1.91    | 3374600 2.16    |
| #11 CCVL  | 03-Nov-2017 14:10:44 | 1.58<br>97.03  | 2.31<br>97.49  | 1586829 102.6   | 3305852 98.0    |
| IS Std    |                      |                |                | 1586829 1.91    | 3305852 2.15    |
| #12 RB    | 03-Nov-2017 14:15:23 |                |                | 1415042 89.2    | 3122656 94.5    |
| IS Std    |                      |                |                | 1546307 1.91    | 3374600 2.16    |
| #13 ICV   | 03-Nov-2017 14:20:03 | 1.57<br>94.41  | 2.31<br>96.59  | 1512045 97.8    | 3433628 101.7   |
| IS Std    |                      |                |                | 1395100 1.91    | 3254950 2.15    |
| #14 RB    | 03-Nov-2017 14:24:44 |                |                | 1395100 100.0   | 3254950 100.0   |

13C2-PFOA

$$RPD = \frac{1623614 - 1426806}{\left( \frac{1623614 + 1426806}{2} \right)} (100) = 12.9$$

13C4-PFOS

$$RPD = \frac{3450592 - 3141787}{\left( \frac{3450592 + 3141787}{2} \right)} (100) = 9.37$$

JRB  
11-6-17

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_004.d  
 Lims ID: IC L1  
 Client ID:  
 Sample Type: IC Calib Level: 1  
 Inject. Date: 03-Nov-2017 13:37:59 ALS Bottle#: 1 Worklist Smp#: 4  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L1\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Nov-2017 15:52:07 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK021

First Level Reviewer: phomsophat

Date: 06-Nov-2017 07:18:01

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N  | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |      |       |
| 298.90 > 80.00                  | 1.449 | 1.444  | 0.005  | 1.000  | 1076553  | 8.46         |                 | 654  |       |
| 298.90 > 99.00                  | 1.449 | 1.444  | 0.005  | 1.000  | 763262   |              | 1.41(0.00-0.00) | 2025 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |      |       |
| 315.00 > 270.00                 | 1.578 | 1.573  | 0.005  | 1.000  | 1655691  | 9.90         |                 | 8732 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |      |       |
| 399.00 > 80.00                  | 1.730 | 1.725  | 0.005  | 1.000  | 568156   | 2.95         |                 | 1122 |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |      |       |
| 363.00 > 319.00                 | 1.730 | 1.725  | 0.005  | 1.000  | 143455   | 1.01         |                 | 42.2 |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |      |       |
| 415.00 > 370.00                 | 1.920 | 1.913  | 0.007  |        | 1520258  | 10.0         |                 | 6863 |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |      |       |
| 413.00 > 369.00                 | 1.920 | 1.914  | 0.006  | 1.000  | 296934   | 2.11         |                 | 53.5 |       |
| 413.00 > 169.00                 | 1.920 | 1.914  | 0.006  | 1.000  | 149720   |              | 1.98(0.00-0.00) | 184  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |      |       |
| 499.00 > 80.00                  | 2.155 | 2.147  | 0.008  | 1.000  | 412315   | 3.82         |                 | 235  | M     |
| 499.00 > 99.00                  | 2.155 | 2.147  | 0.008  | 1.000  | 85347    |              | 4.83(0.00-0.00) | 209  | M     |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |      |       |
| 503.00 > 80.00                  | 2.155 | 2.151  | 0.004  |        | 3298877  | 28.7         |                 | 5279 |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |      |       |
| 463.00 > 419.00                 | 2.162 | 2.158  | 0.004  | 1.000  | 201053   | 1.99         |                 | 67.8 |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |      |       |
| 515.00 > 470.00                 | 2.314 | 2.312  | 0.002  | 1.000  | 1177922  | 10.1         |                 | 7012 |       |

## QC Flag Legend

### Review Flags

M - Manually Integrated

## Reagents:

LC537-L1\_00020

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_004.d

Injection Date: 03-Nov-2017 13:37:59

Instrument ID: A8\_N

Lims ID: IC L1

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 1

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

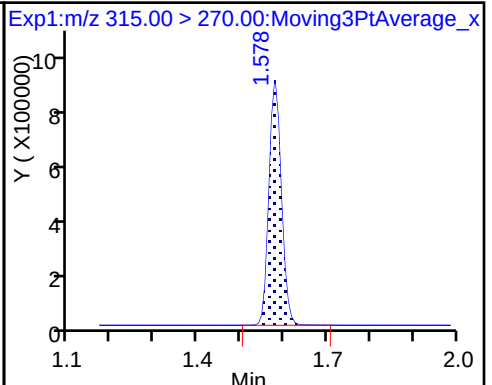
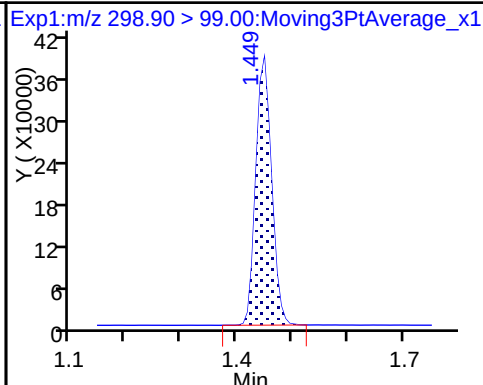
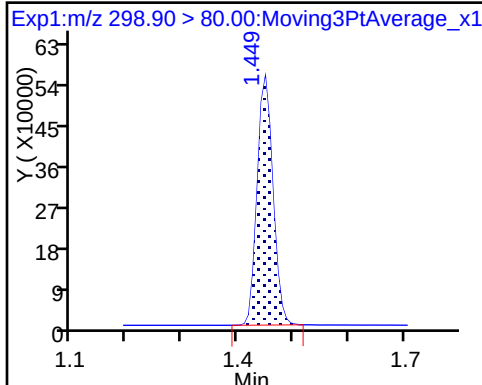
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

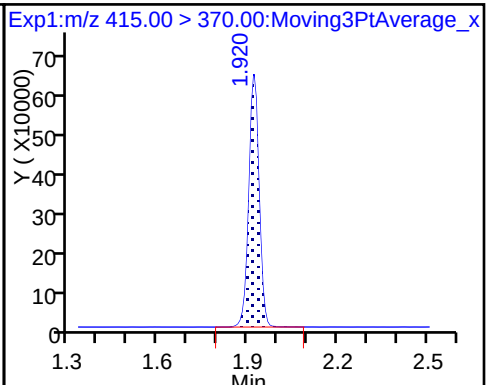
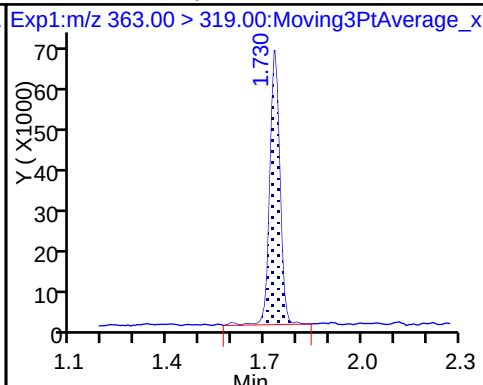
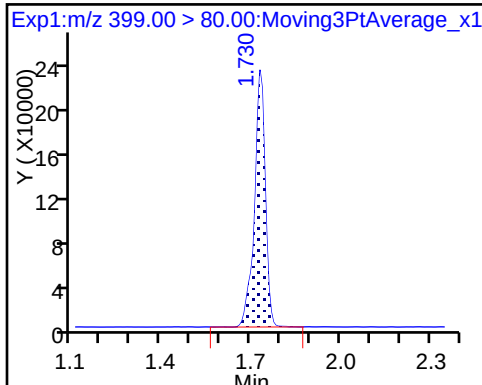
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

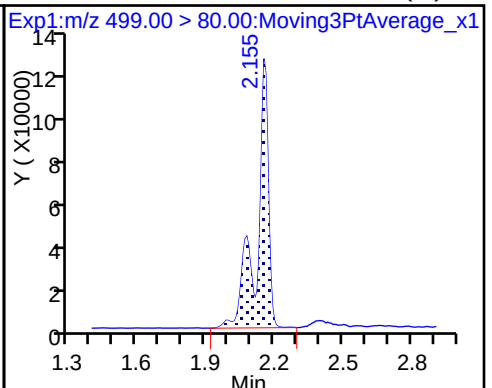
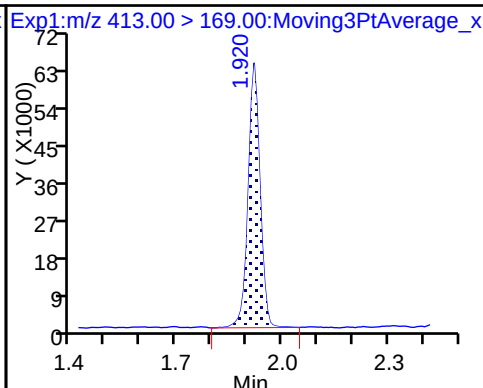
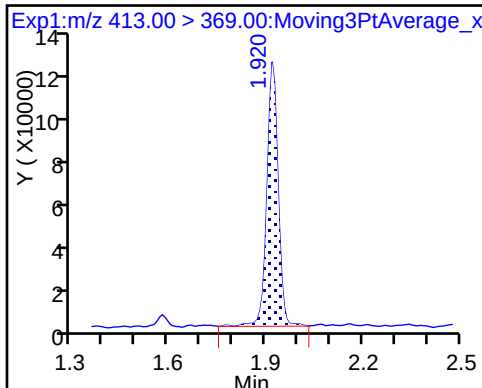
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

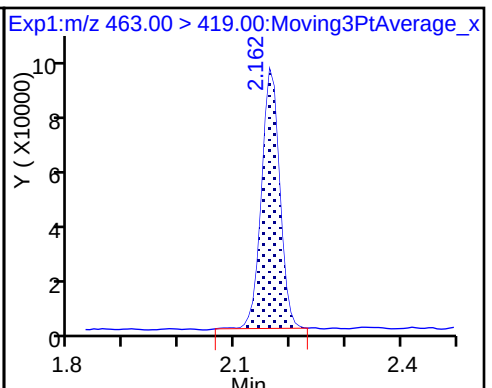
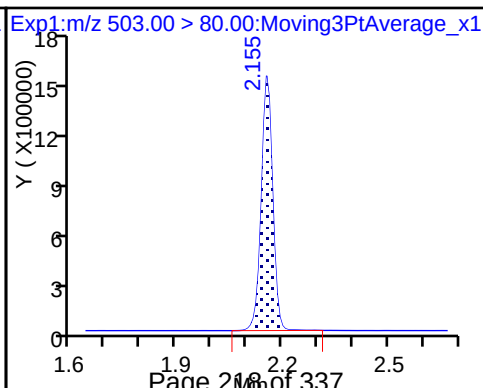
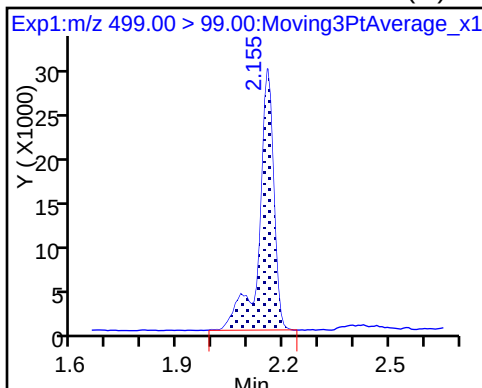
8 Perfluorooctane sulfonic acid (M)



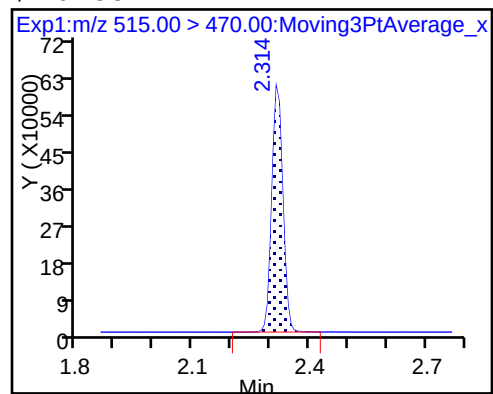
8 Perfluorooctane sulfonic acid (M)

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



## TestAmerica Sacramento

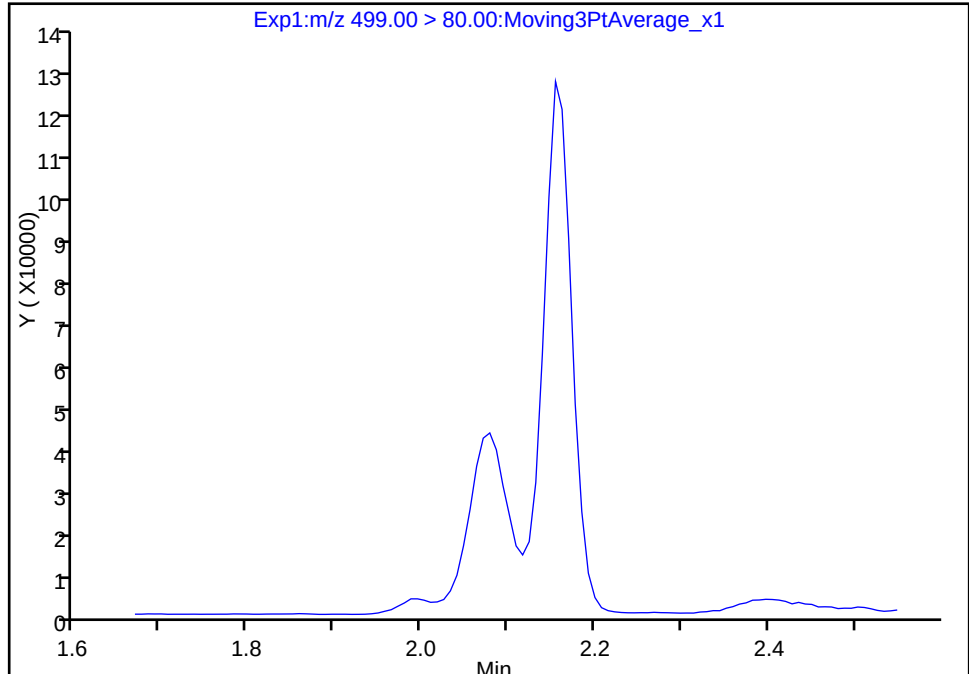
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Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8\_N  
Lims ID: IC L1  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

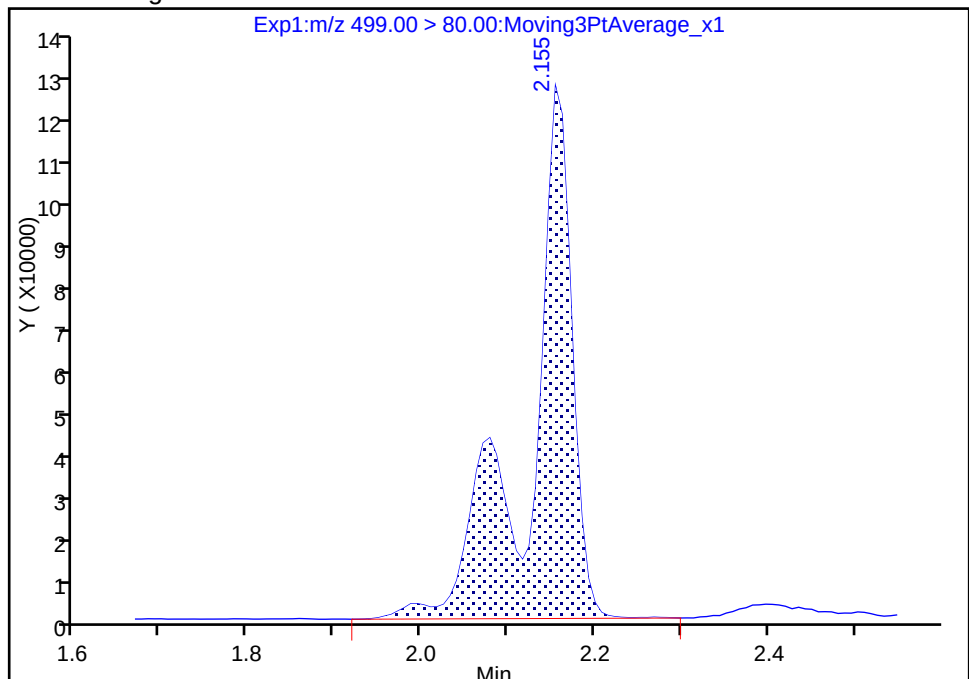
Not Detected  
Expected RT: 2.15

## Processing Integration Results



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

## Manual Integration Results



Reviewer: phomsophat, 06-Nov-2017 07:17:28

Audit Action: Assigned Compound ID

Audit Reason: Assign Peak

## TestAmerica Sacramento

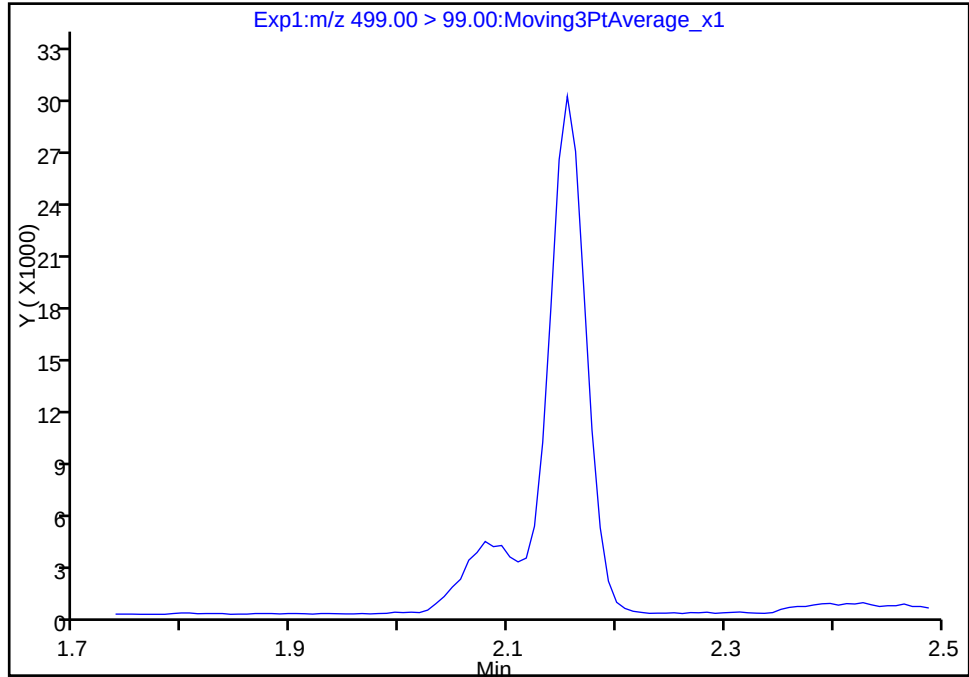
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_004.d  
Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8\_N  
Lims ID: IC L1  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 2

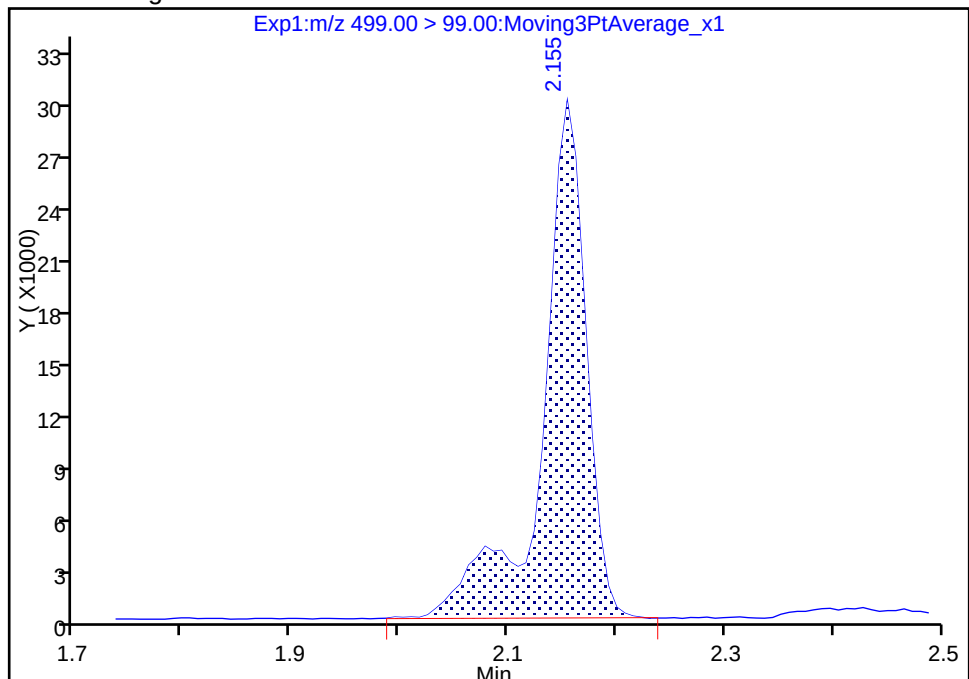
Not Detected  
Expected RT: 2.15

## Processing Integration Results



## Manual Integration Results

RT: 2.15  
Area: 85347  
Amount: 3.817687  
Amount Units: ng/ml



Reviewer: phomsophat, 06-Nov-2017 07:17:37

Audit Action: Manually Integrated

Audit Reason: Assign Peak

## TestAmerica Sacramento

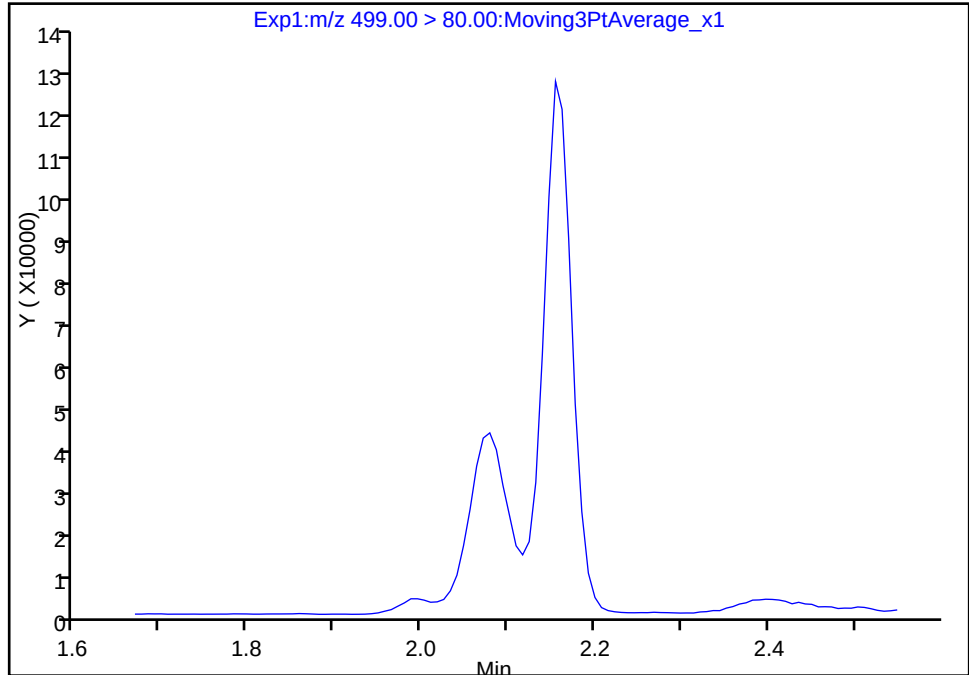
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_004.d  
Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8\_N  
Lims ID: IC L1  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

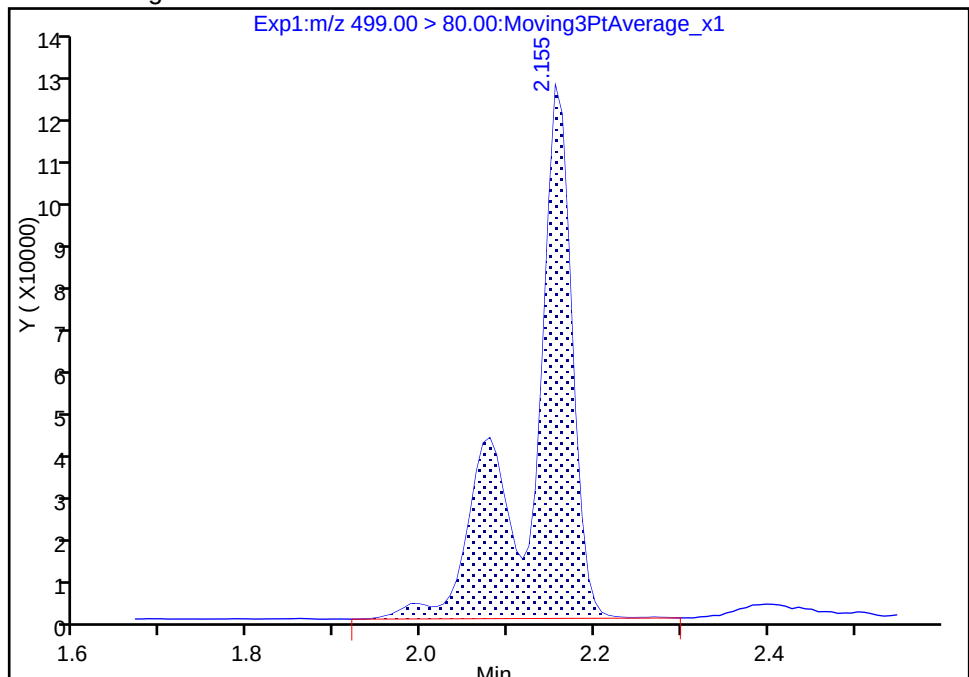
Not Detected  
Expected RT: 2.15

## Processing Integration Results



## Manual Integration Results

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



Reviewer: phomsophat, 06-Nov-2017 07:17:37

Audit Action: Manually Integrated

Audit Reason: Assign Peak



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_005.d  
 Lims ID: IC L2  
 Client ID:  
 Sample Type: IC Calib Level: 2  
 Inject. Date: 03-Nov-2017 13:42:39 ALS Bottle#: 2 Worklist Smp#: 5  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L2\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Nov-2017 15:52:08 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK021

First Level Reviewer: phomsophat

Date: 06-Nov-2017 07:18:56

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N  | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |      |       |
| 298.90 > 80.00                  | 1.449 | 1.444  | 0.005  | 1.000  | 2591121  | 19.8         |                 | 1479 |       |
| 298.90 > 99.00                  | 1.442 | 1.444  | -0.002 | 0.995  | 1874928  |              | 1.38(0.00-0.00) | 4315 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |      |       |
| 315.00 > 270.00                 | 1.578 | 1.573  | 0.005  | 1.000  | 1708988  | 9.57         |                 | 8562 |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |      |       |
| 363.00 > 319.00                 | 1.730 | 1.725  | 0.005  | 1.000  | 331548   | 2.18         |                 | 87.8 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |      |       |
| 399.00 > 80.00                  | 1.730 | 1.725  | 0.005  | 1.000  | 1312135  | 6.51         |                 | 2317 |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |      |       |
| 415.00 > 370.00                 | 1.920 | 1.913  | 0.007  |        | 1623614  | 10.0         |                 | 6970 |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |      |       |
| 413.00 > 369.00                 | 1.920 | 1.914  | 0.006  | 1.000  | 644149   | 4.29         |                 | 113  |       |
| 413.00 > 169.00                 | 1.920 | 1.914  | 0.006  | 1.000  | 329479   |              | 1.96(0.00-0.00) | 459  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |      |       |
| 499.00 > 80.00                  | 2.155 | 2.147  | 0.008  | 1.000  | 985487   | 8.72         |                 | 578  | M     |
| 499.00 > 99.00                  | 2.155 | 2.147  | 0.008  | 1.000  | 200739   |              | 4.91(0.00-0.00) | 449  | M     |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |      |       |
| 503.00 > 80.00                  | 2.155 | 2.151  | 0.004  |        | 3450592  | 28.7         |                 | 5334 |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |      |       |
| 463.00 > 419.00                 | 2.162 | 2.158  | 0.004  | 1.000  | 453612   | 4.21         |                 | 136  |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |      |       |
| 515.00 > 470.00                 | 2.314 | 2.312  | 0.002  | 1.000  | 1184358  | 9.53         |                 | 7573 |       |

## QC Flag Legend

### Review Flags

M - Manually Integrated

### Reagents:

LC537-L2\_00020

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_005.d

Injection Date: 03-Nov-2017 13:42:39

Instrument ID: A8\_N

Lims ID: IC L2

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

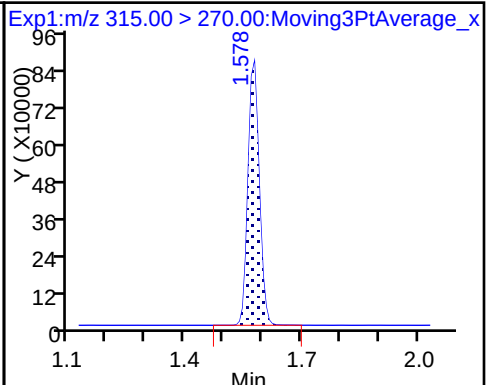
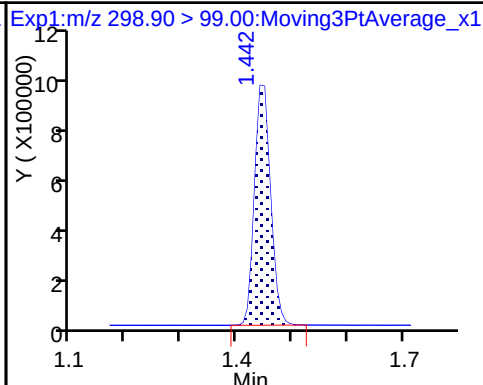
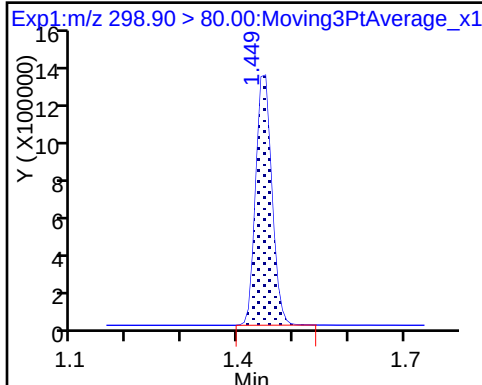
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

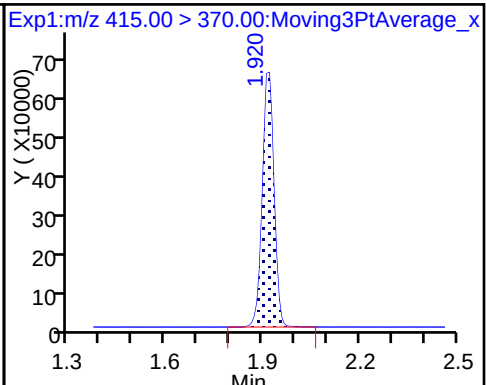
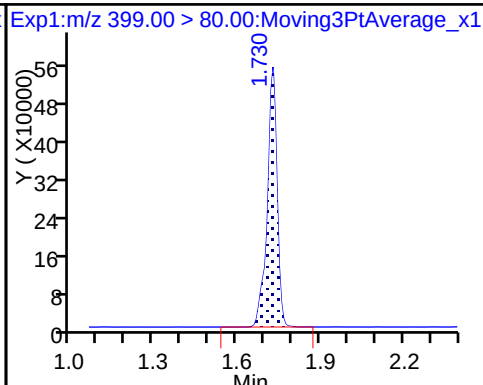
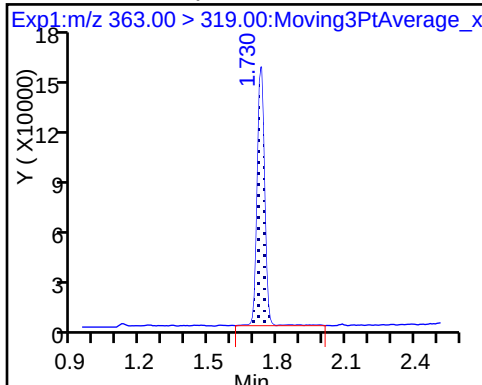
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

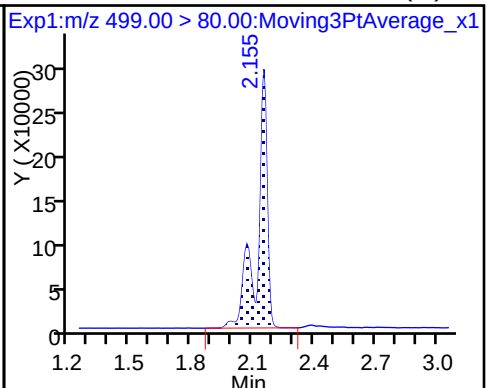
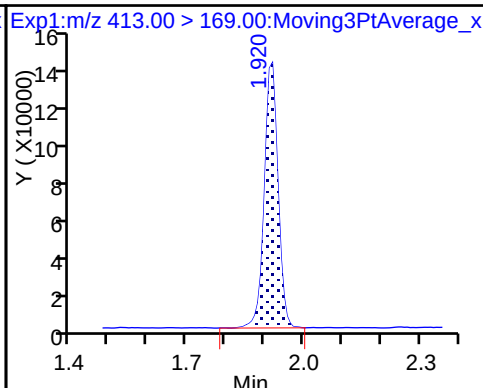
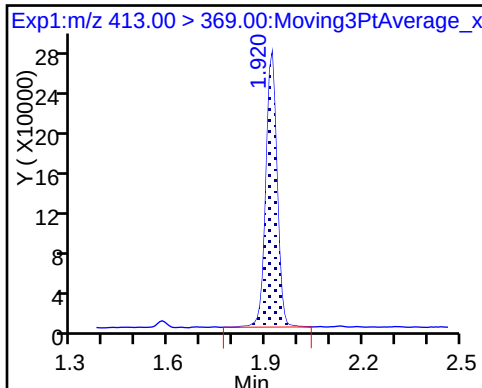
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

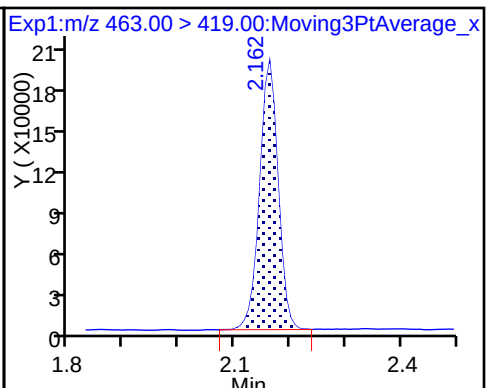
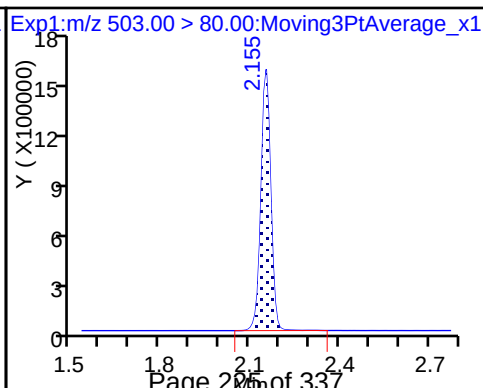
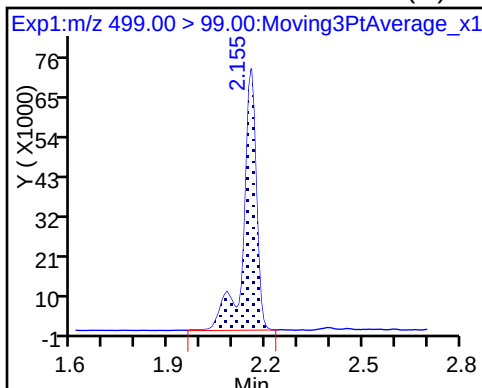
5 Perfluorooctanoic acid

8 Perfluorooctane sulfonic acid (M)

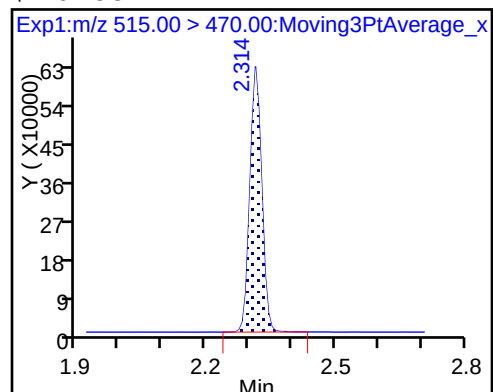


8 Perfluorooctane sulfonic acid (M) \* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



## TestAmerica Sacramento

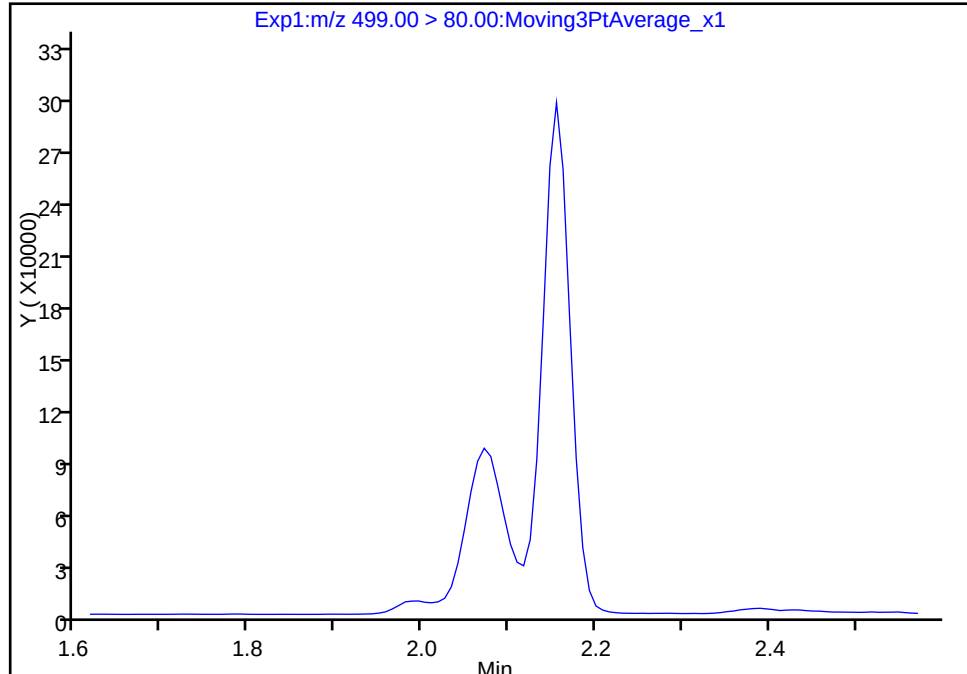
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_005.d  
Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8\_N  
Lims ID: IC L2  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

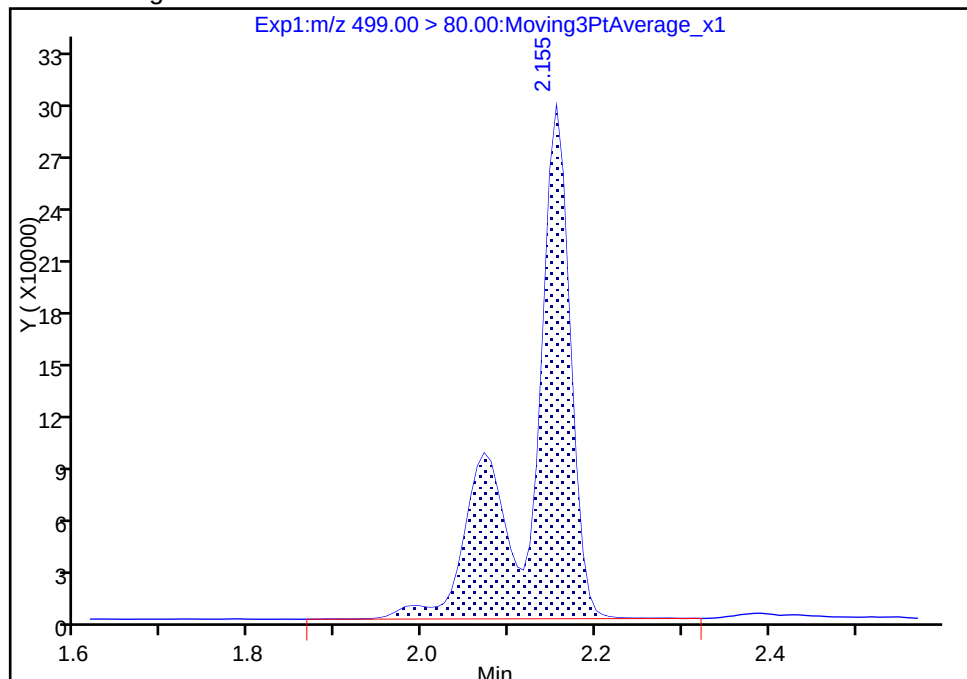
Not Detected  
Expected RT: 2.15

## Processing Integration Results



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

## Manual Integration Results



Reviewer: phomsophat, 06-Nov-2017 07:18:13

Audit Action: Assigned Compound ID

Audit Reason: Assign Peak

## TestAmerica Sacramento

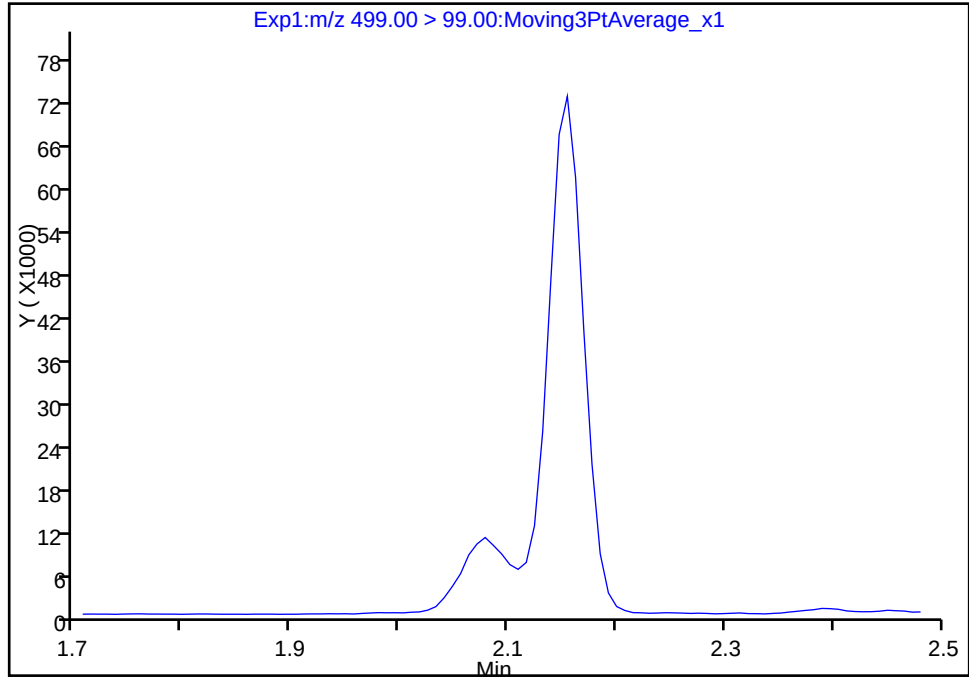
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_005.d  
Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8\_N  
Lims ID: IC L2  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 2

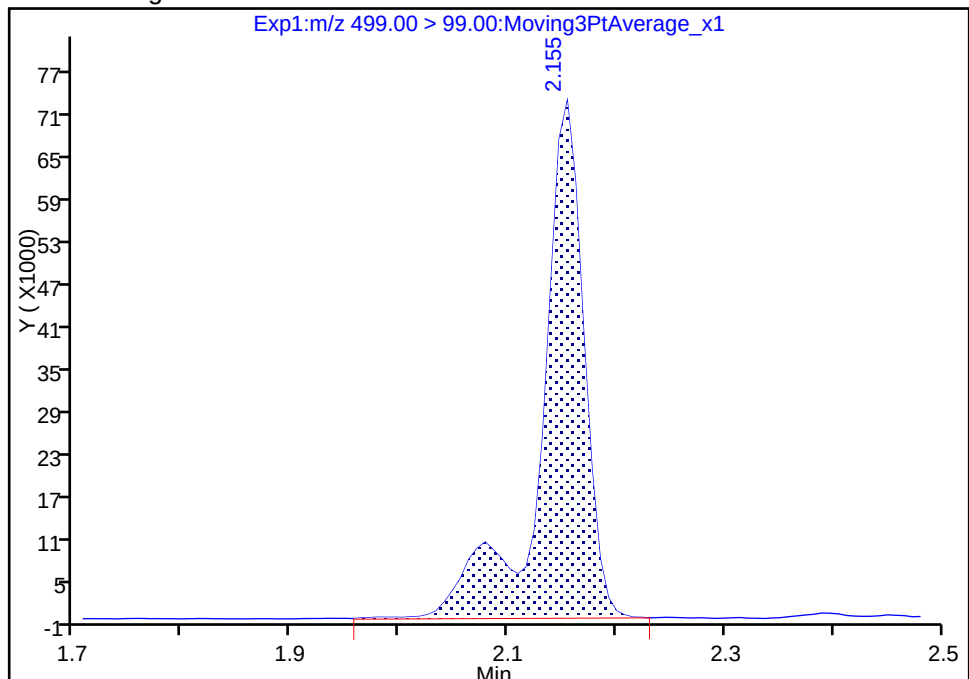
Not Detected  
Expected RT: 2.15

## Processing Integration Results



## Manual Integration Results

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



Reviewer: phomsophat, 06-Nov-2017 07:18:24

Audit Action: Manually Integrated

Audit Reason: Assign Peak

## TestAmerica Sacramento

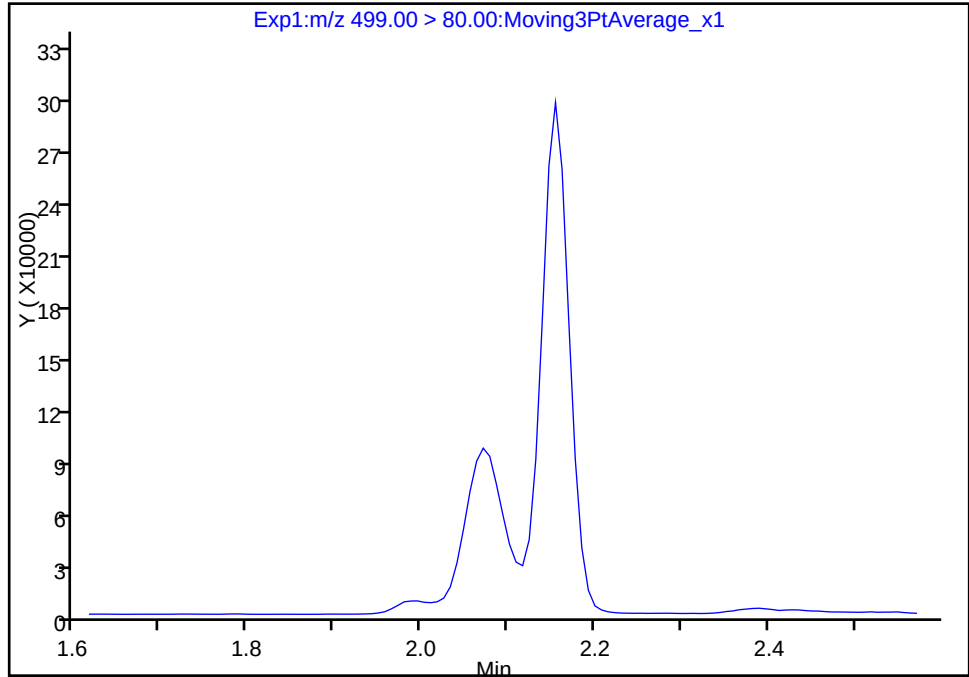
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_005.d  
Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8\_N  
Lims ID: IC L2  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

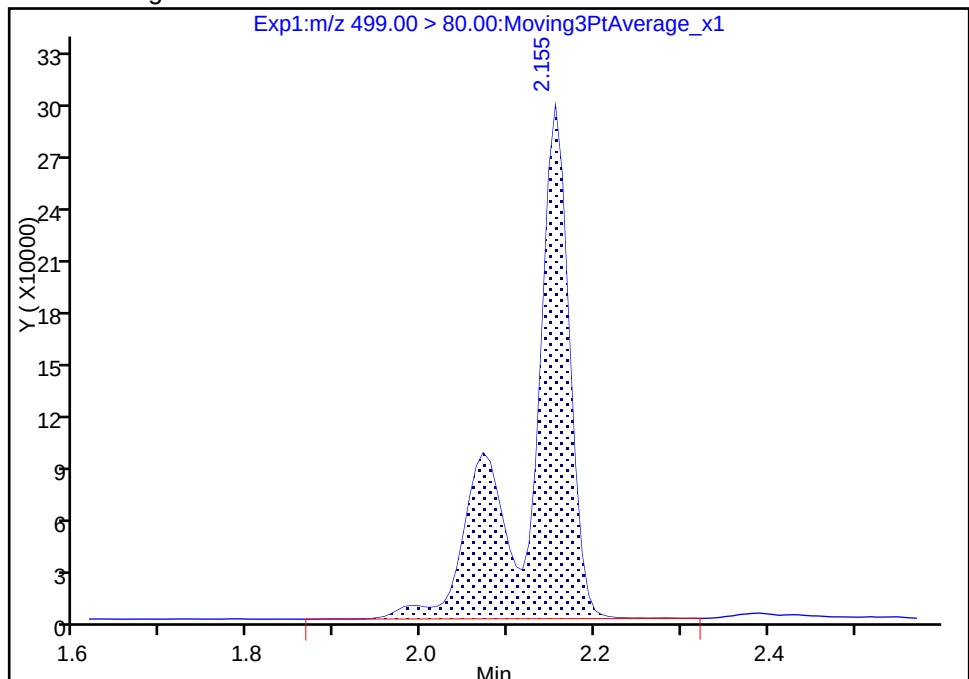
Not Detected  
Expected RT: 2.15

## Processing Integration Results



## Manual Integration Results

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



Reviewer: phomsophat, 06-Nov-2017 07:18:24

Audit Action: Manually Integrated

Audit Reason: Assign Peak

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_006.d  
 Lims ID: IC L3  
 Client ID:  
 Sample Type: IC Calib Level: 3  
 Inject. Date: 03-Nov-2017 13:47:20 ALS Bottle#: 3 Worklist Smp#: 6  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L3\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Nov-2017 15:52:09 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK021

First Level Reviewer: phomsophat

Date: 06-Nov-2017 07:20:04

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N  | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |      |       |
| 298.90 > 80.00                  | 1.442 | 1.444  | -0.002 | 1.000  | 5461974  | 46.7         |                 | 3220 |       |
| 298.90 > 99.00                  | 1.442 | 1.444  | -0.002 | 1.000  | 3903438  |              | 1.40(0.00-0.00) | 8589 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |      |       |
| 315.00 > 270.00                 | 1.571 | 1.573  | -0.003 | 1.000  | 1701491  | 10.0         |                 | 9021 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |      |       |
| 399.00 > 80.00                  | 1.722 | 1.725  | -0.003 | 1.000  | 2908204  | 15.6         |                 | 5000 |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |      |       |
| 363.00 > 319.00                 | 1.722 | 1.725  | -0.003 | 1.000  | 736034   | 5.10         |                 | 208  |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |      |       |
| 415.00 > 370.00                 | 1.912 | 1.913  | -0.001 |        | 1540946  | 10.0         |                 | 6787 |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |      |       |
| 413.00 > 369.00                 | 1.912 | 1.914  | -0.002 | 1.000  | 1388033  | 9.73         |                 | 256  |       |
| 413.00 > 169.00                 | 1.912 | 1.914  | -0.002 | 1.000  | 715399   |              | 1.94(0.00-0.00) | 904  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |      |       |
| 499.00 > 80.00                  | 2.147 | 2.147  | 0.0    | 1.000  | 2067792  | 19.8         |                 | 2001 |       |
| 499.00 > 99.00                  | 2.147 | 2.147  | 0.0    | 1.000  | 431075   |              | 4.80(0.00-0.00) | 922  |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |      |       |
| 503.00 > 80.00                  | 2.147 | 2.151  | -0.004 |        | 3194016  | 28.7         |                 | 4956 |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |      |       |
| 463.00 > 419.00                 | 2.155 | 2.158  | -0.003 | 1.000  | 1020851  | 9.97         |                 | 302  |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |      |       |
| 515.00 > 470.00                 | 2.306 | 2.312  | -0.006 | 1.000  | 1166275  | 9.89         |                 | 6310 |       |



**Reagents:**

LC537-L3\_00023

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_006.d

Injection Date: 03-Nov-2017 13:47:20

Instrument ID: A8\_N

Lims ID: IC L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

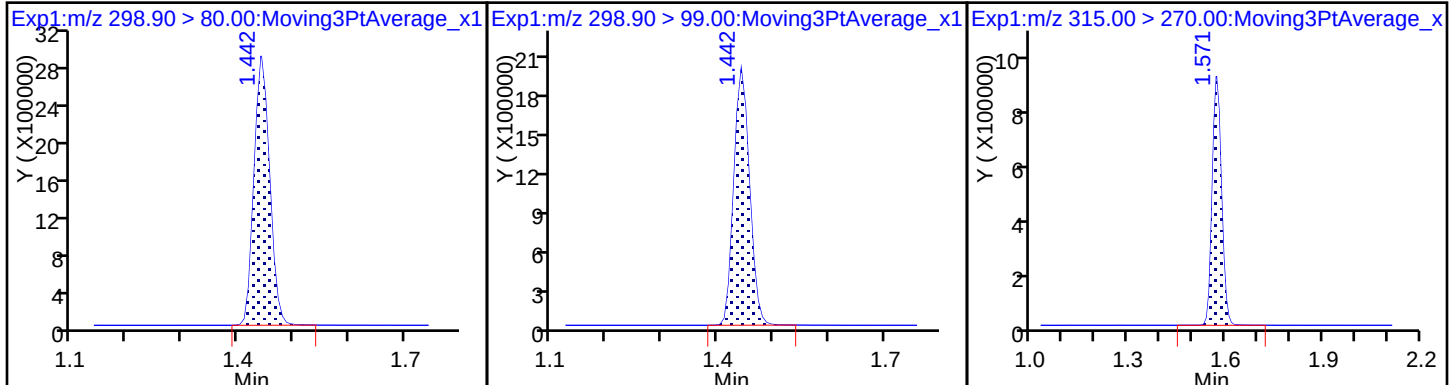
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

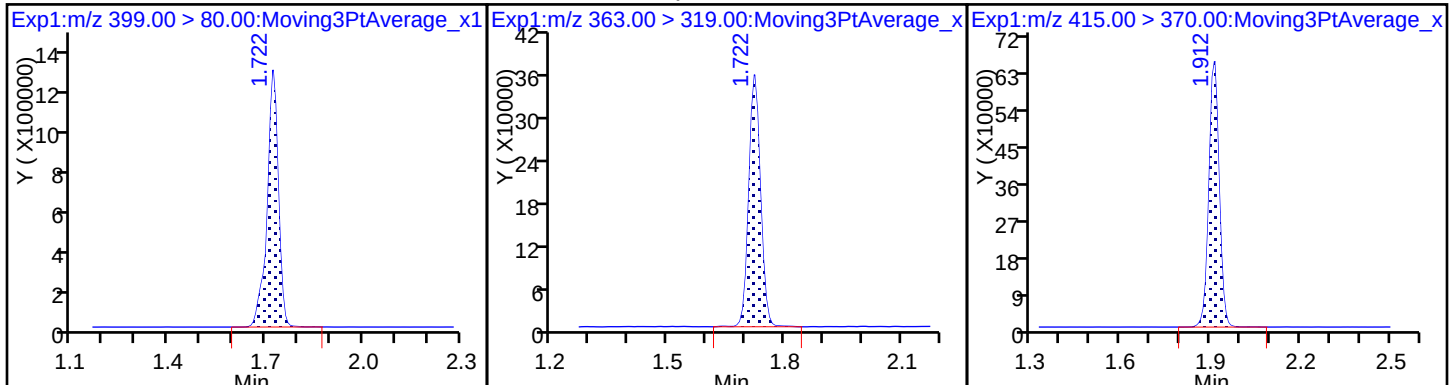
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

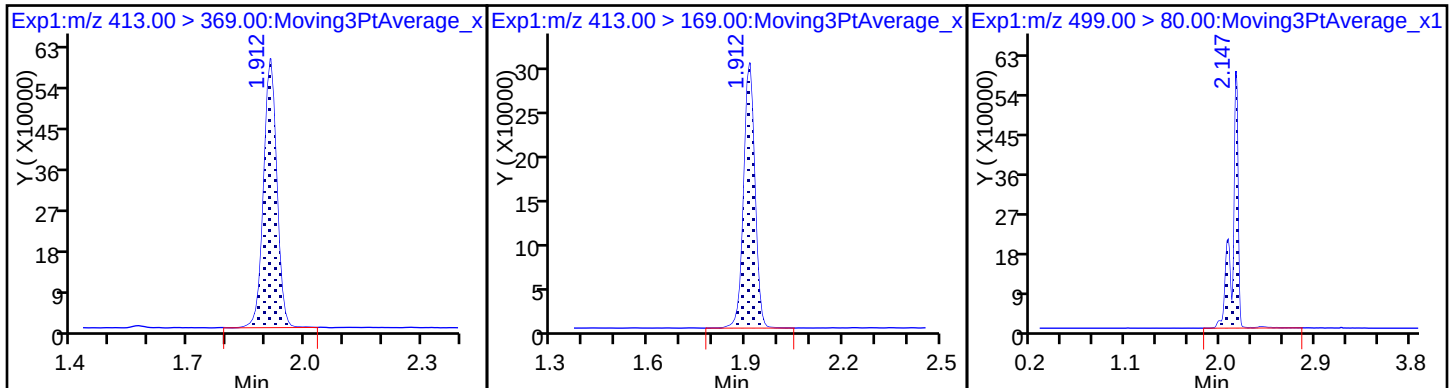
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

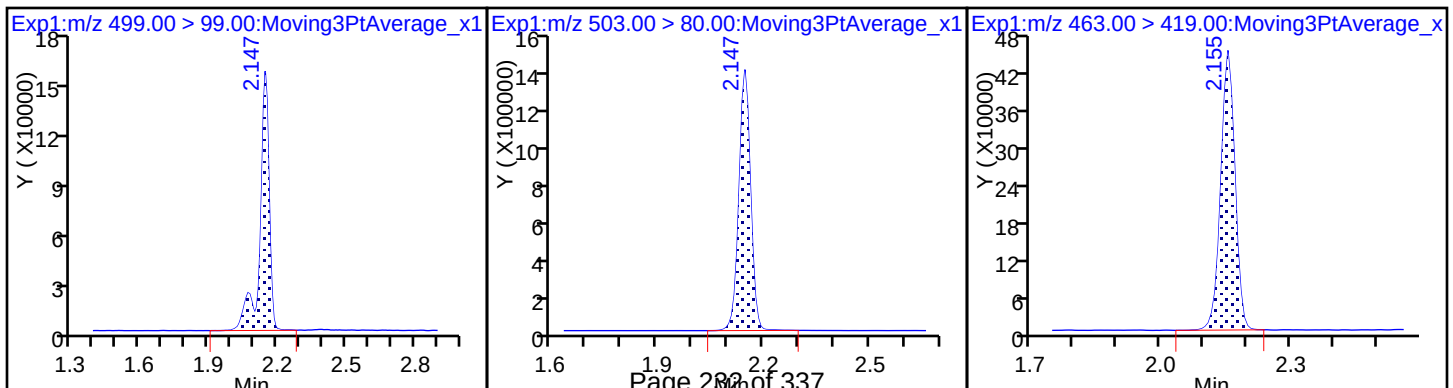
8 Perfluorooctane sulfonic acid



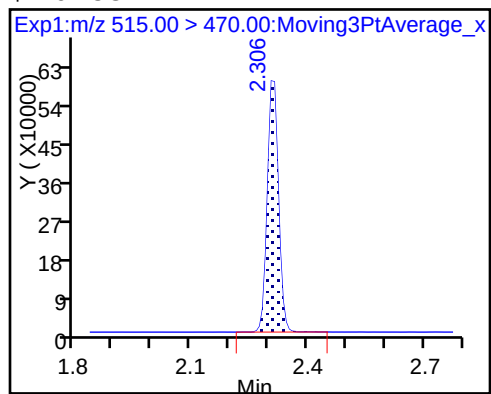
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_007.d  
 Lims ID: IC L4  
 Client ID:  
 Sample Type: ICISAV Calib Level: 4  
 Inject. Date: 03-Nov-2017 13:52:00 ALS Bottle#: 4 Worklist Smp#: 7  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L4\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Nov-2017 15:52:10 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK021

First Level Reviewer: phomsophat

Date: 06-Nov-2017 07:20:46

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.442 | 1.444  | -0.002 | 1.000  | 10142530 | 87.2         |                 | 5274  |       |
| 298.90 > 99.00                  | 1.442 | 1.444  | -0.002 | 1.000  | 7408390  |              | 1.37(0.00-0.00) | 12862 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.571 | 1.573  | -0.003 | 1.000  | 1719911  | 10.1         |                 | 8503  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.722 | 1.725  | -0.003 | 1.000  | 1420703  | 9.81         |                 | 399   |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.722 | 1.725  | -0.003 | 1.000  | 5871843  | 29.8         |                 | 7622  |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.912 | 1.913  | -0.001 |        | 1546307  | 10.0         |                 | 6563  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.912 | 1.914  | -0.002 | 1.000  | 2771271  | 19.4         |                 | 505   |       |
| 413.00 > 169.00                 | 1.912 | 1.914  | -0.002 | 1.000  | 1520933  |              | 1.82(0.00-0.00) | 1919  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 2.155 | 2.147  | 0.008  | 1.000  | 4363079  | 39.5         |                 | 3896  | M     |
| 499.00 > 99.00                  | 2.155 | 2.147  | 0.008  | 1.000  | 902486   |              | 4.83(0.00-0.00) | 1588  | M     |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 2.155 | 2.151  | 0.004  |        | 3374600  | 28.7         |                 | 5331  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 2.162 | 2.158  | 0.004  | 1.000  | 2106479  | 20.5         |                 | 638   |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.314 | 2.312  | 0.002  | 1.000  | 1207887  | 10.2         |                 | 7165  |       |

## QC Flag Legend

### Review Flags

M - Manually Integrated

## Reagents:

LC537-L4\_00020

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_007.d

Injection Date: 03-Nov-2017 13:52:00

Instrument ID: A8\_N

Lims ID: IC L4

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 4

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

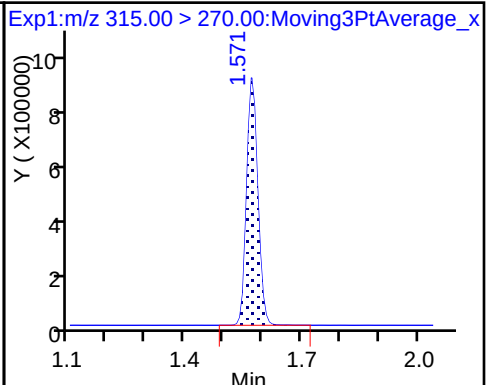
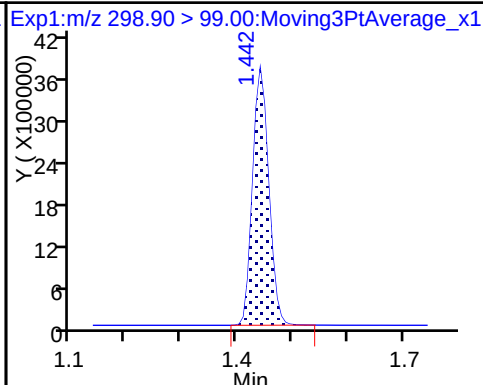
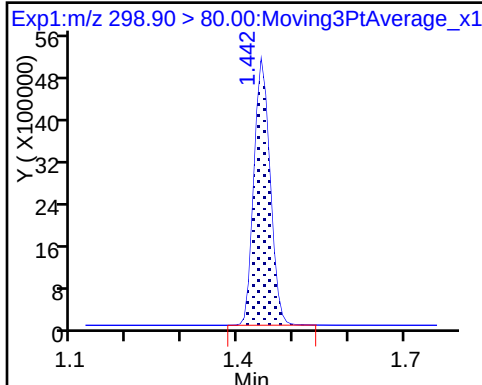
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

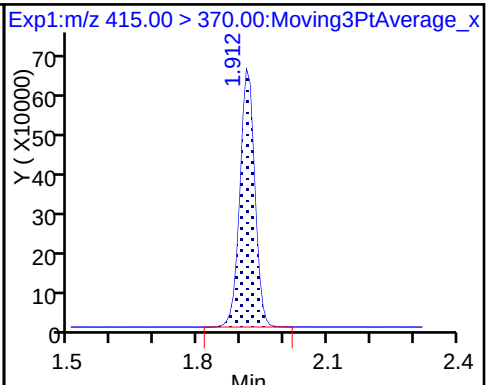
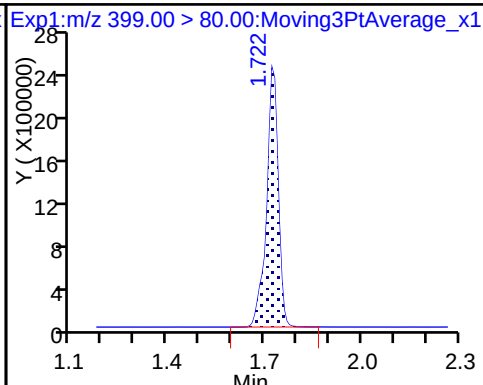
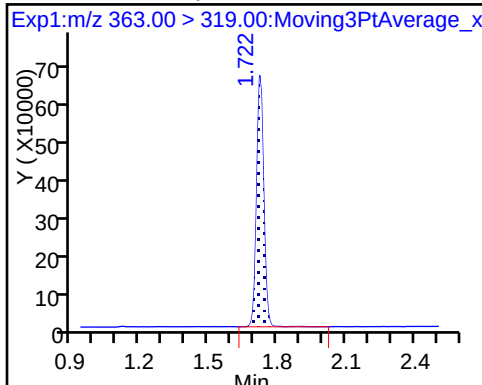
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

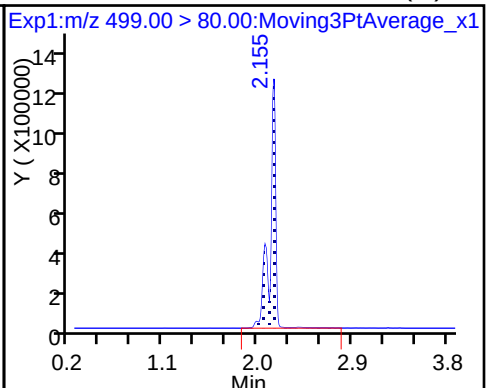
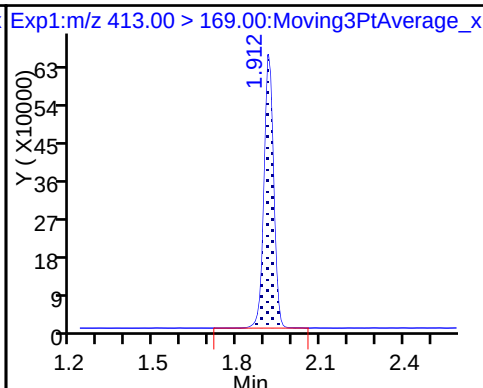
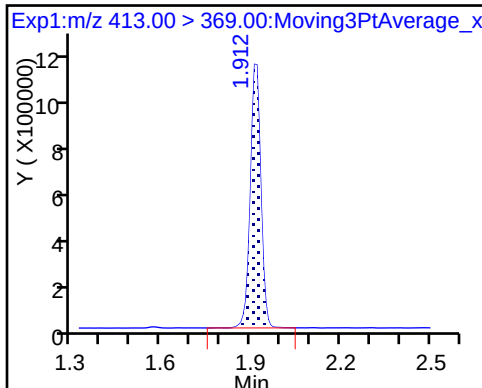
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

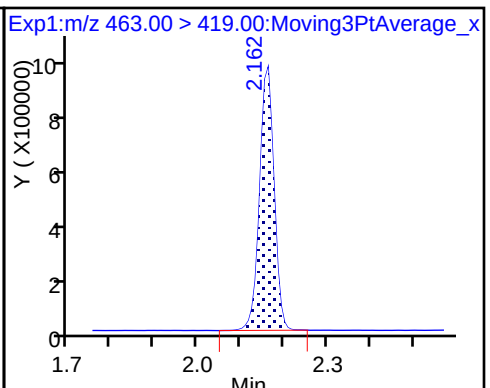
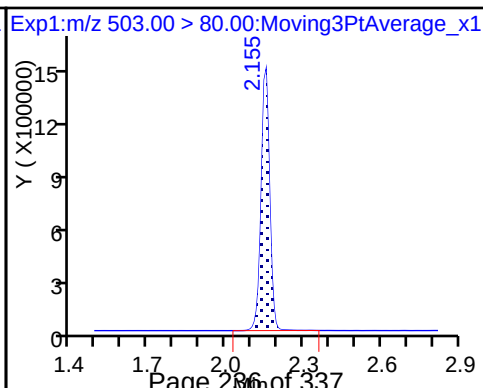
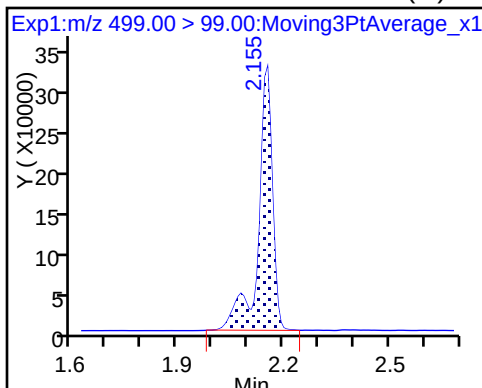
8 Perfluorooctane sulfonic acid (M)



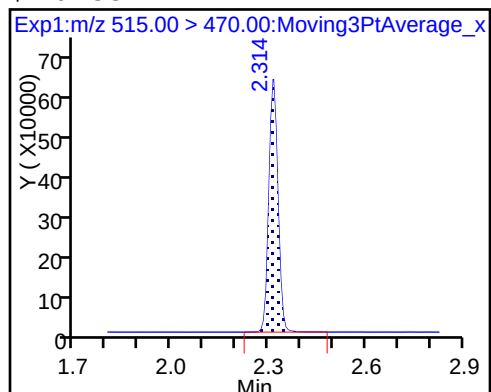
8 Perfluorooctane sulfonic acid (M)

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



## TestAmerica Sacramento

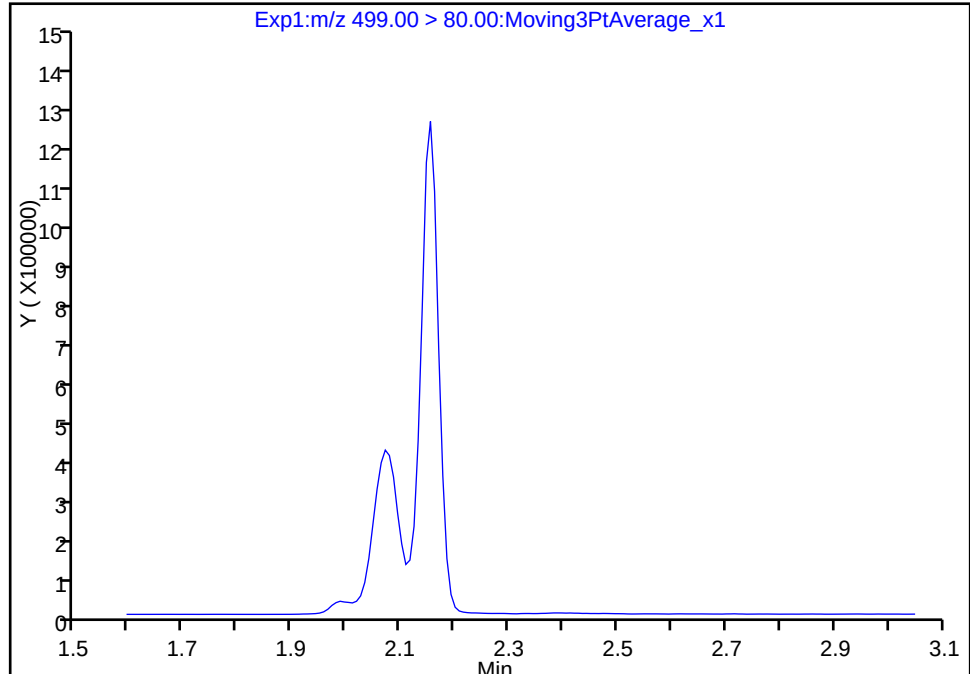
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_007.d  
Injection Date: 03-Nov-2017 13:52:00 Instrument ID: A8\_N  
Lims ID: IC L4  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

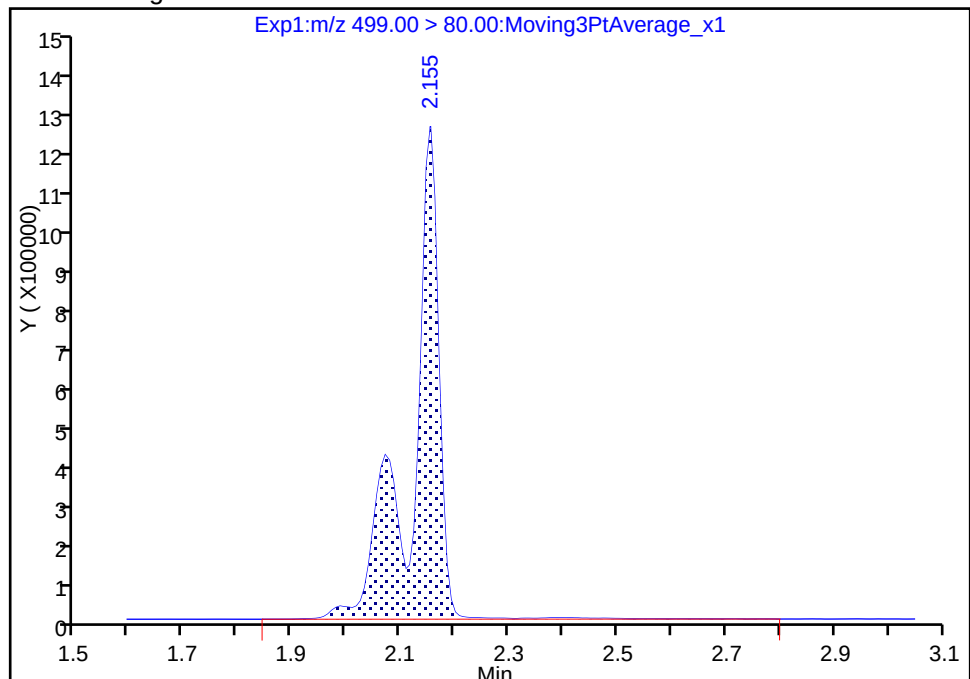
Not Detected  
Expected RT: 2.15

## Processing Integration Results



RT: 2.15  
Area: 4363079  
Amount: 39.491903  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: phomsophat, 06-Nov-2017 07:20:12

Audit Action: Assigned Compound ID

Audit Reason: Assign Peak



## TestAmerica Sacramento

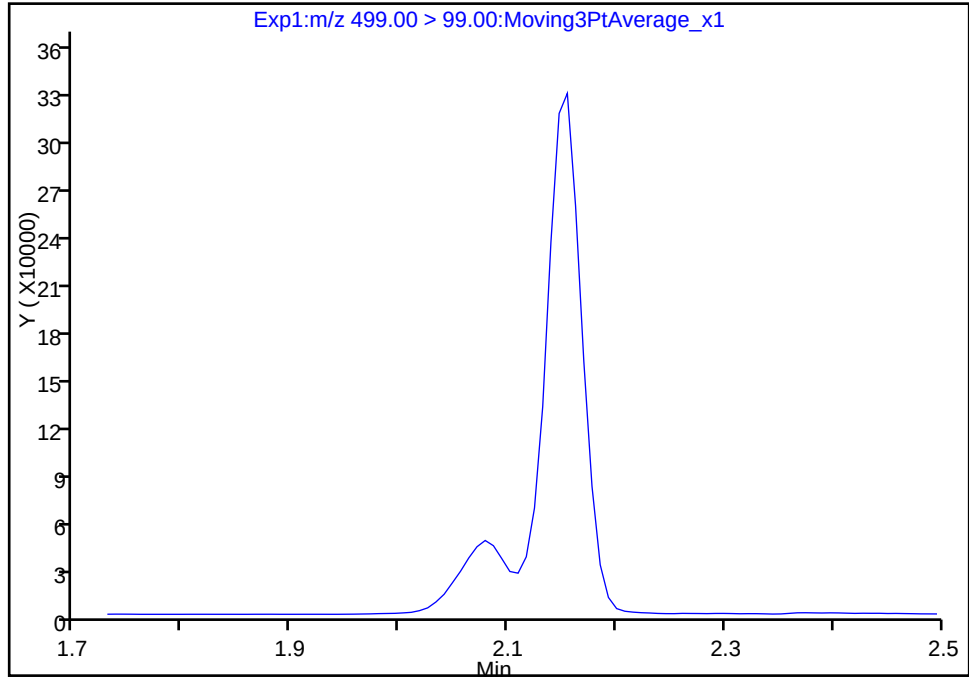
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_007.d  
Injection Date: 03-Nov-2017 13:52:00 Instrument ID: A8\_N  
Lims ID: IC L4  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 2

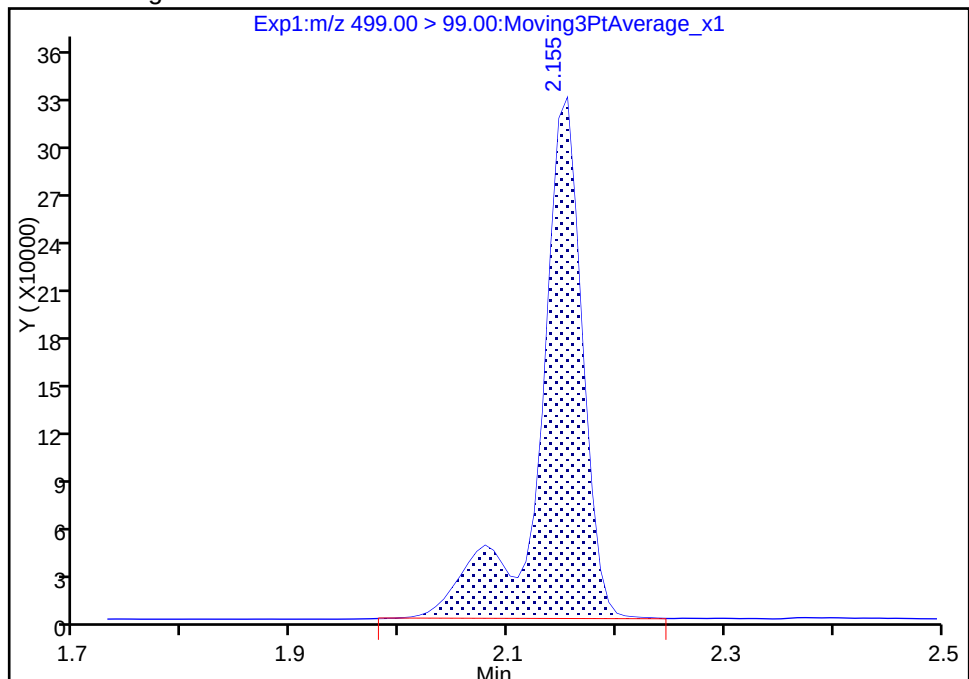
Not Detected  
Expected RT: 2.15

## Processing Integration Results



## Manual Integration Results

RT: 2.15  
Area: 902486  
Amount: 39.491903  
Amount Units: ng/ml



Reviewer: phomsophat, 06-Nov-2017 07:20:20

Audit Action: Manually Integrated

Audit Reason: Assign Peak

## TestAmerica Sacramento

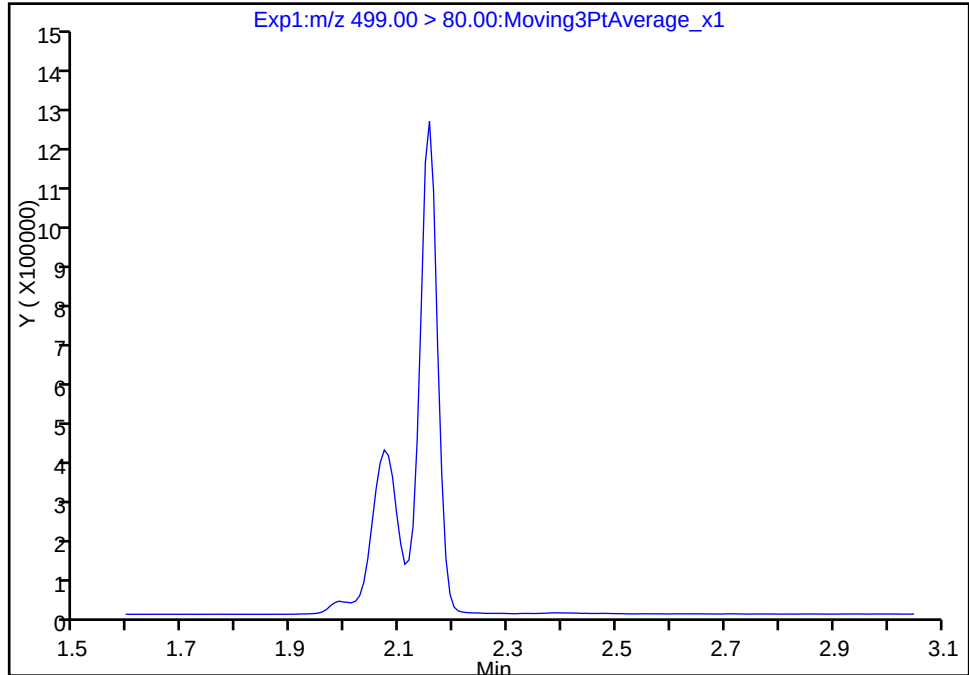
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_007.d  
Injection Date: 03-Nov-2017 13:52:00 Instrument ID: A8\_N  
Lims ID: IC L4  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

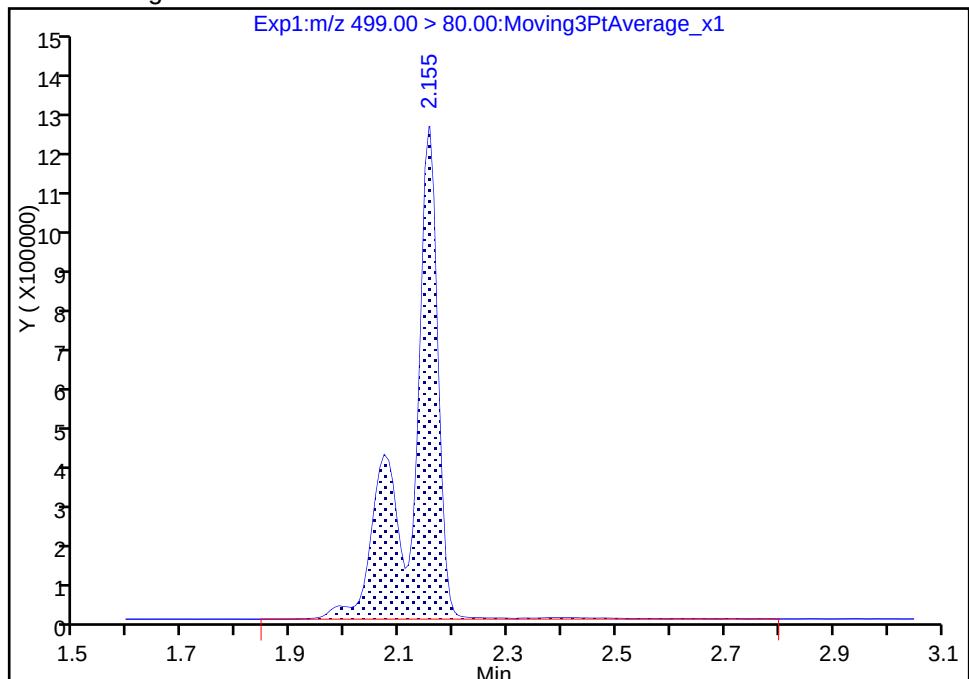
Not Detected  
Expected RT: 2.15

## Processing Integration Results



## Manual Integration Results

RT: 2.15  
Area: 4363079  
Amount: 39.491903  
Amount Units: ng/ml



Reviewer: phomsophat, 06-Nov-2017 07:20:20

Audit Action: Manually Integrated

Audit Reason: Assign Peak

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_008.d  
 Lims ID: IC L5  
 Client ID:  
 Sample Type: IC Calib Level: 5  
 Inject. Date: 03-Nov-2017 13:56:41 ALS Bottle#: 5 Worklist Smp#: 8  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L5\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Nov-2017 15:52:11 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK021

First Level Reviewer: phomsophat

Date: 06-Nov-2017 07:21:19

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.442 | 1.444  | -0.002 | 1.000  | 14011858 | 137.5        |                 | 6452  |       |
| 298.90 > 99.00                  | 1.442 | 1.444  | -0.002 | 1.000  | 10411479 |              | 1.35(0.00-0.00) | 14800 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.571 | 1.573  | -0.003 | 1.000  | 1675220  | 9.79         |                 | 9525  |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.722 | 1.725  | -0.003 | 1.000  | 8413133  | 45.0         |                 | 9078  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.722 | 1.725  | -0.003 | 1.000  | 2102676  | 14.4         |                 | 562   |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.912 | 1.913  | -0.001 |        | 1555174  | 10.0         |                 | 6769  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.912 | 1.914  | -0.002 | 1.000  | 4257225  | 29.6         |                 | 800   |       |
| 413.00 > 169.00                 | 1.912 | 1.914  | -0.002 | 1.000  | 2294552  |              | 1.86(0.00-0.00) | 2838  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 2.147 | 2.147  | 0.0    | 1.000  | 6504279  | 62.1         |                 | 5682  |       |
| 499.00 > 99.00                  | 2.147 | 2.147  | 0.0    | 1.000  | 1339120  |              | 4.86(0.00-0.00) | 2329  |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 2.147 | 2.151  | -0.004 |        | 3199479  | 28.7         |                 | 4946  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 2.155 | 2.158  | -0.003 | 1.000  | 3023088  | 29.3         |                 | 870   |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.314 | 2.312  | 0.002  | 1.000  | 1139992  | 9.58         |                 | 5885  |       |

**Reagents:**

LC537-L5\_00024

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_008.d

Injection Date: 03-Nov-2017 13:56:41

Instrument ID: A8\_N

Lims ID: IC L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

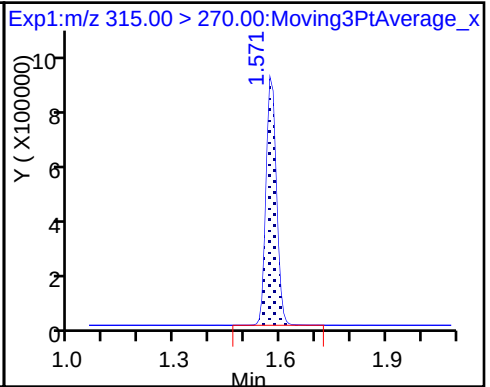
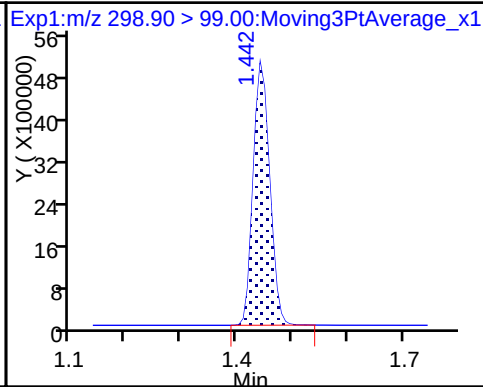
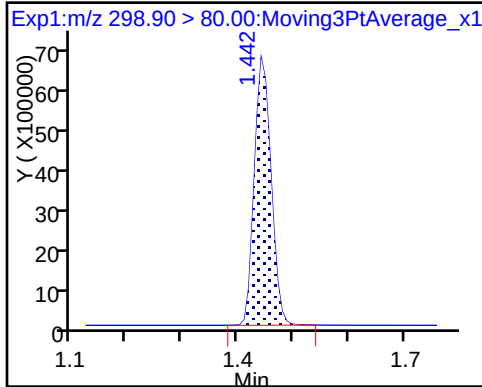
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

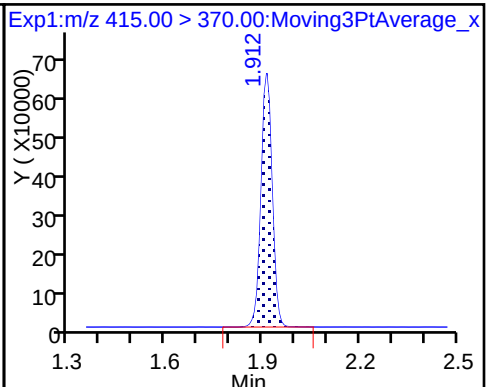
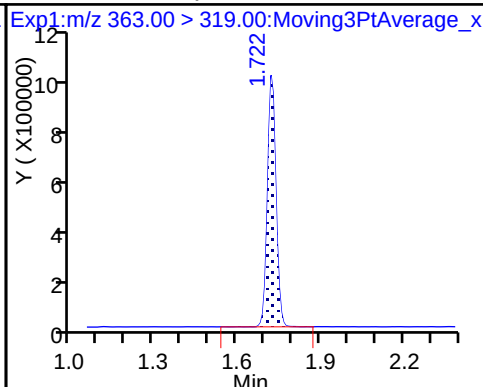
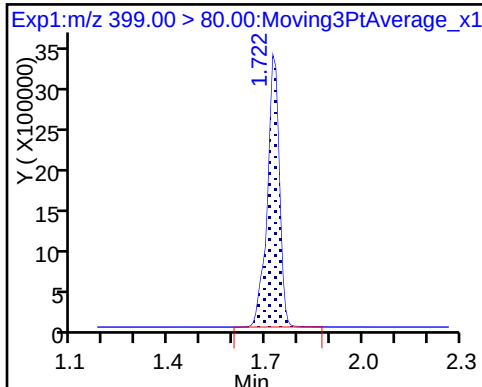
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

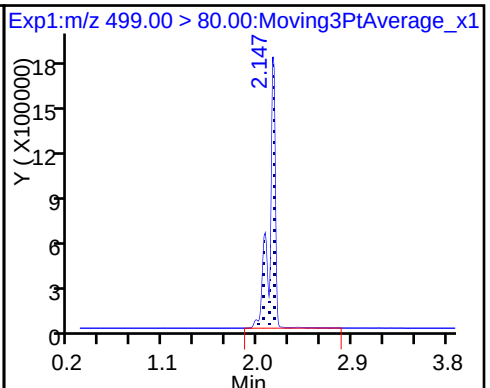
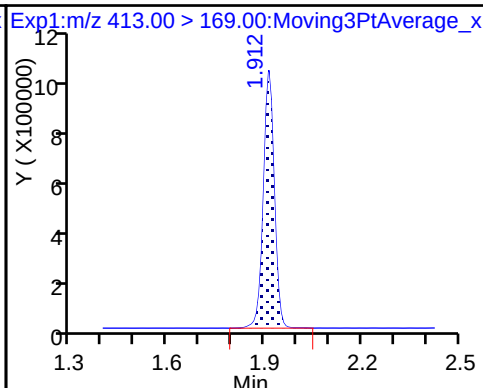
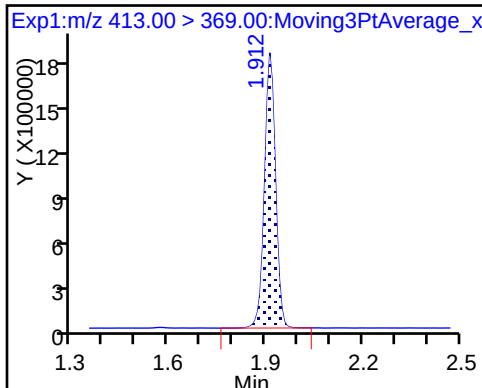
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

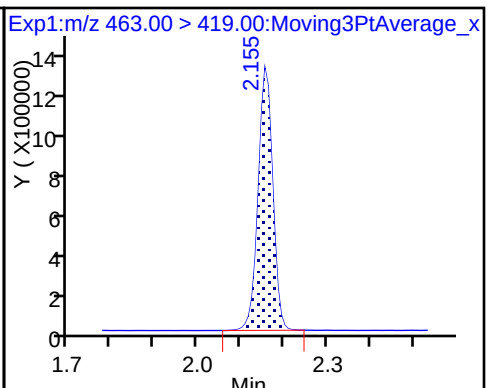
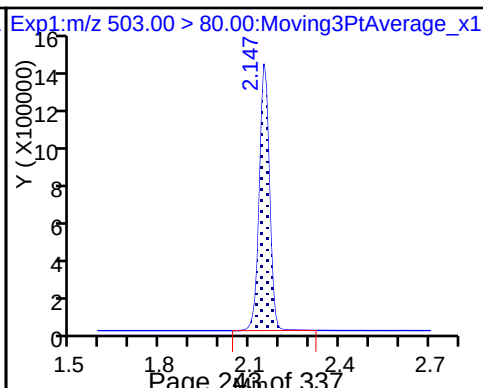
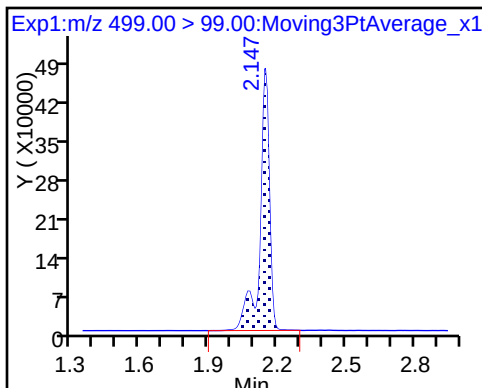
8 Perfluorooctane sulfonic acid



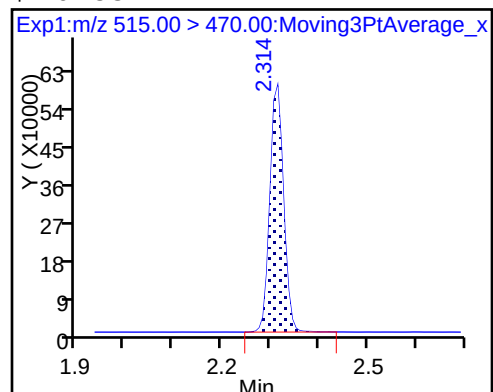
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
 Lims ID: IC L6  
 Client ID:  
 Sample Type: IC Calib Level: 6  
 Inject. Date: 03-Nov-2017 14:01:24 ALS Bottle#: 6 Worklist Smp#: 9  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L6\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Nov-2017 15:52:12 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK021

First Level Reviewer: phomsophat

Date: 06-Nov-2017 07:25:41

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.442 | 1.444  | -0.002 | 1.000  | 16699152 | 179.1        |                 | 7089  |       |
| 298.90 > 99.00                  | 1.442 | 1.444  | -0.002 | 1.000  | 12929978 |              | 1.29(0.00-0.00) | 15608 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.571 | 1.573  | -0.003 | 1.000  | 1664260  | 10.6         |                 | 9116  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.722 | 1.725  | -0.003 | 1.000  | 2810797  | 21.0         |                 | 763   |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.722 | 1.725  | -0.003 | 1.000  | 11071993 | 60.4         |                 | 10884 |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.904 | 1.913  | -0.009 |        | 1426806  | 10.0         |                 | 5446  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.912 | 1.914  | -0.002 | 1.000  | 5597122  | 42.4         |                 | 962   |       |
| 413.00 > 169.00                 | 1.904 | 1.914  | -0.010 | 0.996  | 3028676  |              | 1.85(0.00-0.00) | 3704  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 2.147 | 2.147  | 0.0    | 1.000  | 8679676  | 84.4         |                 | 6114  |       |
| 499.00 > 99.00                  | 2.147 | 2.147  | 0.0    | 1.000  | 1807143  |              | 4.80(0.00-0.00) | 2991  |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 2.147 | 2.151  | -0.004 |        | 3141787  | 28.7         |                 | 4961  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 2.155 | 2.158  | -0.003 | 1.000  | 4019666  | 42.4         |                 | 1149  |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.306 | 2.312  | -0.006 | 1.000  | 1164156  | 10.7         |                 | 6124  |       |

**Reagents:**

LC537-L6\_00020

Amount Added: 1.00

Units: mL



## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Injection Date: 03-Nov-2017 14:01:24

Instrument ID: A8\_N

Lims ID: IC L6

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 6

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

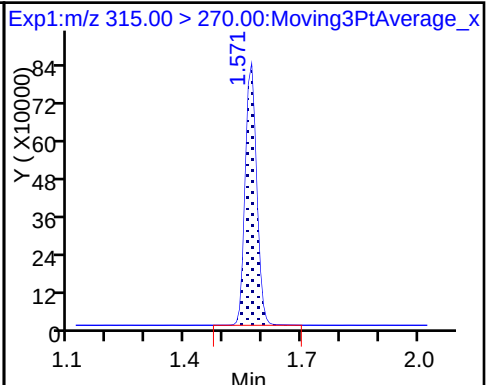
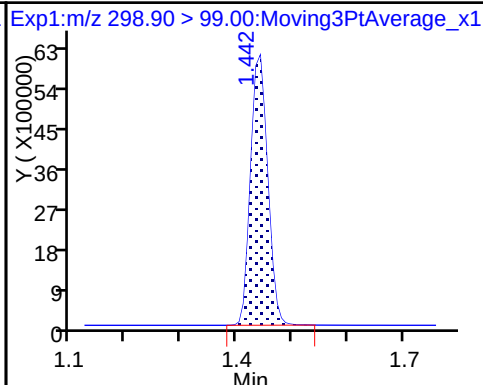
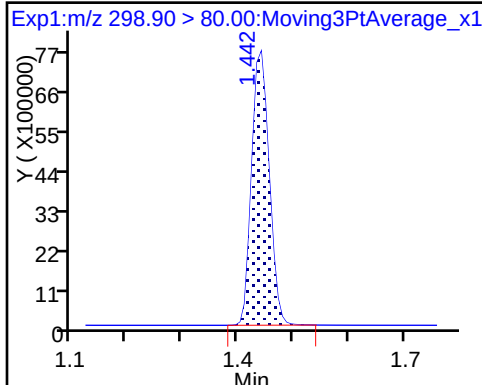
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

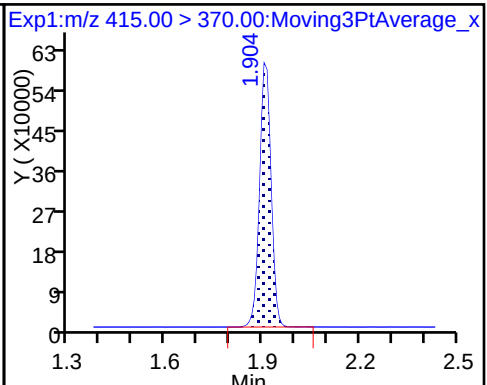
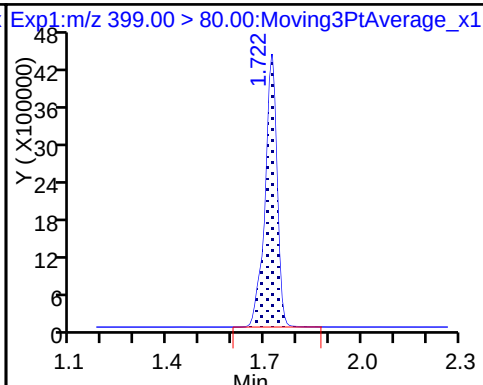
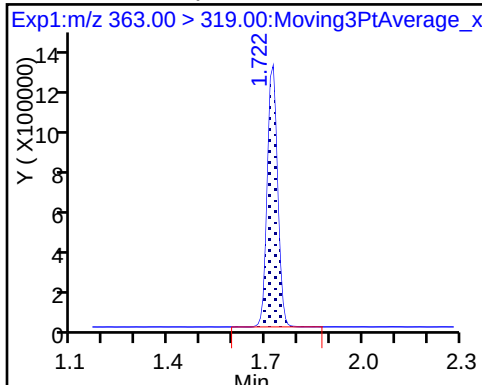
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

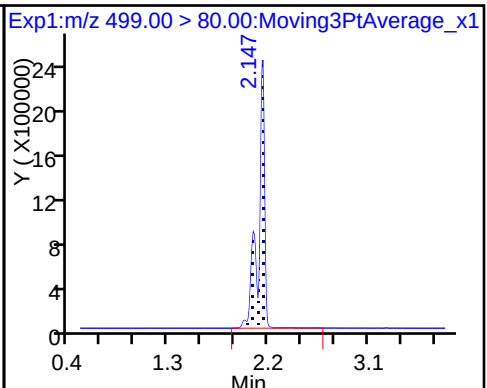
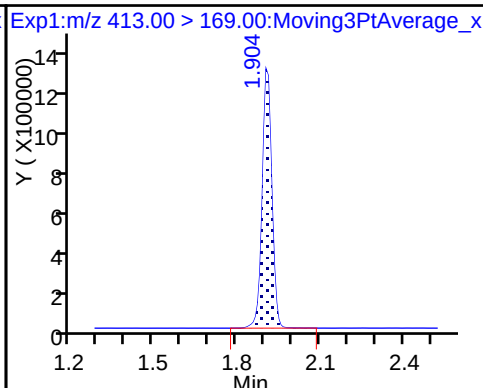
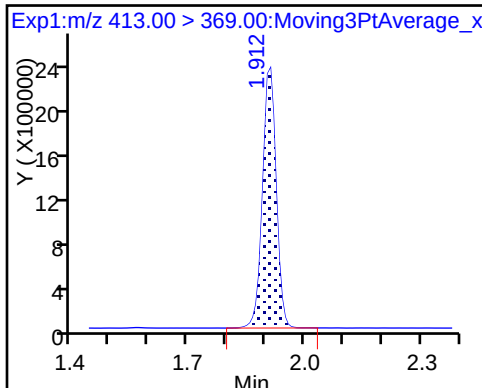
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

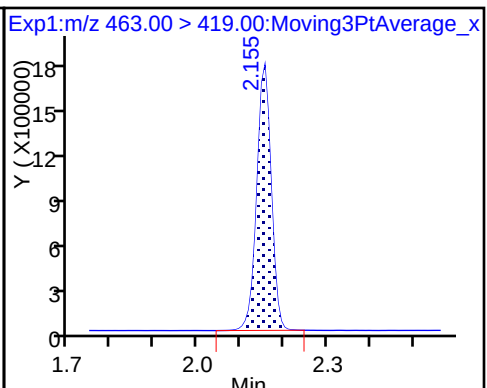
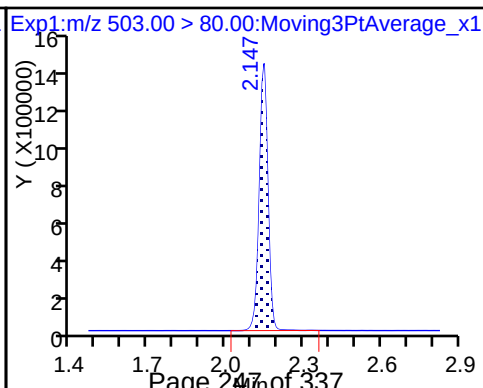
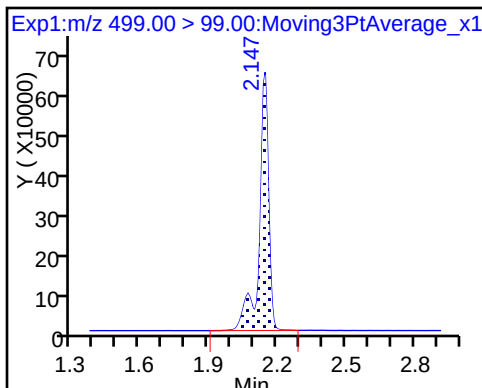
8 Perfluorooctane sulfonic acid



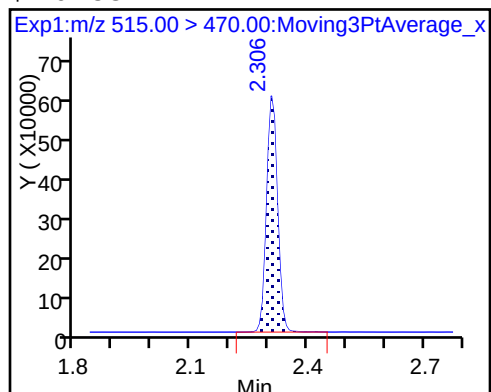
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-192908/11 Calibration Date: 11/03/2017 14:10  
 Instrument ID: A8\_N Calib Start Date: 11/03/2017 13:37  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01  
 Lab File ID: 2017.11.03\_537XICAL\_011.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | QuaF          |         | 1.109  |         | 20.4           | 20.0            | 1.9  | 50.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 0.9369  | 0.9382 |         | 2.23           | 2.22            | 0.1  | 50.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.674   | 1.688  |         | 6.72           | 6.67            | 0.8  | 50.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 0.9258  | 0.8825 |         | 4.24           | 4.45            | -4.7 | 50.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 0.9389  | 0.9176 |         | 8.69           | 8.89            | -2.3 | 50.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.6642  | 0.6625 |         | 4.43           | 4.45            | -0.2 | 50.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.068  |         | 9.70           | 10.0            | -3.0 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.7652  | 0.7460 |         | 9.75           | 10.0            | -2.5 | 30.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_011.d  
 Lims ID: CCVL  
 Client ID:  
 Sample Type: CCVL  
 Inject. Date: 03-Nov-2017 14:10:44 ALS Bottle#: 2 Worklist Smp#: 11  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L2  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Nov-2017 15:39:07 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK021

First Level Reviewer: phomsophat

Date: 06-Nov-2017 07:26:29

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N  | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |      |       |
| 298.90 > 80.00                  | 1.449 | 1.444  | 0.005  | 1.000  | 2556738  | 20.4         |                 | 1537 |       |
| 298.90 > 99.00                  | 1.449 | 1.444  | 0.005  | 1.000  | 1750170  |              | 1.46(0.00-0.00) | 4023 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |      |       |
| 315.00 > 270.00                 | 1.578 | 1.573  | 0.005  | 1.000  | 1694196  | 9.70         |                 | 8915 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |      |       |
| 399.00 > 80.00                  | 1.730 | 1.725  | 0.005  | 1.000  | 1297654  | 6.72         |                 | 2410 |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |      |       |
| 363.00 > 319.00                 | 1.730 | 1.725  | 0.005  | 1.000  | 330927   | 2.23         |                 | 99.4 |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |      |       |
| 415.00 > 370.00                 | 1.912 | 1.913  | -0.001 |        | 1586829  | 10.0         |                 | 6840 |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |      |       |
| 413.00 > 369.00                 | 1.912 | 1.914  | -0.002 | 1.000  | 622915   | 4.24         |                 | 116  |       |
| 413.00 > 169.00                 | 1.912 | 1.914  | -0.002 | 1.000  | 335080   |              | 1.86(0.00-0.00) | 460  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |      |       |
| 499.00 > 80.00                  | 2.155 | 2.147  | 0.008  | 1.000  | 940397   | 8.69         |                 | 528  |       |
| 499.00 > 99.00                  | 2.147 | 2.147  | 0.0    | 0.996  | 196397   |              | 4.79(0.00-0.00) | 430  |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |      |       |
| 503.00 > 80.00                  | 2.147 | 2.151  | -0.004 |        | 3305852  | 28.7         |                 | 5135 |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |      |       |
| 463.00 > 419.00                 | 2.162 | 2.158  | 0.004  | 1.000  | 467323   | 4.43         |                 | 143  |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |      |       |
| 515.00 > 470.00                 | 2.314 | 2.312  | 0.002  | 1.000  | 1183747  | 9.75         |                 | 6763 |       |

**Reagents:**

LC537-L2\_00020

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_011.d

Injection Date: 03-Nov-2017 14:10:44

Instrument ID: A8\_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

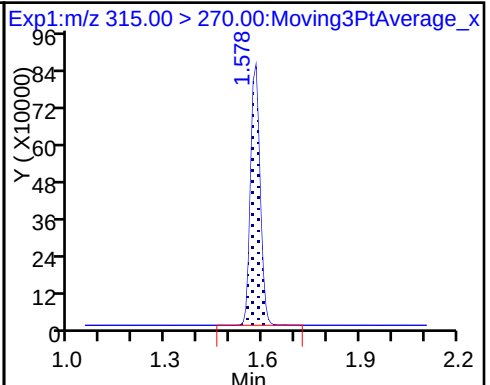
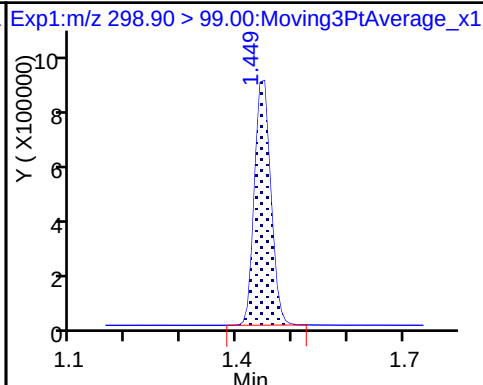
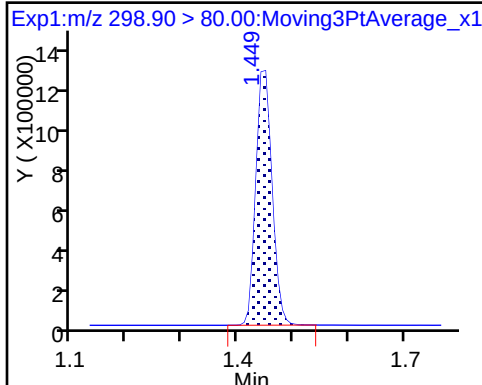
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

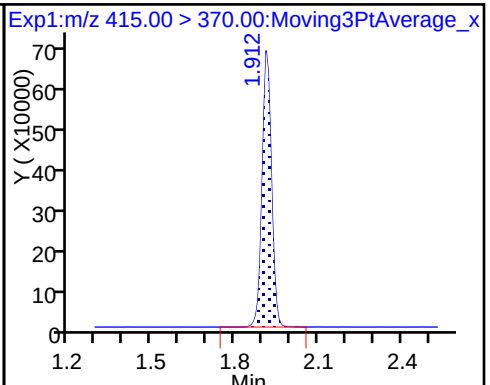
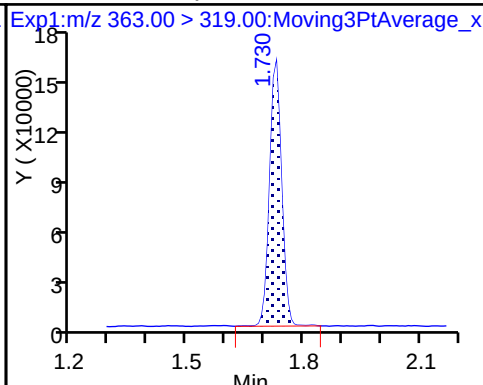
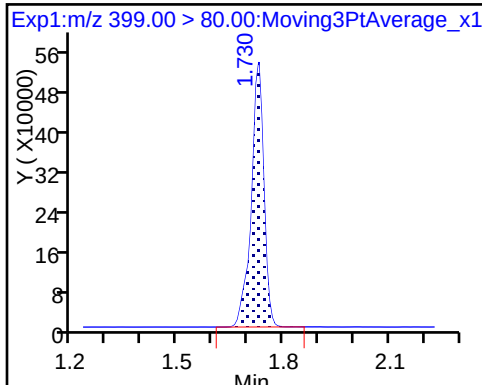
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

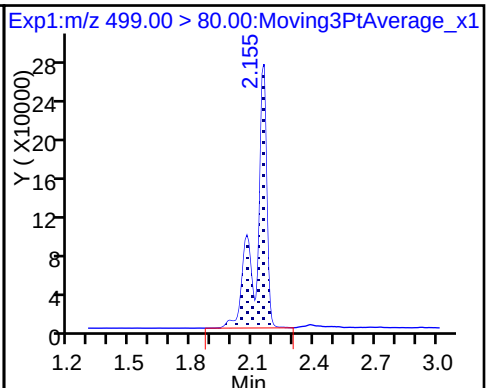
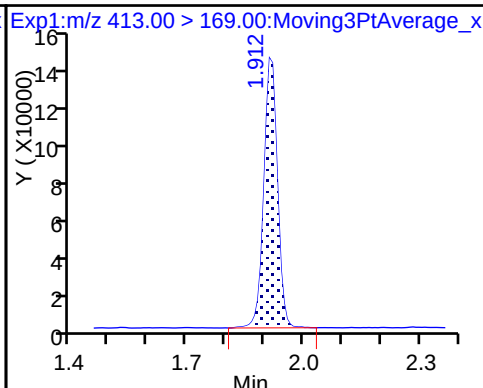
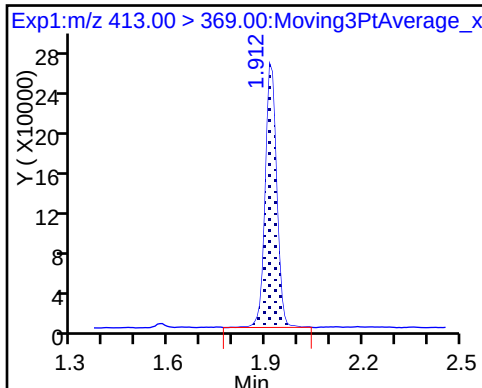
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

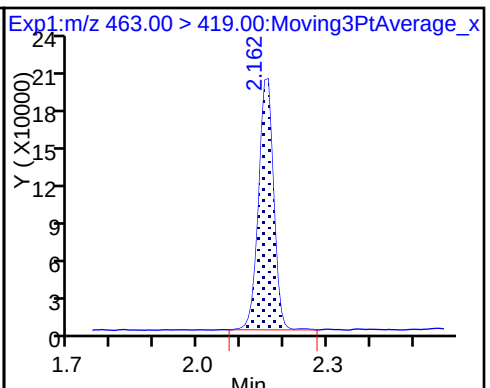
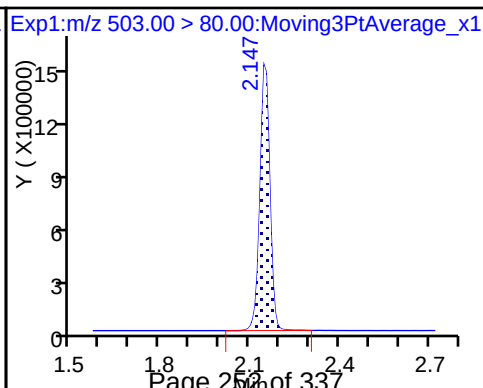
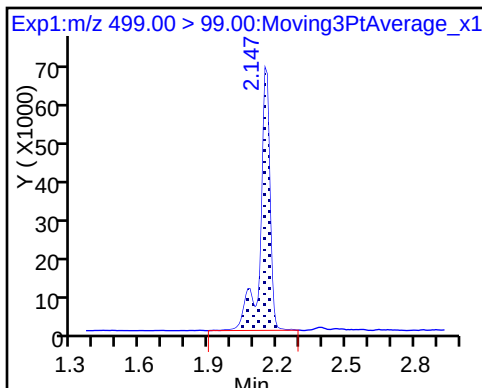
8 Perfluorooctane sulfonic acid



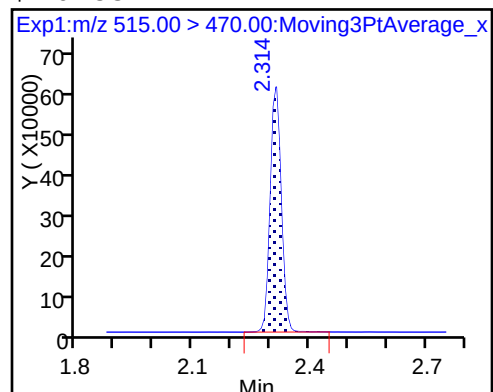
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: ICV 320-192908/13 Calibration Date: 11/03/2017 14:20  
 Instrument ID: A8\_N Calib Start Date: 11/03/2017 13:37  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01  
 Lab File ID: 2017.11.03\_537XICAL\_013.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D    | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|-------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | QuaF          |         | 0.8310 |         | 83.7           | 100             | -16.4 | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 0.9369  | 0.8136 |         | 8.68           | 10.0            | -13.2 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.674   | 1.463  |         | 17.5           | 20.1            | -12.6 | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 0.9258  | 0.7995 |         | 17.7           | 20.5            | -13.6 | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 0.9389  | 0.8637 |         | 18.1           | 19.7            | -8.0  | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.6642  | 0.6428 |         | 19.5           | 20.1            | -3.2  | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.039  |         | 9.44           | 10.0            | -5.6  | 30.0      |
| 13C2 PFDA                               | Ave           | 0.7652  | 0.7391 |         | 9.66           | 10.0            | -3.4  | 30.0      |



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_013.d  
 Lims ID: ICV  
 Client ID:  
 Sample Type: ICV  
 Inject. Date: 03-Nov-2017 14:20:03 ALS Bottle#: 7 Worklist Smp#: 13  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: ICV  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist:  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Nov-2017 15:39:08 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK021

First Level Reviewer: phomsophat

Date: 06-Nov-2017 07:27:24

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.442 | 1.444  | -0.002 | 1.000  | 9960387  | 83.7         |                 | 4998  |       |
| 298.90 > 99.00                  | 1.442 | 1.444  | -0.002 | 1.000  | 7235967  |              | 1.38(0.00-0.00) | 13514 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.571 | 1.573  | -0.003 | 1.000  | 1570629  | 9.44         |                 | 8393  |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.722 | 1.725  | -0.003 | 1.000  | 3517469  | 17.5         |                 | 5659  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.722 | 1.725  | -0.003 | 1.000  | 1229696  | 8.68         |                 | 345   |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.904 | 1.913  | -0.009 |        | 1512045  | 10.0         |                 | 7643  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.904 | 1.914  | -0.010 | 1.000  | 2476221  | 17.7         |                 | 475   |       |
| 413.00 > 169.00                 | 1.904 | 1.914  | -0.010 | 1.000  | 1327388  |              | 1.87(0.00-0.00) | 1724  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 2.140 | 2.147  | -0.007 | 1.000  | 2036944  | 18.1         |                 | 2323  |       |
| 499.00 > 99.00                  | 2.140 | 2.147  | -0.007 | 1.000  | 389736   |              | 5.23(0.00-0.00) | 830   |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 2.140 | 2.151  | -0.011 |        | 3433628  | 28.7         |                 | 5334  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 2.147 | 2.158  | -0.011 | 1.000  | 1956116  | 19.5         |                 | 652   |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.306 | 2.312  | -0.006 | 1.000  | 1117553  | 9.66         |                 | 6230  |       |

**Reagents:**

LC537-ICV\_00028

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_013.d

Injection Date: 03-Nov-2017 14:20:03

Instrument ID: A8\_N

Lims ID: ICV

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 7

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

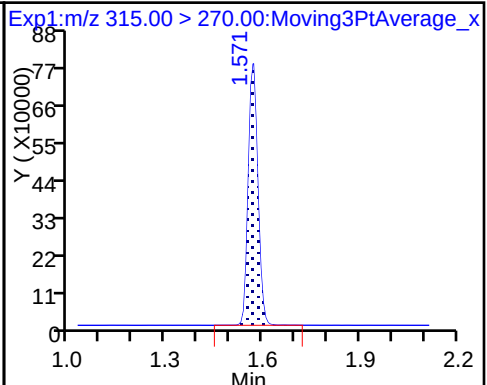
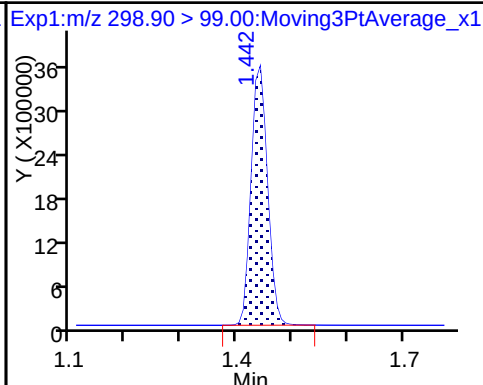
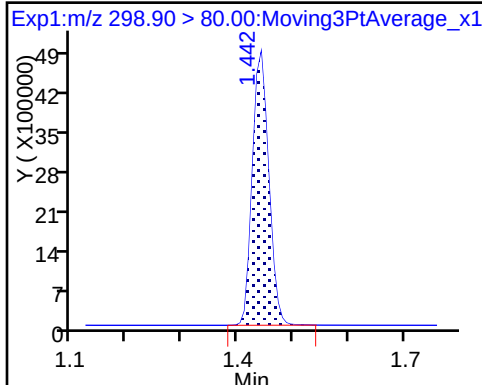
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

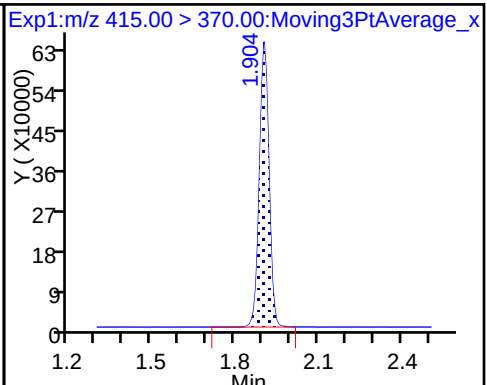
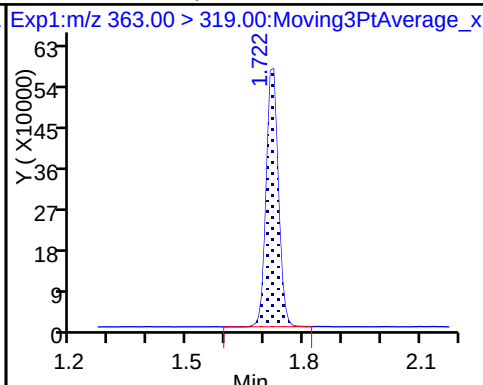
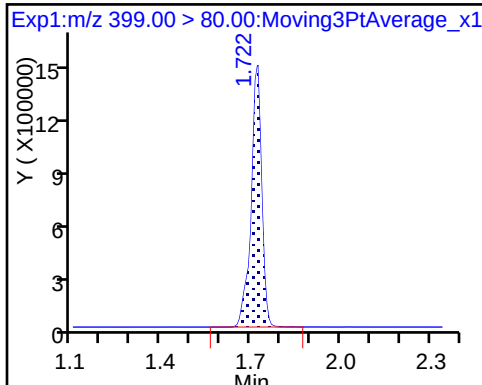
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

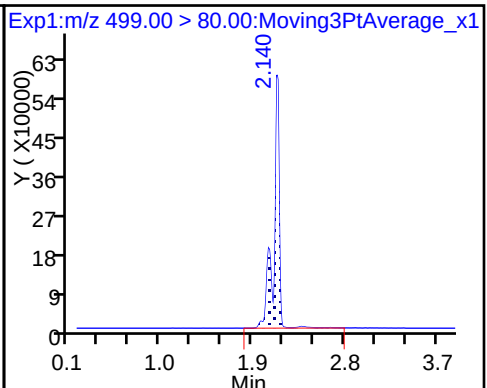
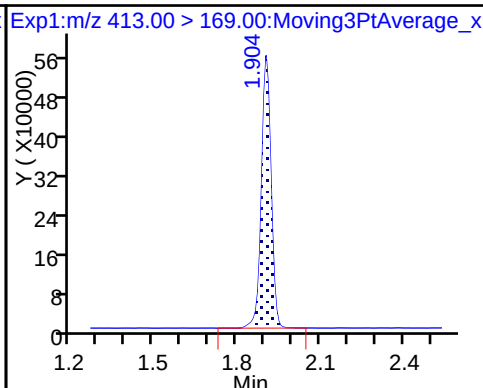
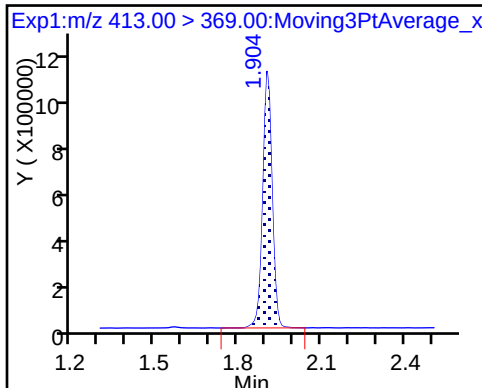
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

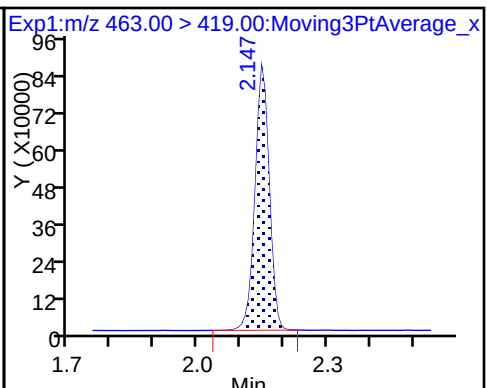
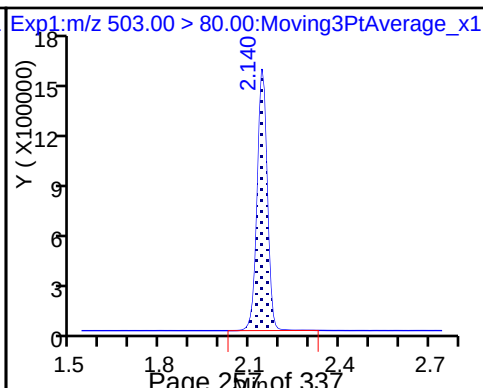
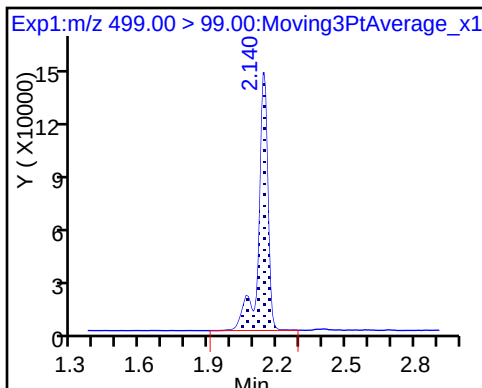
8 Perfluorooctane sulfonic acid



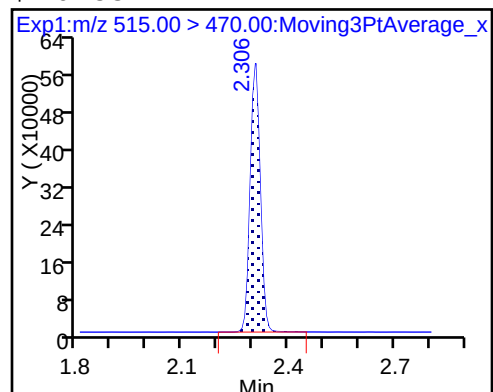
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-194241/1 Calibration Date: 11/13/2017 02:37  
 Instrument ID: A8\_N Calib Start Date: 11/03/2017 13:37  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01  
 Lab File ID: 2017.11.13\_537A\_004.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | QuaF          |         | 1.127  |         | 20.7           | 20.0            | 3.5  | 50.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 0.9369  | 0.9071 |         | 2.15           | 2.22            | -3.2 | 50.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.674   | 1.664  |         | 6.63           | 6.67            | -0.6 | 50.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 0.9258  | 0.9135 |         | 4.39           | 4.45            | -1.3 | 50.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 0.9389  | 0.9202 |         | 8.71           | 8.89            | -2.0 | 50.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.6642  | 0.6934 |         | 4.64           | 4.45            | 4.4  | 50.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.120  |         | 10.2           | 10.0            | 1.8  | 30.0      |
| 13C2 PFDA                               | Ave           | 0.7652  | 0.7392 |         | 9.66           | 10.0            | -3.4 | 30.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_004.d  
 Lims ID: CCVL  
 Client ID:  
 Sample Type: CCVL  
 Inject. Date: 13-Nov-2017 02:37:12 ALS Bottle#: 2 Worklist Smp#: 1  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCVL  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:11:55 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

First Level Reviewer: phomsophat

Date: 13-Nov-2017 11:10:28

| Signal                          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | S/N  | Flags |
|---------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid  |       |           |           |           |          |                 |                 |      |       |
| 298.90 > 80.00                  | 1.434 | 1.444     | -0.010    | 1.000     | 2524556  | 20.7            |                 | 1421 |       |
| 298.90 > 99.00                  | 1.434 | 1.444     | -0.010    | 1.000     | 1791255  |                 | 1.41(0.00-0.00) | 5607 |       |
| \$ 2 13C2 PFHxA                 |       |           |           |           |          |                 |                 |      |       |
| 315.00 > 270.00                 | 1.555 | 1.573     | -0.018    | 1.000     | 1751391  | 10.2            |                 | 6634 |       |
| 3 Perfluorohexanesulfonic acid  |       |           |           |           |          |                 |                 |      |       |
| 399.00 > 80.00                  | 1.707 | 1.725     | -0.018    | 1.000     | 1242810  | 6.63            |                 | 1599 |       |
| 4 Perfluoroheptanoic acid       |       |           |           |           |          |                 |                 |      |       |
| 363.00 > 319.00                 | 1.707 | 1.725     | -0.018    | 1.000     | 315213   | 2.15            |                 | 101  |       |
| * 6 13C2-PFOA                   |       |           |           |           |          |                 |                 |      |       |
| 415.00 > 370.00                 | 1.889 | 1.913     | -0.024    |           | 1563386  | 10.0            |                 | 4561 |       |
| 5 Perfluorooctanoic acid        |       |           |           |           |          |                 |                 |      |       |
| 413.00 > 369.00                 | 1.897 | 1.914     | -0.017    | 1.000     | 635278   | 4.39            |                 | 125  |       |
| 413.00 > 169.00                 | 1.897 | 1.914     | -0.017    | 1.000     | 343526   |                 | 1.85(0.00-0.00) | 386  |       |
| 8 Perfluorooctane sulfonic acid |       |           |           |           |          |                 |                 |      |       |
| 499.00 > 80.00                  | 2.132 | 2.117     | 0.015     | 1.000     | 916453   | 8.71            |                 | 821  | M     |
| 499.00 > 99.00                  | 2.132 | 2.117     | 0.015     | 1.000     | 187137   |                 | 4.90(0.00-0.00) | 486  | M     |
| * 7 13C4 PFOS                   |       |           |           |           |          |                 |                 |      |       |
| 503.00 > 80.00                  | 2.132 | 2.151     | -0.019    |           | 3212610  | 28.7            |                 | 4707 |       |
| 9 Perfluorononanoic acid        |       |           |           |           |          |                 |                 |      |       |
| 463.00 > 419.00                 | 2.140 | 2.158     | -0.018    | 1.000     | 481909   | 4.64            |                 | 176  |       |
| \$ 10 13C2 PFDA                 |       |           |           |           |          |                 |                 |      |       |
| 515.00 > 470.00                 | 2.299 | 2.312     | -0.013    | 1.000     | 1155578  | 9.66            |                 | 7334 |       |

## QC Flag Legend

### Review Flags

M - Manually Integrated

## Reagents:

LC537-L2\_00020

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_004.d

Injection Date: 13-Nov-2017 02:37:12

Instrument ID: A8\_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

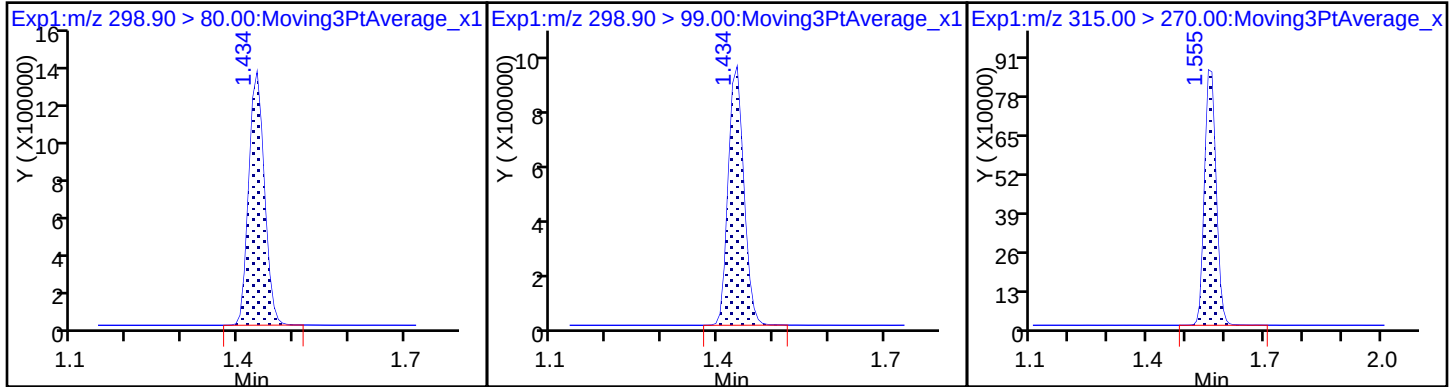
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

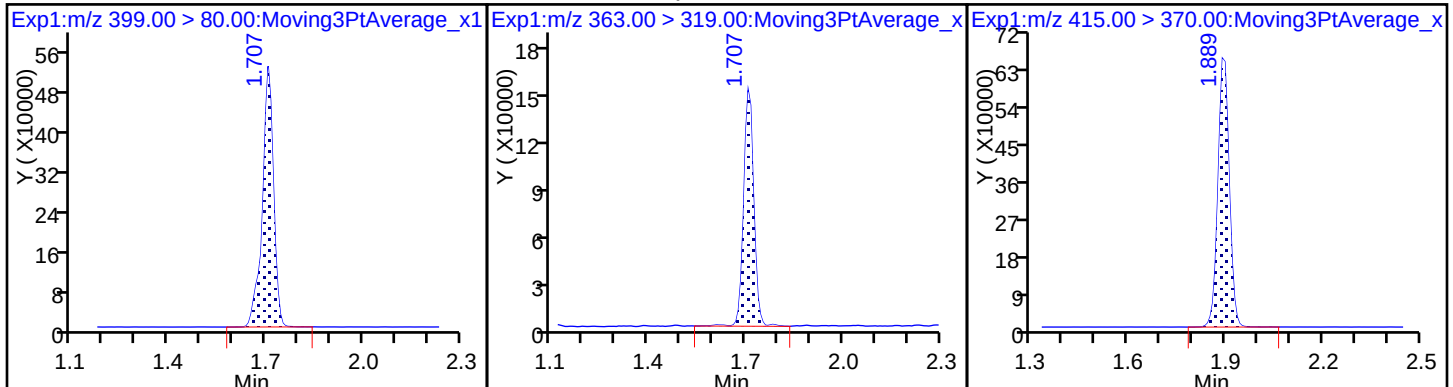
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

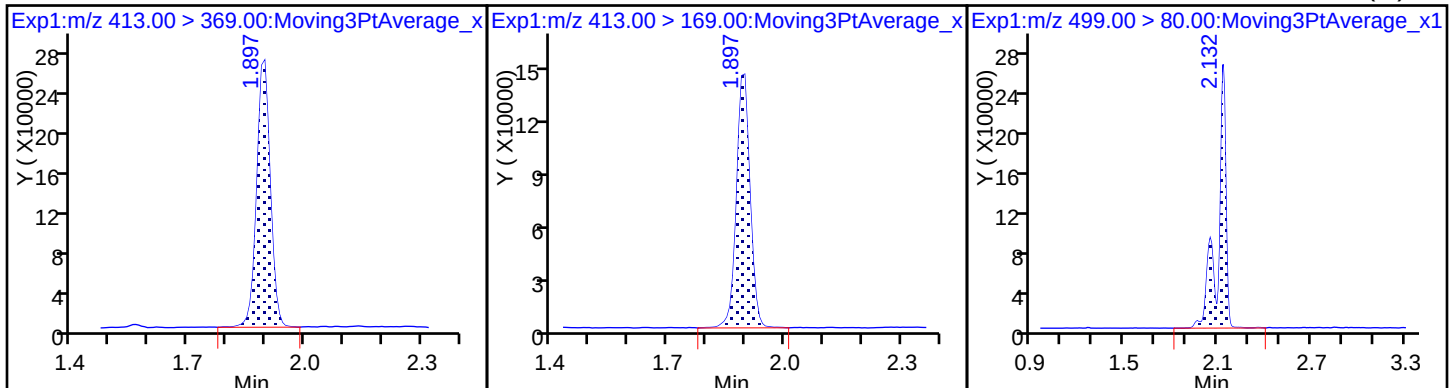
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

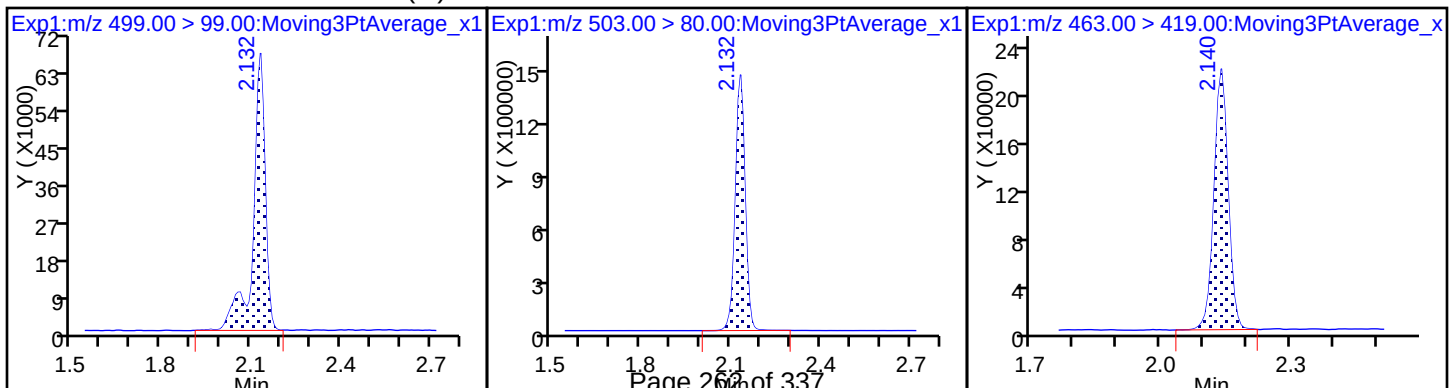
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid (M)

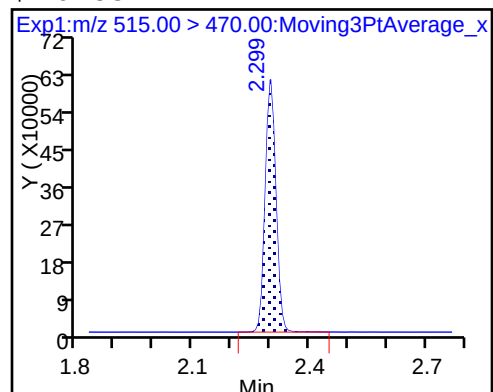
\* 7 13C4 PFOS

9 Perfluorononanoic acid





\$ 10 13C2 PFDA



## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_004.d

Injection Date: 13-Nov-2017 02:37:12

Instrument ID: A8\_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#:

2

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537\_A8\_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

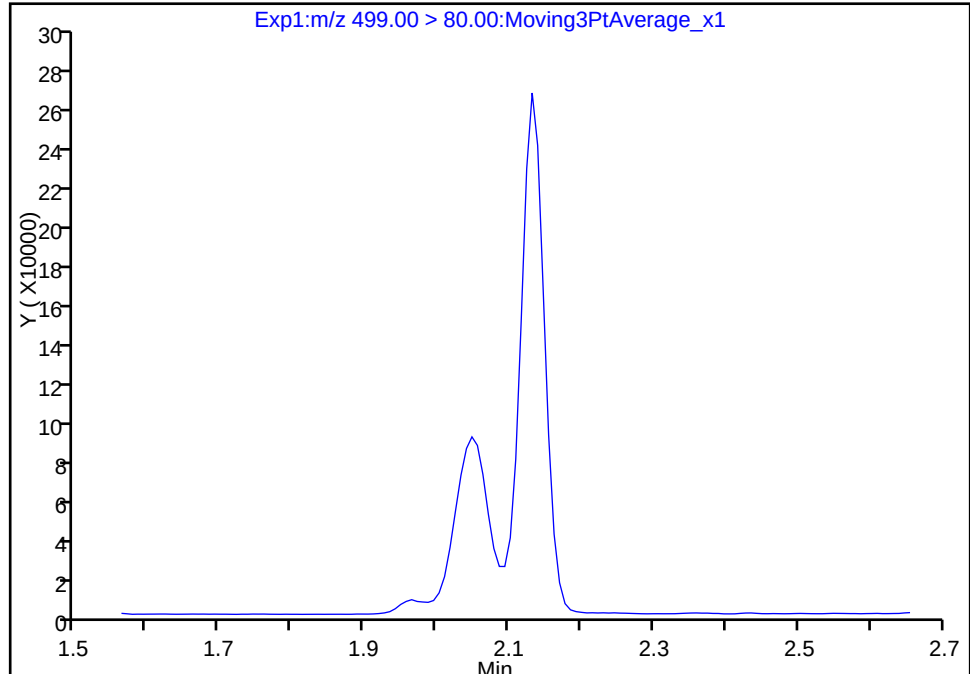
**8 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

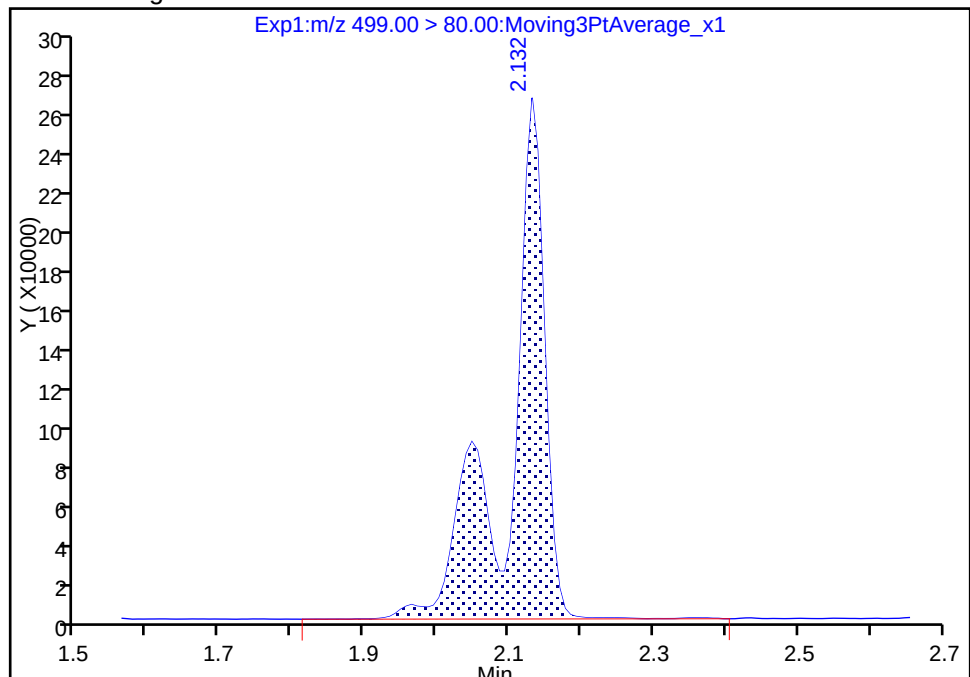
Not Detected

Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results



RT: 2.13

Area: 916453

Amount: 8.713437

Amount Units: ng/ml

Reviewer: phomsophat, 13-Nov-2017 11:09:29

Audit Action: Assigned Compound ID

Audit Reason: Incomplete Integration

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_004.d

Injection Date: 13-Nov-2017 02:37:12

Instrument ID: A8\_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537\_A8\_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

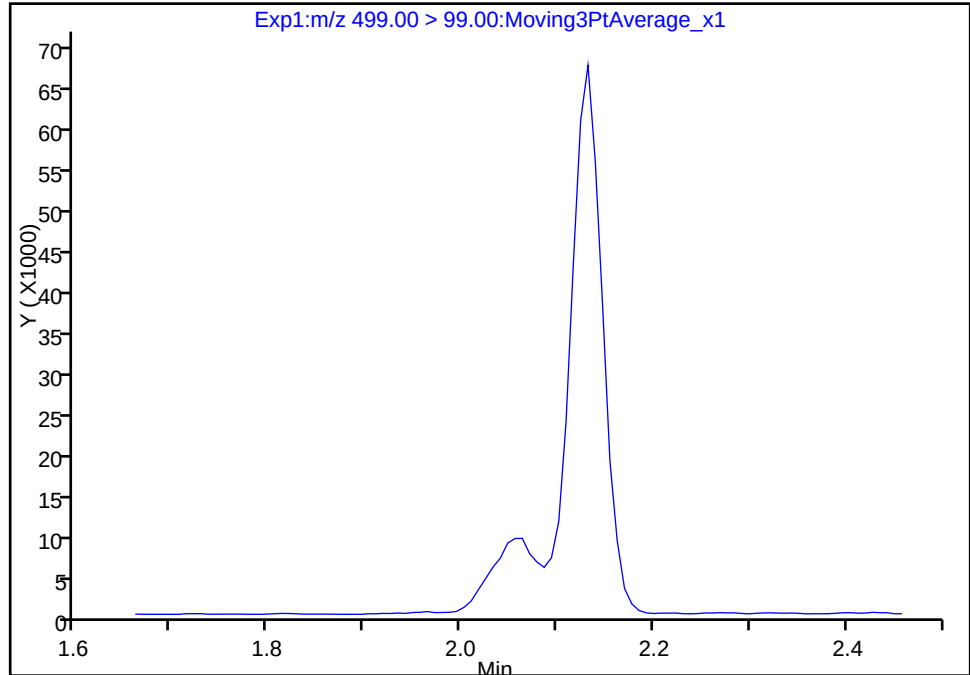
**8 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 2

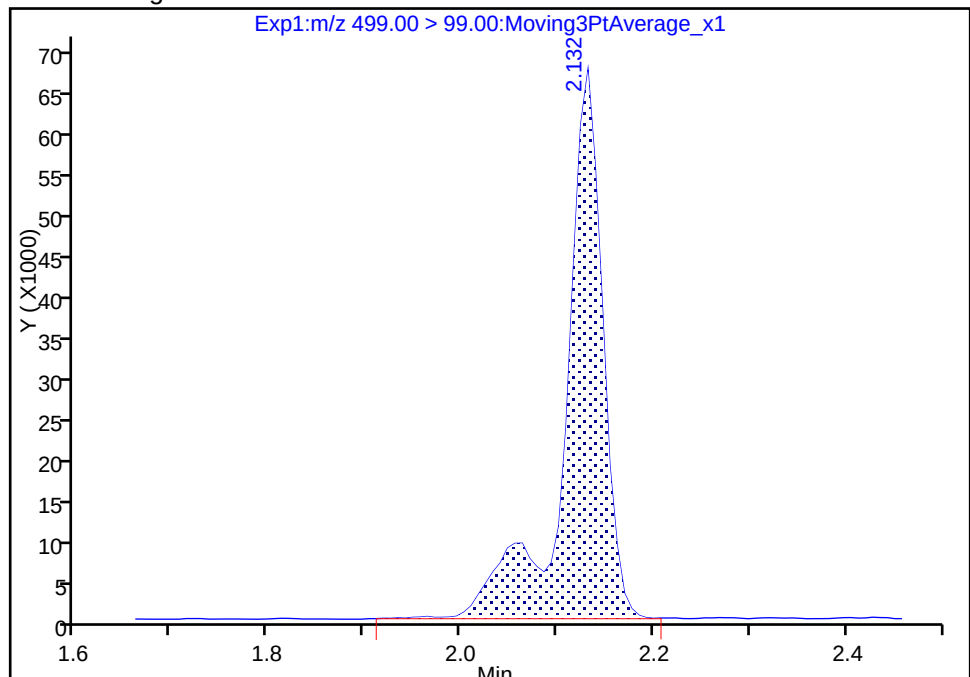
Not Detected

Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results



RT: 2.13

Area: 187137

Amount: 8.713437

Amount Units: ng/ml

Reviewer: phomsophat, 13-Nov-2017 11:09:50

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

## TestAmerica Sacramento

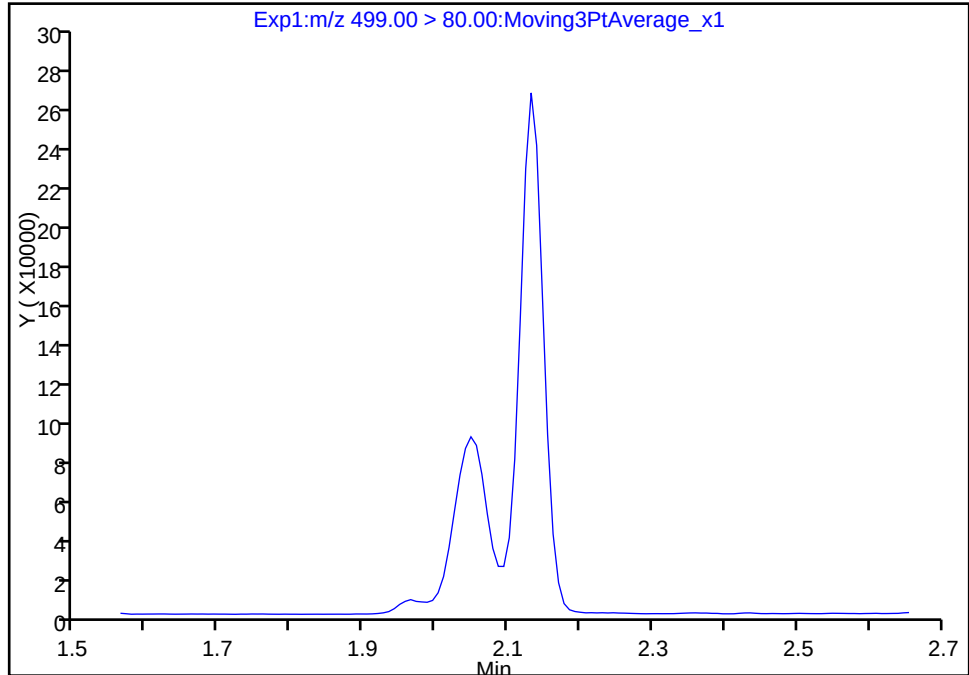
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_004.d  
Injection Date: 13-Nov-2017 02:37:12 Instrument ID: A8\_N  
Lims ID: CCVL  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 1  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

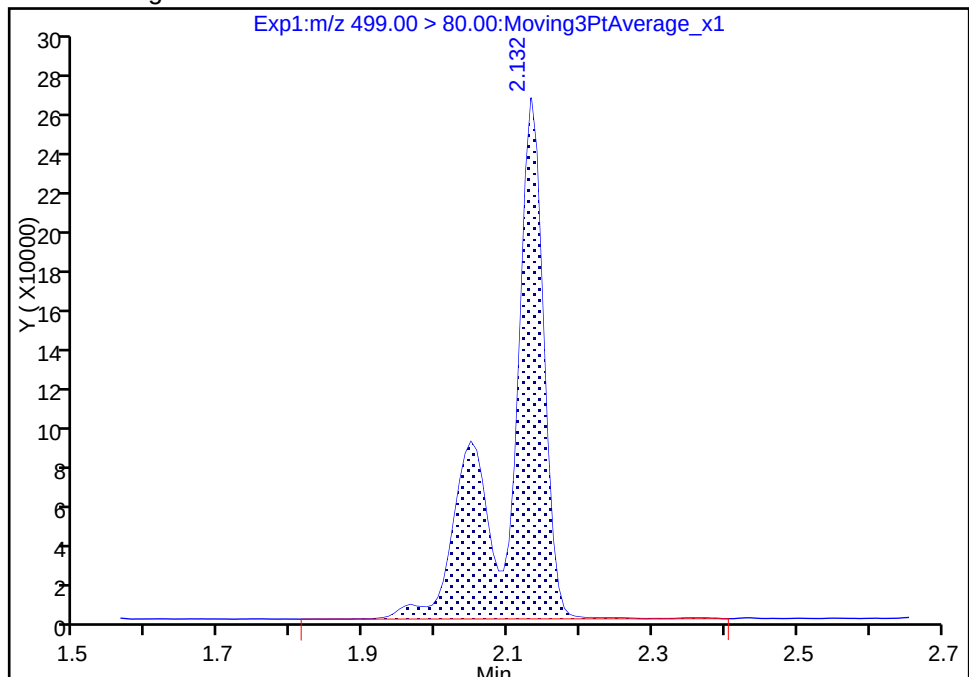
Not Detected  
Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results

RT: 2.13  
Area: 916453  
Amount: 8.713437  
Amount Units: ng/ml



Reviewer: phomsophat, 13-Nov-2017 11:09:50

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-194241/2 Calibration Date: 11/13/2017 02:41  
 Instrument ID: A8\_N Calib Start Date: 11/03/2017 13:37  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01  
 Lab File ID: 2017.11.13\_537A\_005.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | QuaF          |         | 1.145  |         | 49.3           | 45.0            | 9.5  | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 0.9369  | 0.9151 |         | 4.88           | 5.00            | -2.3 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.674   | 1.751  |         | 15.7           | 15.0            | 4.6  | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 0.9258  | 0.9280 |         | 10.0           | 10.0            | 0.2  | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 0.9389  | 0.9620 |         | 20.5           | 20.0            | 2.5  | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.6642  | 0.6857 |         | 10.3           | 10.0            | 3.2  | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.080  |         | 9.82           | 10.0            | -1.8 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.7652  | 0.7611 |         | 9.95           | 10.0            | -0.5 | 30.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_005.d  
 Lims ID: CCV L3  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 13-Nov-2017 02:41:52 ALS Bottle#: 3 Worklist Smp#: 2  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L3  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 16:55:12

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N  | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |      |       |
| 298.90 > 80.00                  | 1.426 | 1.444  | -0.018 | 1.000  | 5533265  | 49.3         |                 | 2635 |       |
| 298.90 > 99.00                  | 1.426 | 1.444  | -0.018 | 1.000  | 3864229  |              | 1.43(0.00-0.00) | 8337 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |      |       |
| 315.00 > 270.00                 | 1.555 | 1.573  | -0.018 | 1.000  | 1619081  | 9.82         |                 | 5834 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |      |       |
| 399.00 > 80.00                  | 1.707 | 1.725  | -0.018 | 1.000  | 2822101  | 15.7         |                 | 3078 |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |      |       |
| 363.00 > 319.00                 | 1.707 | 1.725  | -0.018 | 1.000  | 686089   | 4.88         |                 | 214  |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |      |       |
| 415.00 > 370.00                 | 1.889 | 1.913  | -0.024 |        | 1499119  | 10.0         |                 | 4637 |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |      |       |
| 413.00 > 369.00                 | 1.897 | 1.914  | -0.017 | 1.000  | 1392358  | 10.0         |                 | 267  |       |
| 413.00 > 169.00                 | 1.897 | 1.914  | -0.017 | 1.000  | 720417   |              | 1.93(0.00-0.00) | 823  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |      |       |
| 499.00 > 80.00                  | 2.132 | 2.117  | 0.015  | 1.000  | 2067365  | 20.5         |                 | 1645 | M     |
| 499.00 > 99.00                  | 2.132 | 2.117  | 0.015  | 1.000  | 409140   |              | 5.05(0.00-0.00) | 923  | M     |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |      |       |
| 503.00 > 80.00                  | 2.132 | 2.151  | -0.019 |        | 3081036  | 28.7         |                 | 3979 |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |      |       |
| 463.00 > 419.00                 | 2.140 | 2.158  | -0.018 | 1.000  | 1028064  | 10.3         |                 | 358  |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |      |       |
| 515.00 > 470.00                 | 2.299 | 2.312  | -0.013 | 1.000  | 1141043  | 9.95         |                 | 5001 |       |

## QC Flag Legend

### Review Flags

M - Manually Integrated

## Reagents:

LC537-L3\_00023

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_005.d

Injection Date: 13-Nov-2017 02:41:52

Instrument ID: A8\_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

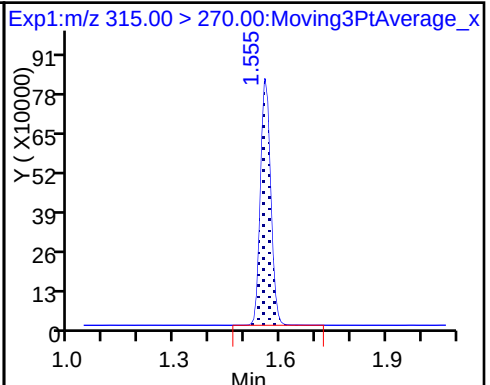
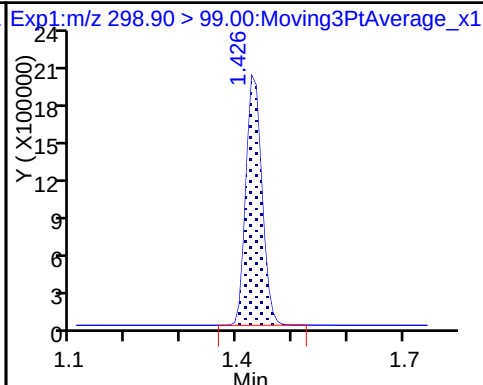
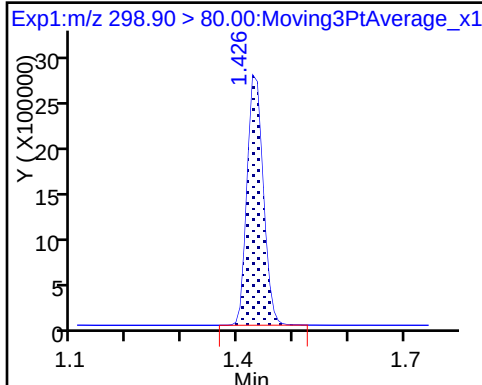
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

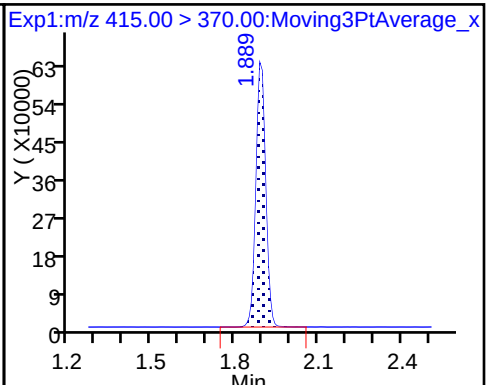
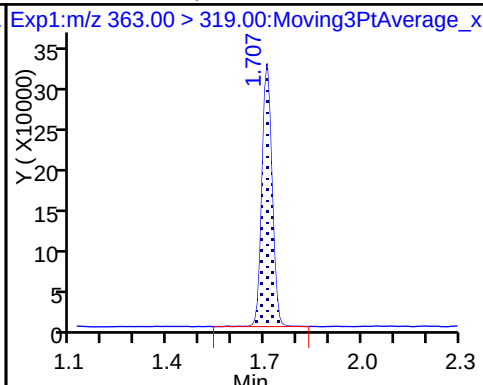
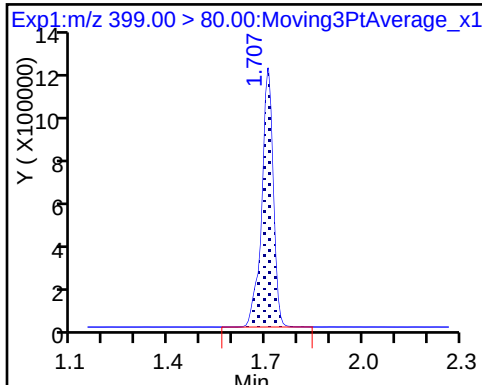
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

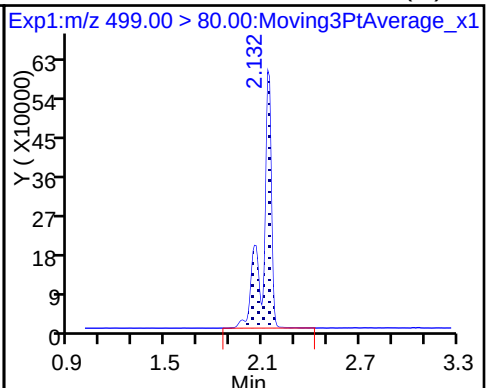
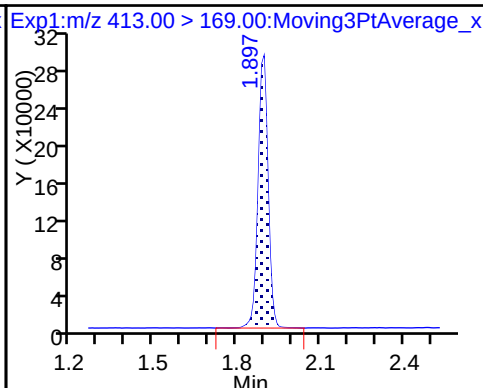
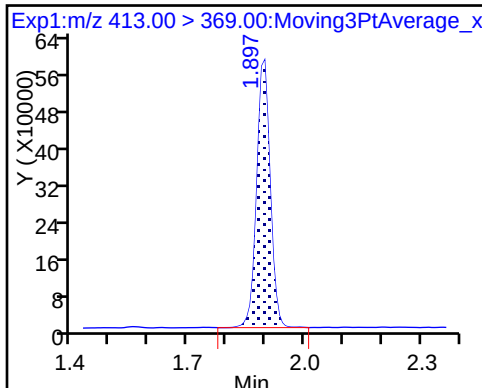
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

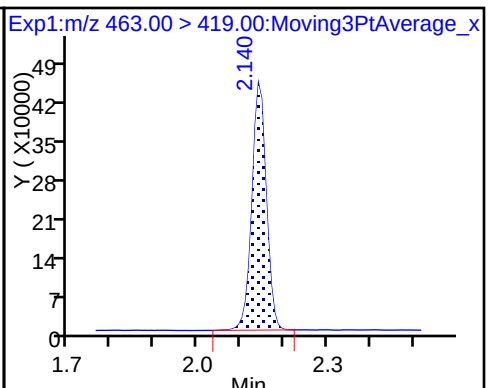
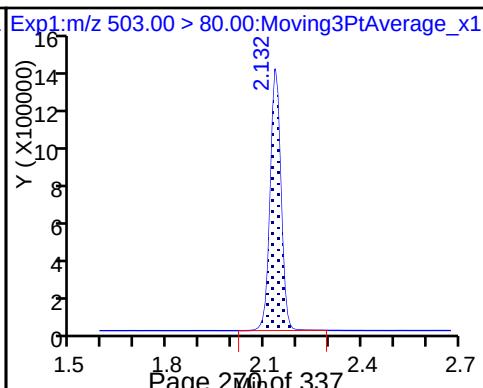
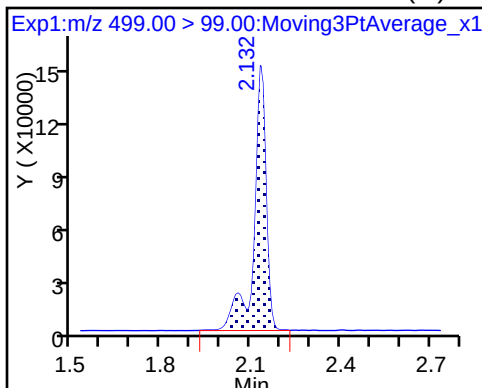
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid (M)

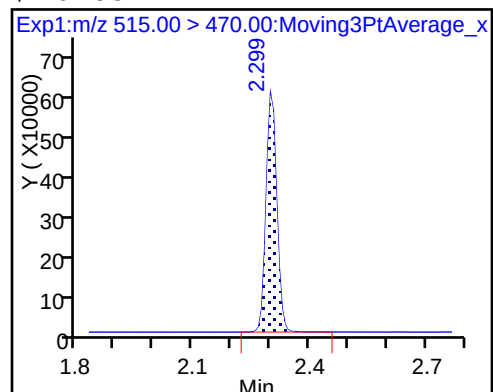
\* 7 13C4 PFOS

9 Perfluorononanoic acid





\$ 10 13C2 PFDA



## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_005.d

Injection Date: 13-Nov-2017 02:41:52

Instrument ID: A8\_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537\_A8\_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

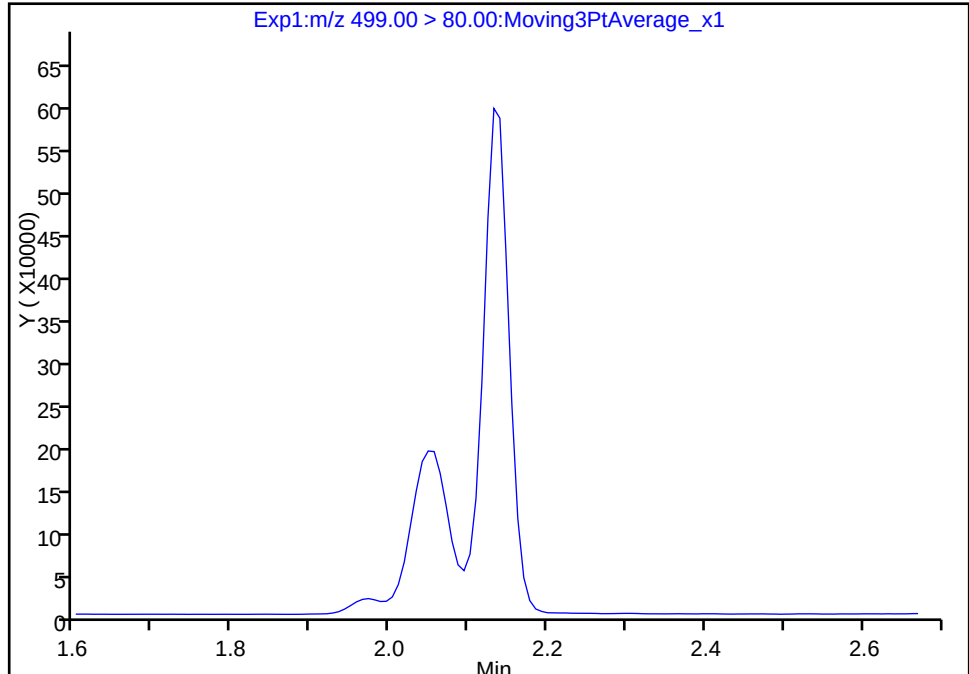
**8 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

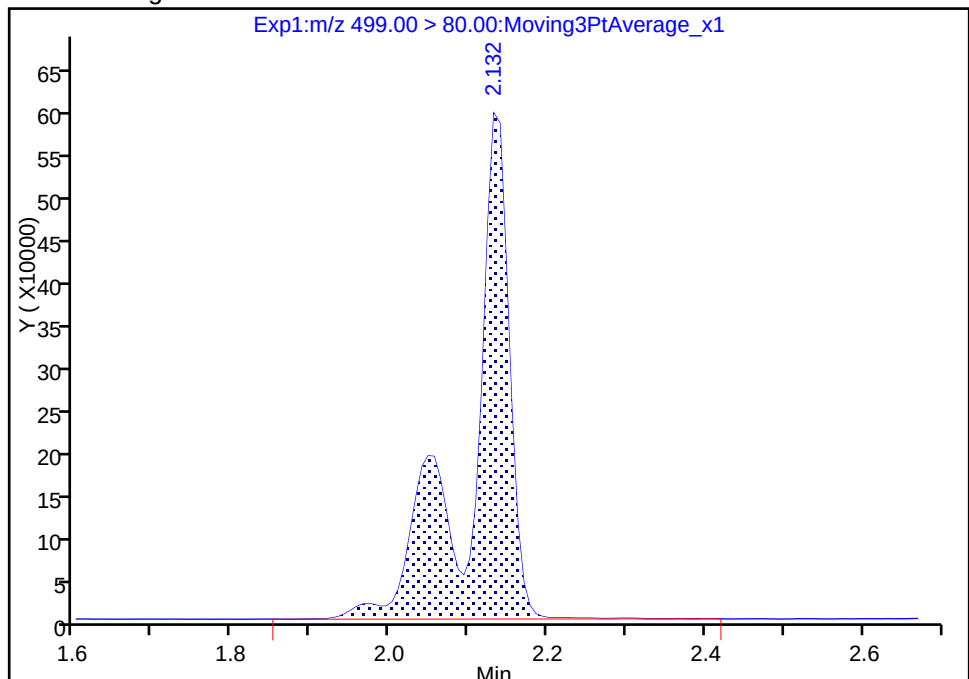
Not Detected

Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results



RT: 2.13

Area: 2067365

Amount: 20.495460

Amount Units: ng/ml

Reviewer: barnettj, 14-Nov-2017 16:54:23

Audit Action: Assigned Compound ID

Audit Reason: Isomers

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_005.d

Injection Date: 13-Nov-2017 02:41:52

Instrument ID: A8\_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#:

3

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537\_A8\_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

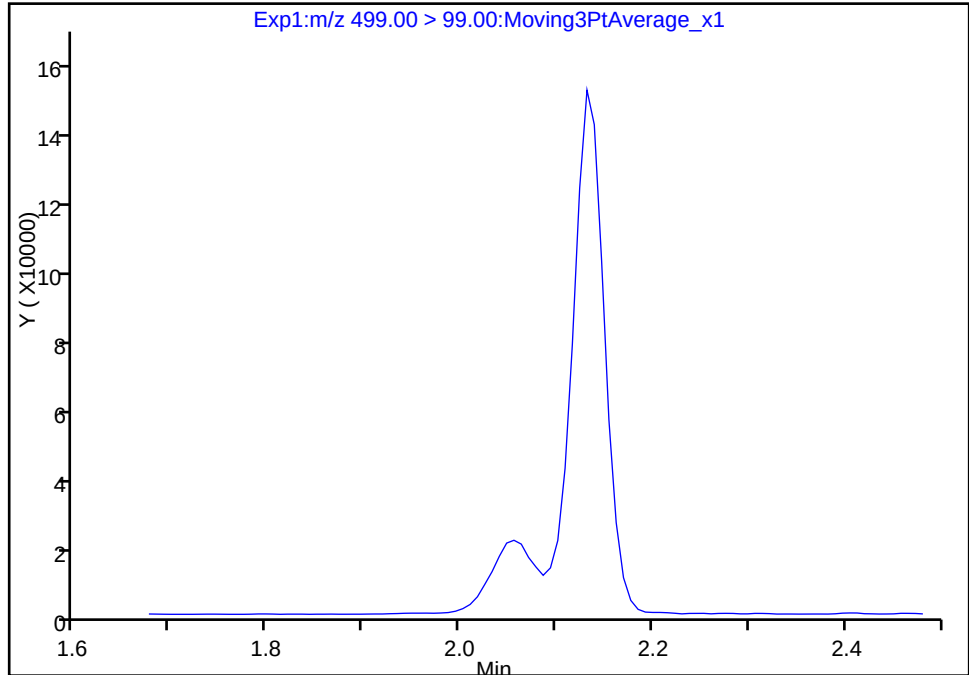
**8 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 2

Not Detected

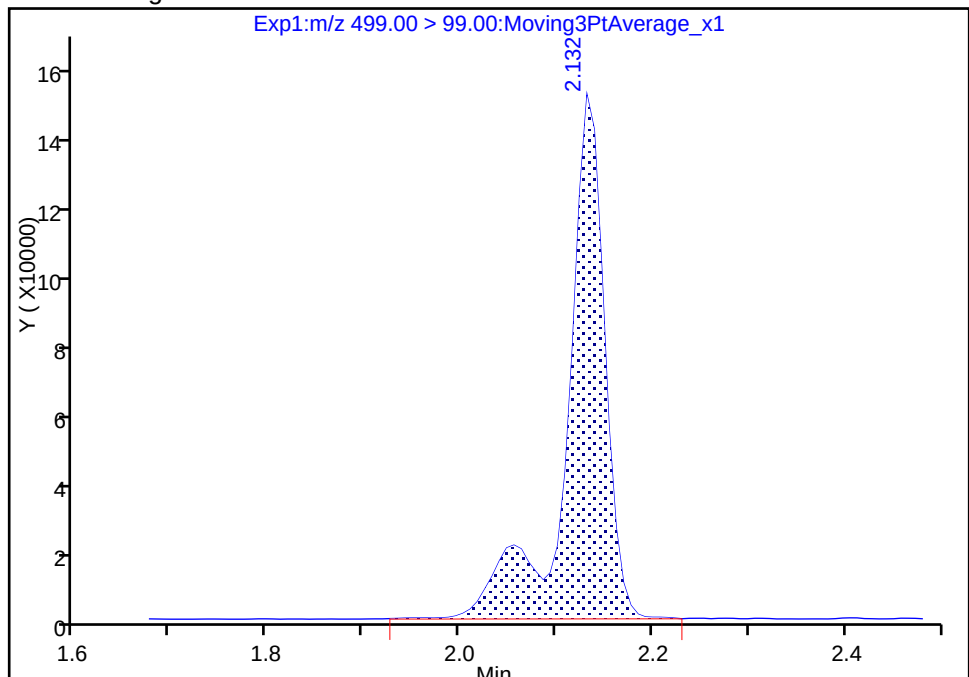
Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results

RT: 2.13  
Area: 409140  
Amount: 20.495460  
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:55:04

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_005.d

Injection Date: 13-Nov-2017 02:41:52

Instrument ID: A8\_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537\_A8\_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

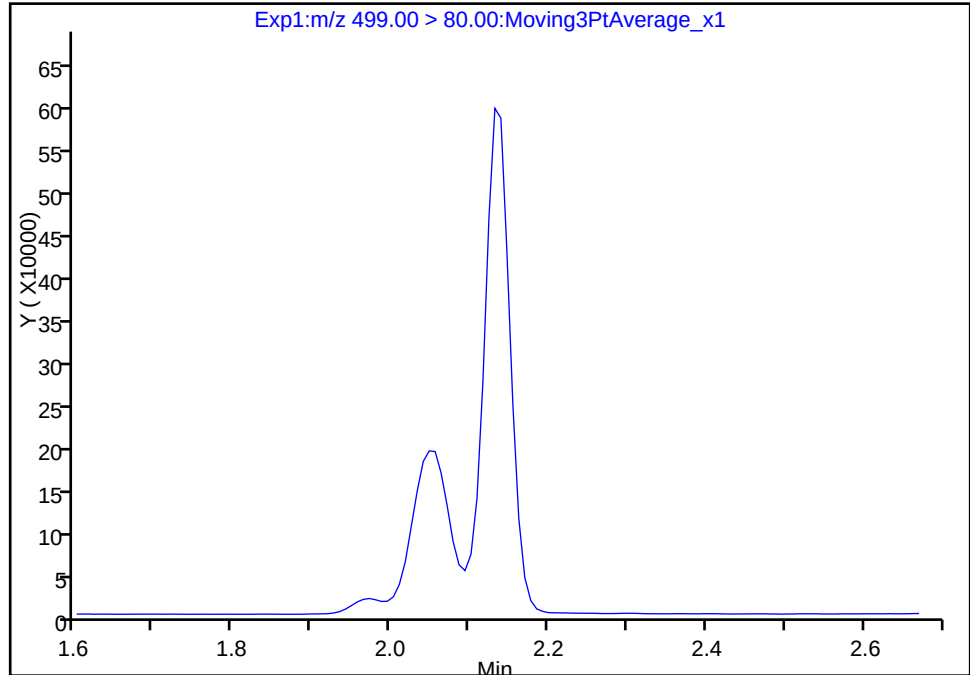
**8 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

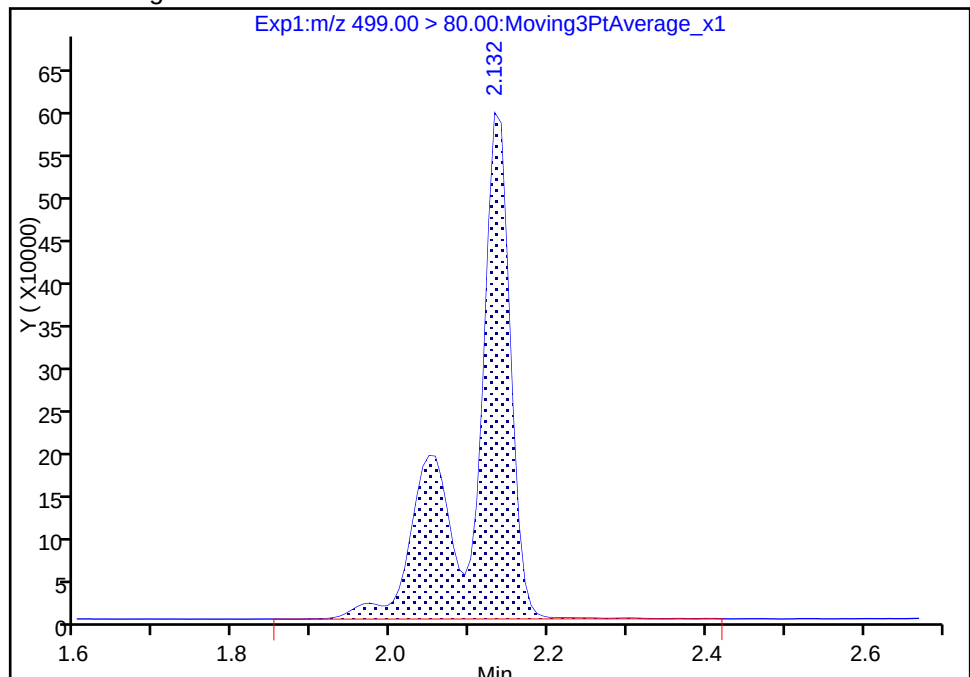
Not Detected

Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results



RT: 2.13

Area: 2067365

Amount: 20.495460

Amount Units: ng/ml

Reviewer: barnettj, 14-Nov-2017 16:55:04

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-194241/14 Calibration Date: 11/13/2017 03:38  
 Instrument ID: A8\_N Calib Start Date: 11/03/2017 13:37  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01  
 Lab File ID: 2017.11.13\_537A\_017.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | QuaF          |         | 0.9190 |         | 135            | 135             | 0.3  | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 0.9369  | 0.9320 |         | 14.9           | 15.0            | -0.5 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.674   | 1.682  |         | 45.2           | 45.0            | 0.5  | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 0.9258  | 0.9706 |         | 31.5           | 30.0            | 4.8  | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 0.9389  | 0.9543 |         | 61.0           | 60.0            | 1.6  | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.6642  | 0.6855 |         | 31.0           | 30.0            | 3.2  | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.089  |         | 9.90           | 10.0            | -1.0 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.7652  | 0.7607 |         | 9.94           | 10.0            | -0.6 | 30.0      |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-194251/14 Calibration Date: 11/13/2017 03:38  
 Instrument ID: A8\_N Calib Start Date: 11/03/2017 13:37  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01  
 Lab File ID: 2017.11.13\_537A\_017.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | QuaF          |         | 0.9190 |         | 135            | 135             | 0.3  | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 0.9369  | 0.9320 |         | 14.9           | 15.0            | -0.5 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.674   | 1.682  |         | 45.2           | 45.0            | 0.5  | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 0.9258  | 0.9706 |         | 31.5           | 30.0            | 4.8  | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 0.9389  | 0.9543 |         | 61.0           | 60.0            | 1.6  | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.6642  | 0.6855 |         | 31.0           | 30.0            | 3.2  | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.089  |         | 9.90           | 10.0            | -1.0 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.7652  | 0.7607 |         | 9.94           | 10.0            | -0.6 | 30.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_017.d  
 Lims ID: CCV L5  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 13-Nov-2017 03:38:02 ALS Bottle#: 5 Worklist Smp#: 14  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L5  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 17:02:10

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.426 | 1.444  | -0.018 | 1.000  | 13825669 | 135.4        |                 | 5956  |       |
| 298.90 > 99.00                  | 1.426 | 1.444  | -0.018 | 1.000  | 10392378 |              | 1.33(0.00-0.00) | 16075 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.555 | 1.573  | -0.018 | 1.000  | 1656017  | 9.90         |                 | 6690  |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.699 | 1.725  | -0.026 | 1.000  | 8436762  | 45.2         |                 | 7555  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.699 | 1.725  | -0.026 | 1.000  | 2126172  | 14.9         |                 | 684   |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.889 | 1.913  | -0.024 |        | 1520572  | 10.0         |                 | 5575  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.889 | 1.914  | -0.025 | 1.000  | 4431349  | 31.5         |                 | 844   |       |
| 413.00 > 169.00                 | 1.889 | 1.914  | -0.025 | 1.000  | 2253709  |              | 1.97(0.00-0.00) | 2468  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 2.124 | 2.117  | 0.007  | 1.000  | 6381441  | 61.0         |                 | 4229  | M     |
| 499.00 > 99.00                  | 2.124 | 2.117  | 0.007  | 1.000  | 1286454  |              | 4.96(0.00-0.00) | 2536  | M     |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 2.124 | 2.151  | -0.027 |        | 3195765  | 28.7         |                 | 4281  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 2.132 | 2.158  | -0.026 | 1.000  | 3127450  | 31.0         |                 | 1020  |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.299 | 2.312  | -0.013 | 1.000  | 1156753  | 9.94         |                 | 6335  |       |

## QC Flag Legend

### Review Flags

M - Manually Integrated

## Reagents:

LC537-L5\_00024

Amount Added: 1.00

Units: mL



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_017.d  
 Lims ID: CCV L5  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 13-Nov-2017 03:38:02 ALS Bottle#: 5 Worklist Smp#: 14  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L5  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:12:07 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 17:02:10

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.426 | 1.444  | -0.018 | 1.000  | 13825669 | 135.4        |                 | 5956  |       |
| 298.90 > 99.00                  | 1.426 | 1.444  | -0.018 | 1.000  | 10392378 |              | 1.33(0.00-0.00) | 16075 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.555 | 1.573  | -0.018 | 1.000  | 1656017  | 9.90         |                 | 6690  |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.699 | 1.725  | -0.026 | 1.000  | 8436762  | 45.2         |                 | 7555  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.699 | 1.725  | -0.026 | 1.000  | 2126172  | 14.9         |                 | 684   |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.889 | 1.913  | -0.024 |        | 1520572  | 10.0         |                 | 5575  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.889 | 1.914  | -0.025 | 1.000  | 4431349  | 31.5         |                 | 844   |       |
| 413.00 > 169.00                 | 1.889 | 1.914  | -0.025 | 1.000  | 2253709  |              | 1.97(0.00-0.00) | 2468  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 2.124 | 2.117  | 0.007  | 1.000  | 6381441  | 61.0         |                 | 4229  | M     |
| 499.00 > 99.00                  | 2.124 | 2.117  | 0.007  | 1.000  | 1286454  |              | 4.96(0.00-0.00) | 2536  | M     |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 2.124 | 2.151  | -0.027 |        | 3195765  | 28.7         |                 | 4281  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 2.132 | 2.158  | -0.026 | 1.000  | 3127450  | 31.0         |                 | 1020  |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.299 | 2.312  | -0.013 | 1.000  | 1156753  | 9.94         |                 | 6335  |       |

## QC Flag Legend

### Review Flags

M - Manually Integrated

## Reagents:

LC537-L5\_00024

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_017.d

Injection Date: 13-Nov-2017 03:38:02

Instrument ID: A8\_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 14

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

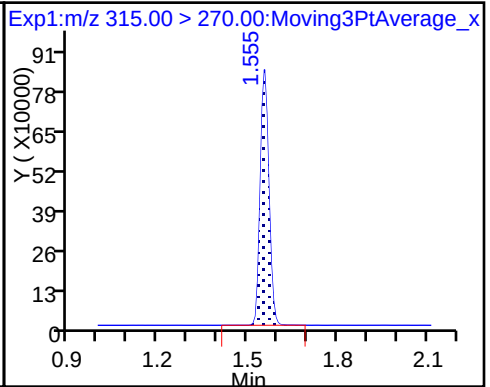
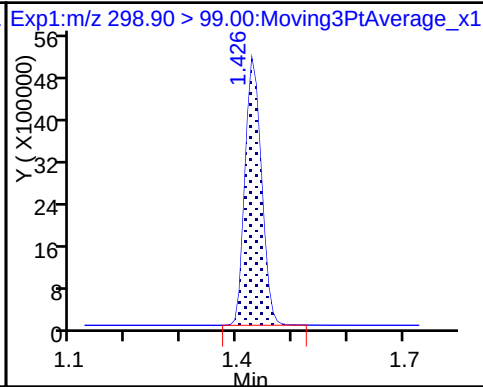
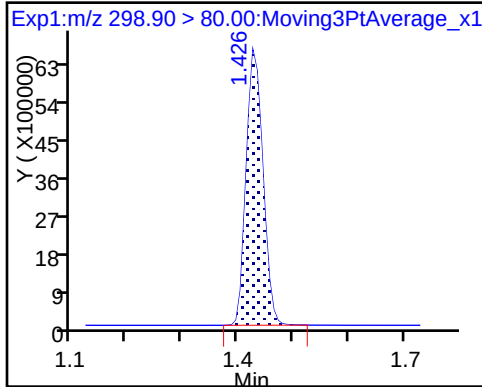
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

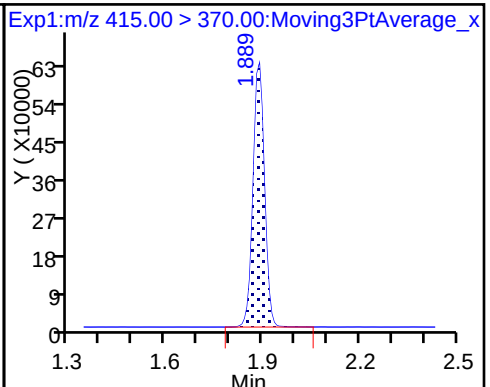
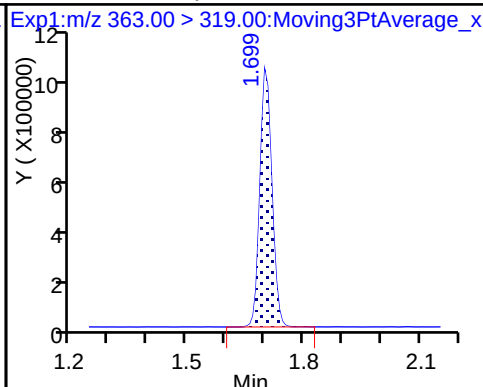
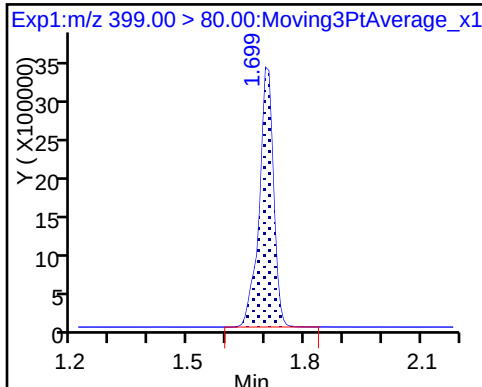
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

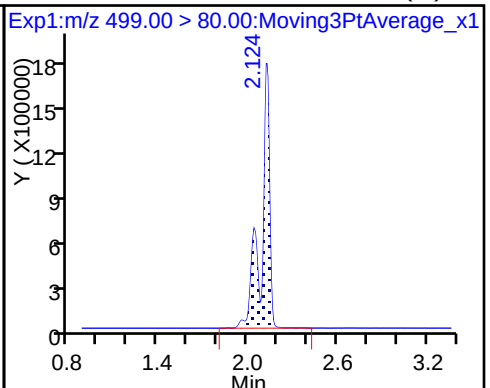
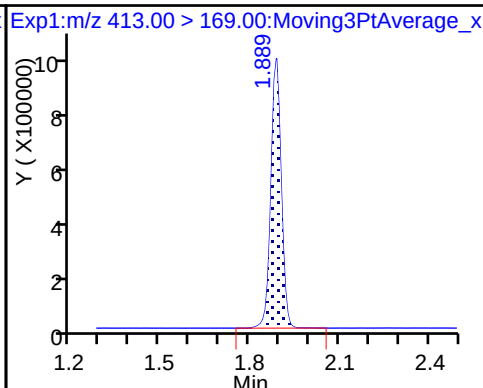
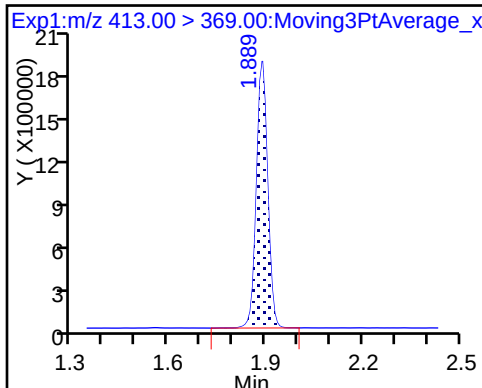
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

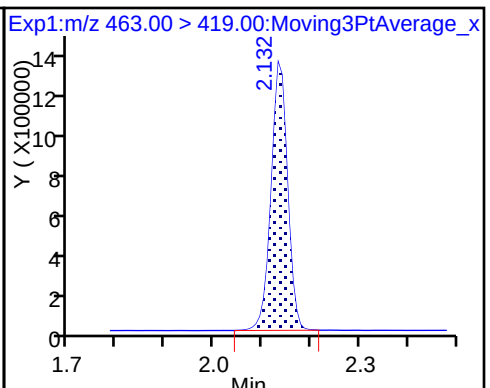
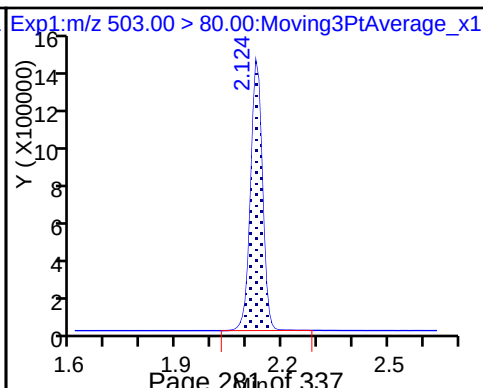
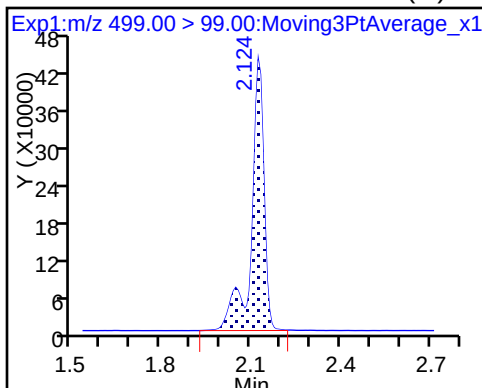
8 Perfluorooctane sulfonic acid (M)



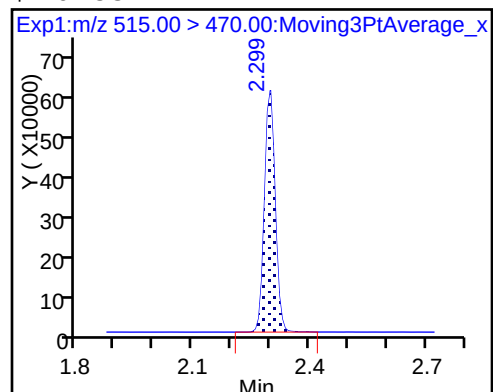
8 Perfluorooctane sulfonic acid (M)

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_017.d

Injection Date: 13-Nov-2017 03:38:02

Instrument ID: A8\_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 14

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

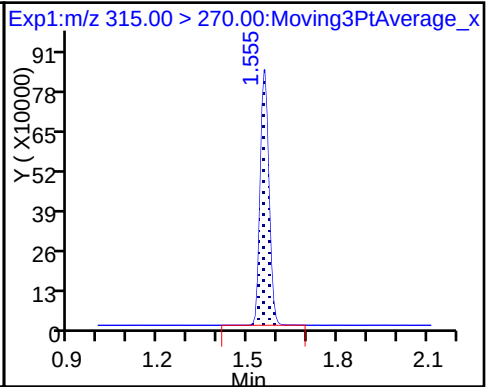
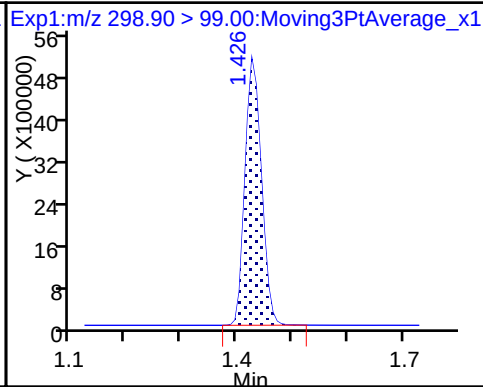
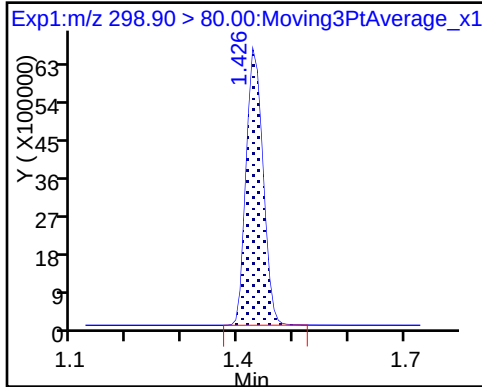
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

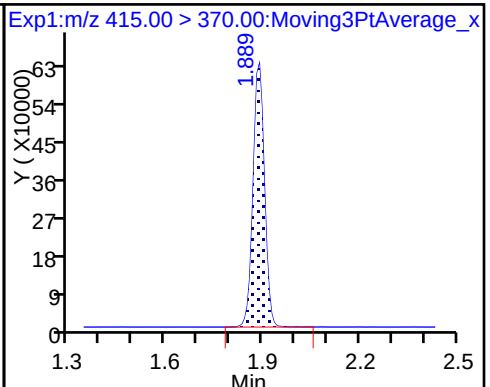
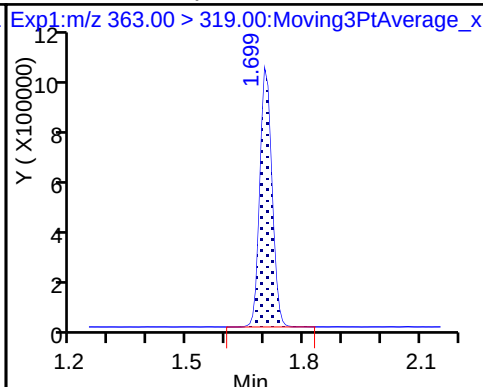
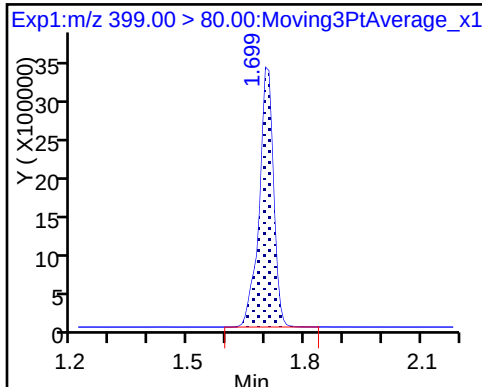
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

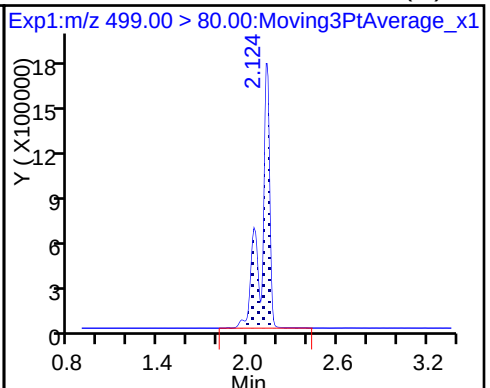
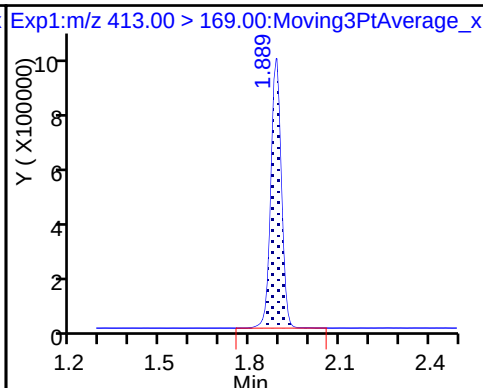
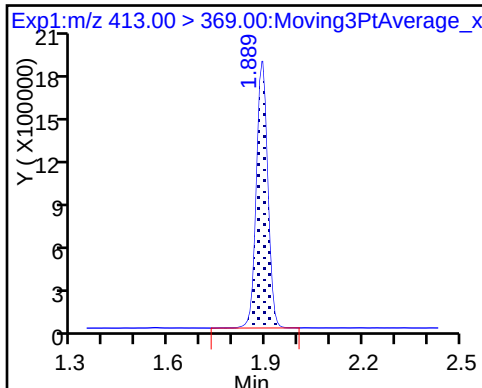
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

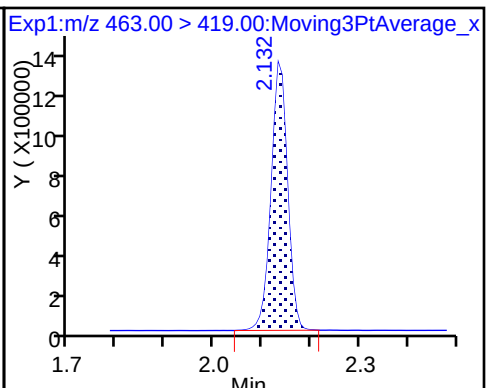
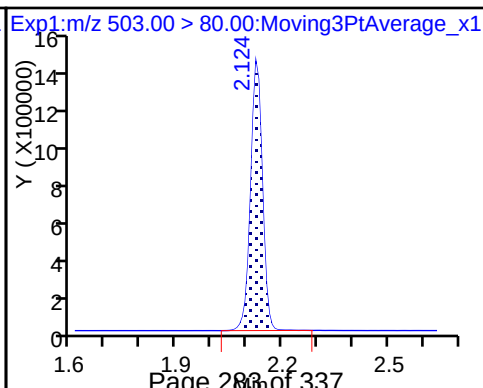
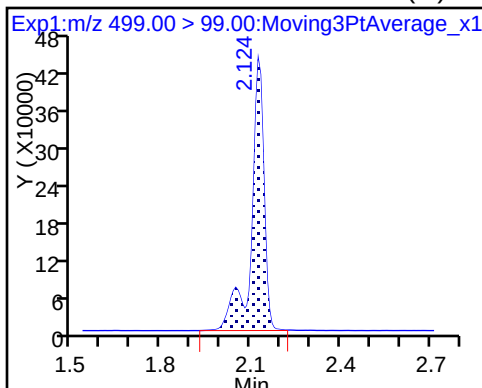
8 Perfluorooctane sulfonic acid (M)



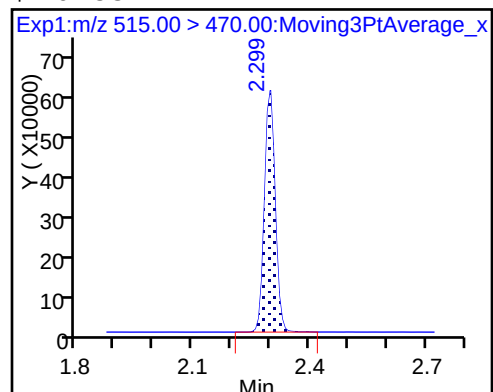
8 Perfluorooctane sulfonic acid (M)

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



## TestAmerica Sacramento

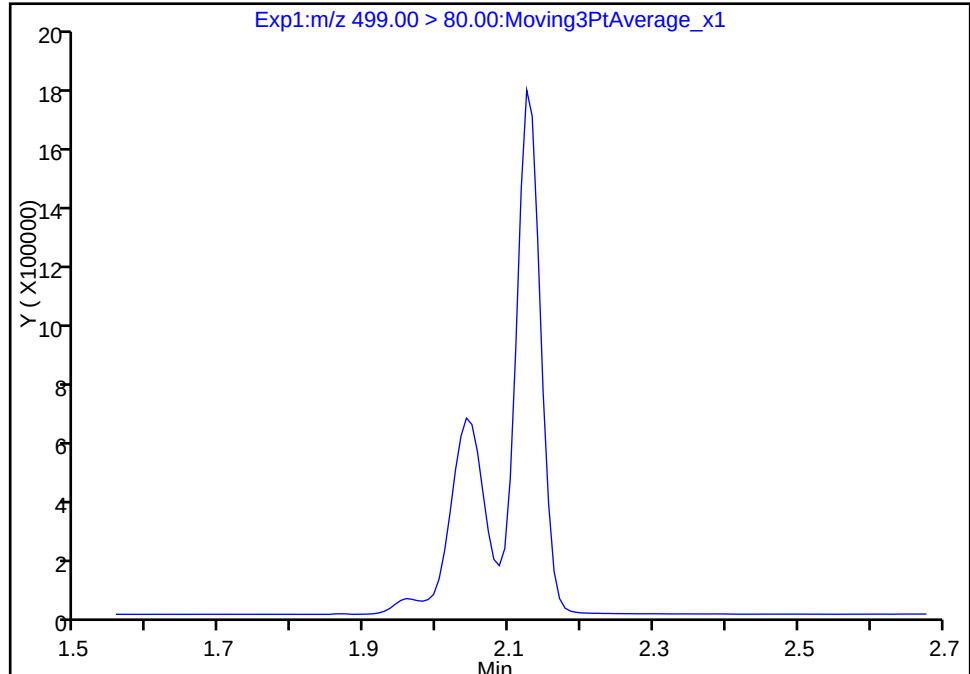
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_017.d  
Injection Date: 13-Nov-2017 03:38:02 Instrument ID: A8\_N  
Lims ID: CCV L5  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 14  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

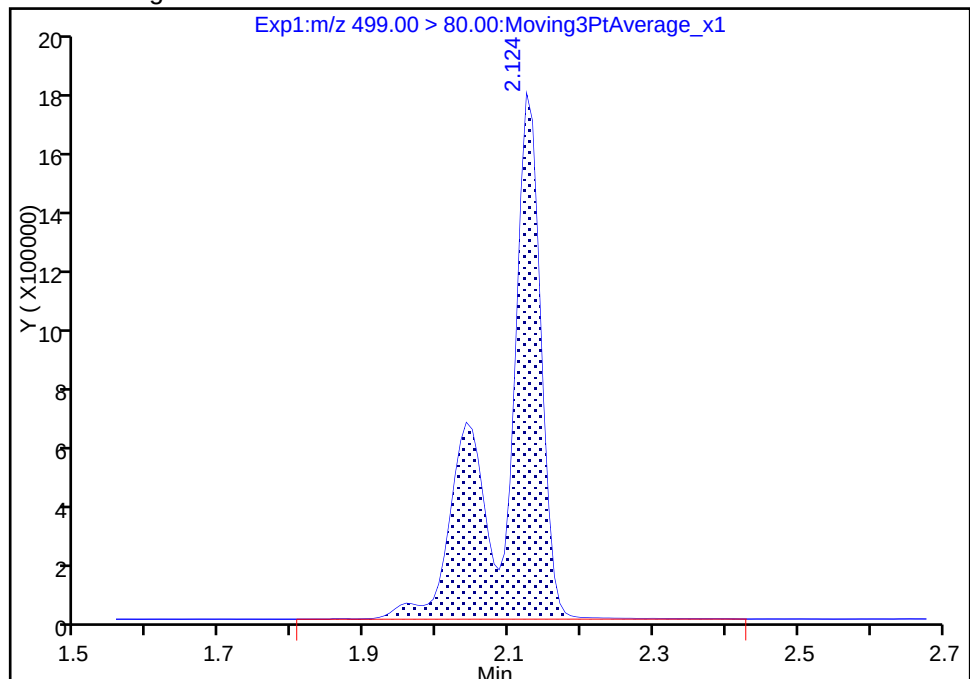
Not Detected  
Expected RT: 2.12

## Processing Integration Results



RT: 2.12  
Area: 6381441  
Amount: 60.993170  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: barnettj, 14-Nov-2017 17:01:48

Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

## TestAmerica Sacramento

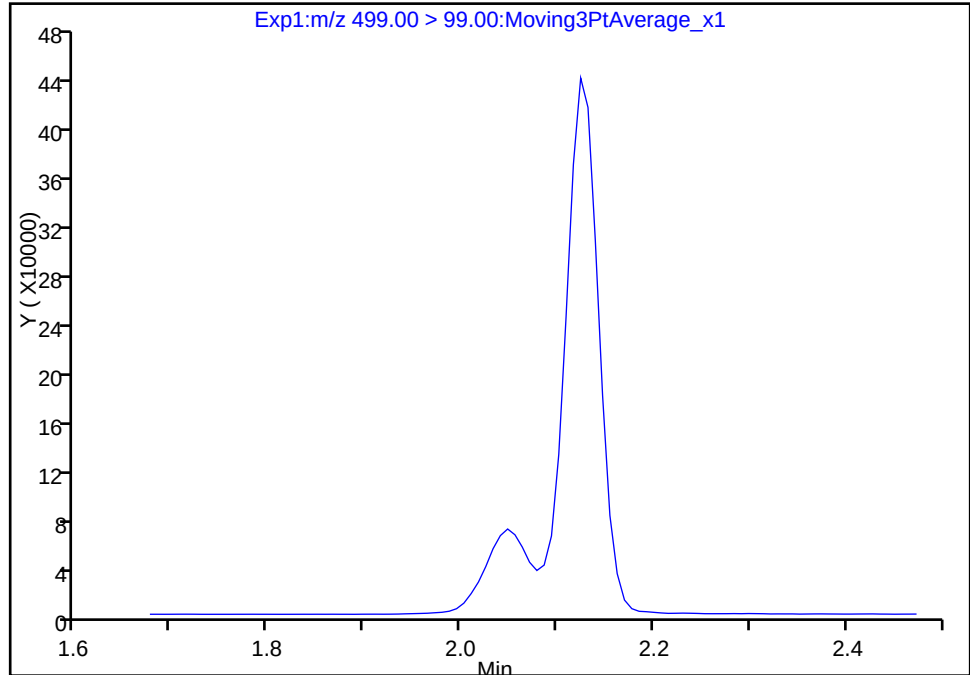
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_017.d  
Injection Date: 13-Nov-2017 03:38:02 Instrument ID: A8\_N  
Lims ID: CCV L5  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 14  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 2

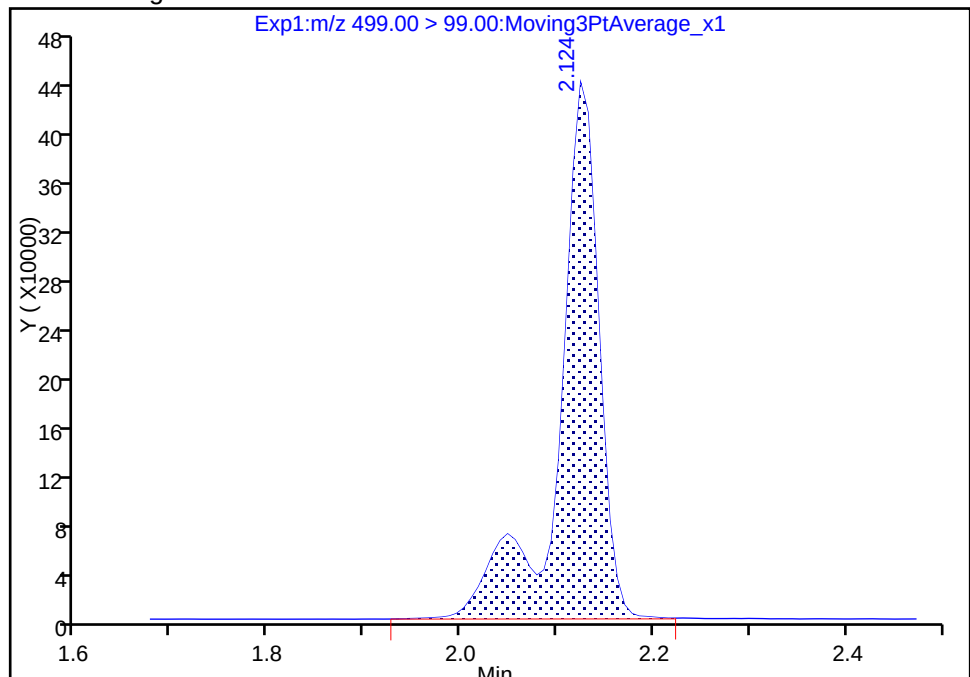
Not Detected  
Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results

RT: 2.12  
Area: 1286454  
Amount: 60.993170  
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:02:01

Audit Action: Manually Integrated

Audit Reason: Missed Peak



## TestAmerica Sacramento

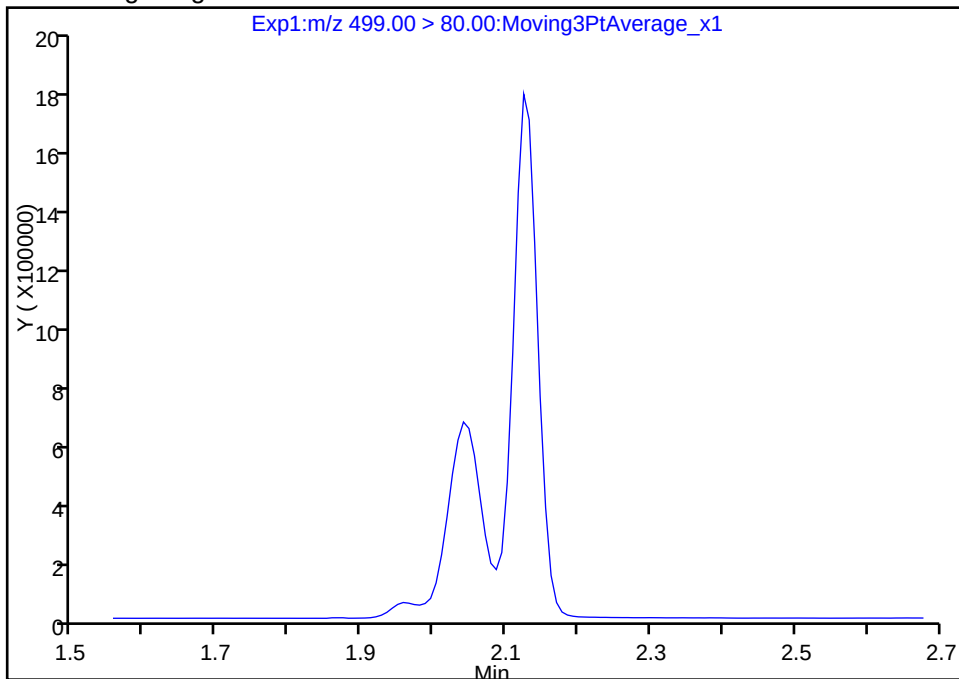
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_017.d  
Injection Date: 13-Nov-2017 03:38:02 Instrument ID: A8\_N  
Lims ID: CCV L5  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 14  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

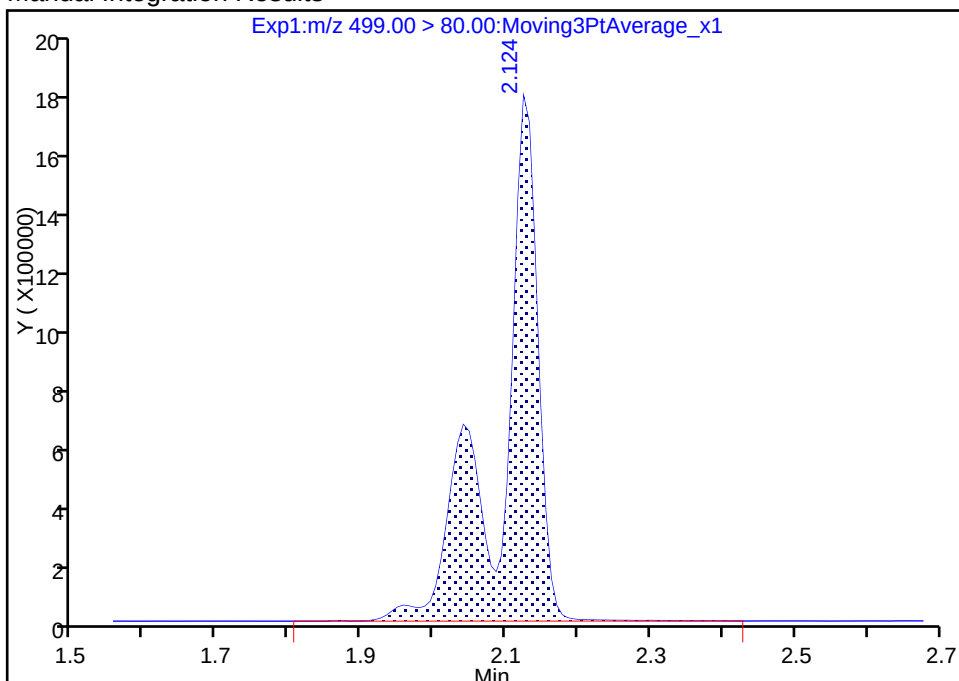
Not Detected  
Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results

RT: 2.12  
Area: 6381441  
Amount: 60.993170  
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:02:01

Audit Action: Manually Integrated

Audit Reason: Missed Peak

## TestAmerica Sacramento

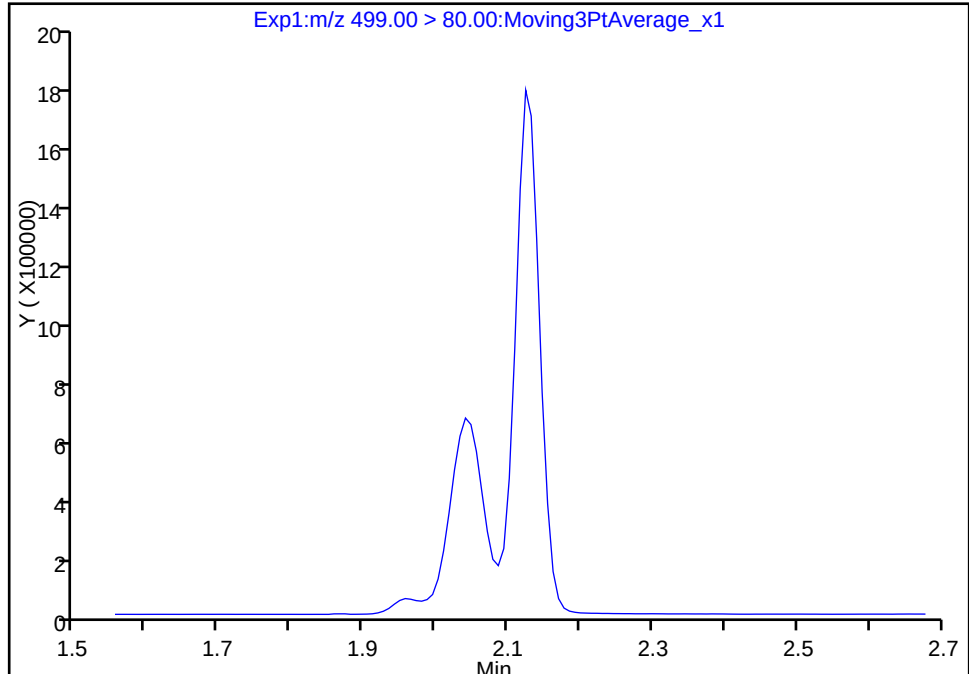
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_017.d  
Injection Date: 13-Nov-2017 03:38:02 Instrument ID: A8\_N  
Lims ID: CCV L5  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 14  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

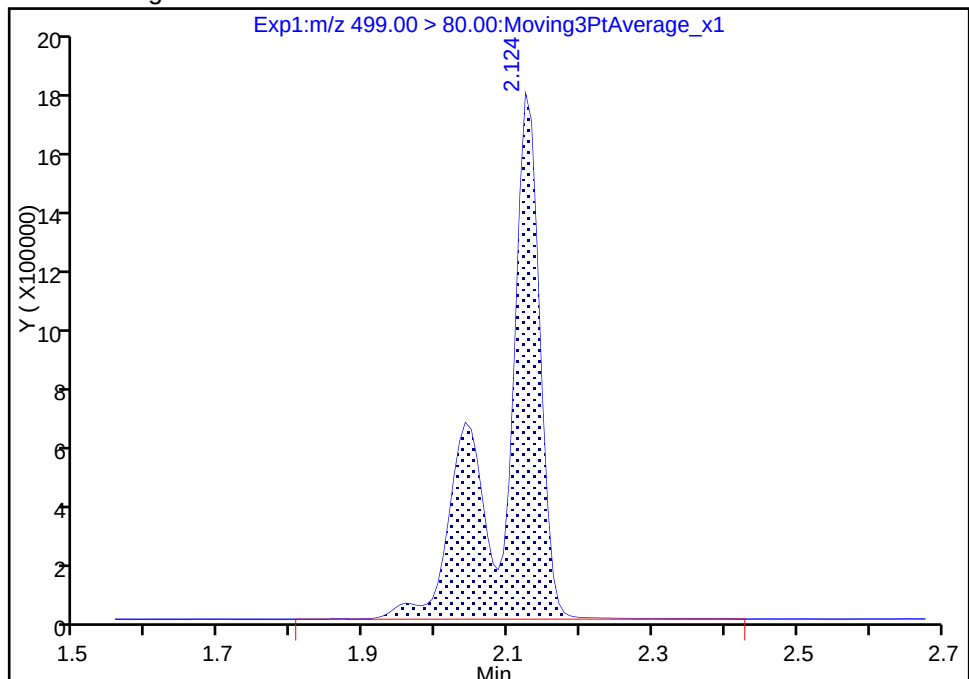
Not Detected  
Expected RT: 2.12

## Processing Integration Results



RT: 2.12  
Area: 6381441  
Amount: 60.993170  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: barnettj, 14-Nov-2017 17:01:48  
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

## TestAmerica Sacramento

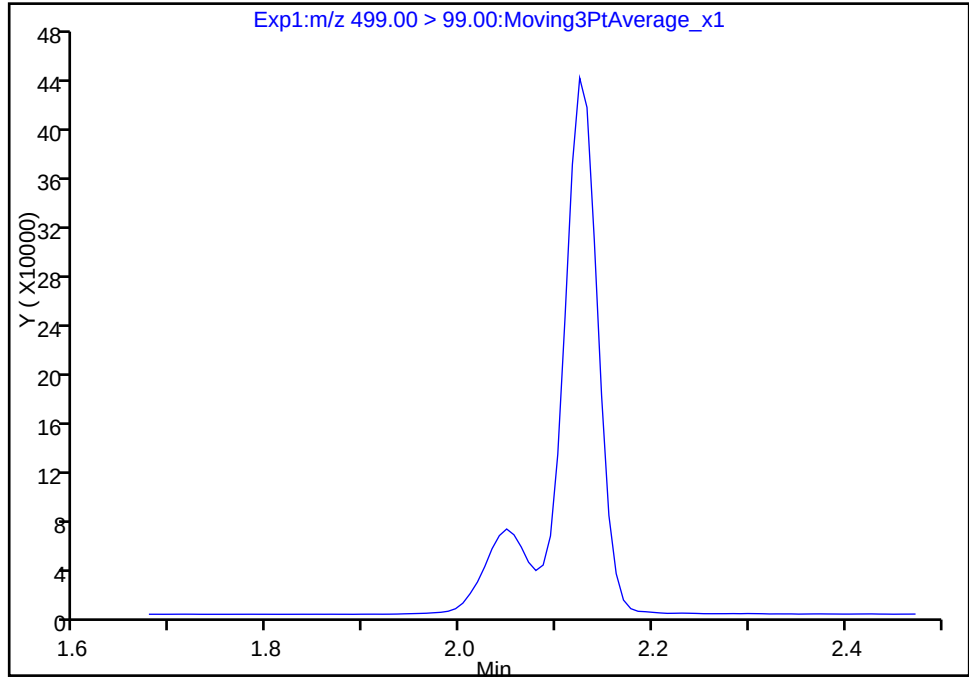
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_017.d  
Injection Date: 13-Nov-2017 03:38:02 Instrument ID: A8\_N  
Lims ID: CCV L5  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 14  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 2

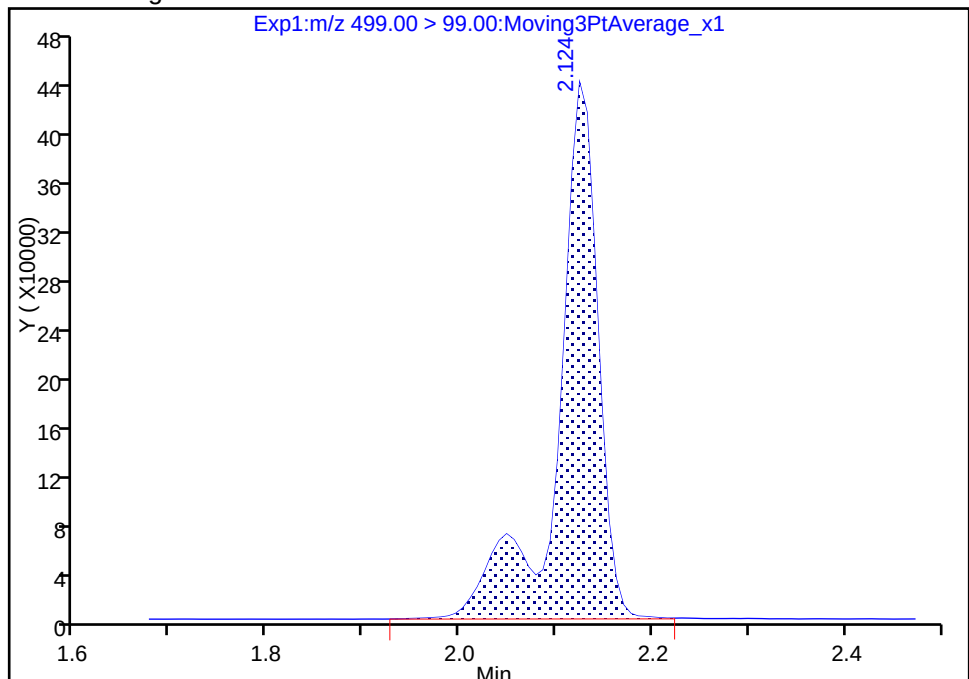
Not Detected  
Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results

RT: 2.12  
Area: 1286454  
Amount: 60.993170  
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:02:01

Audit Action: Manually Integrated

Audit Reason: Missed Peak

## TestAmerica Sacramento

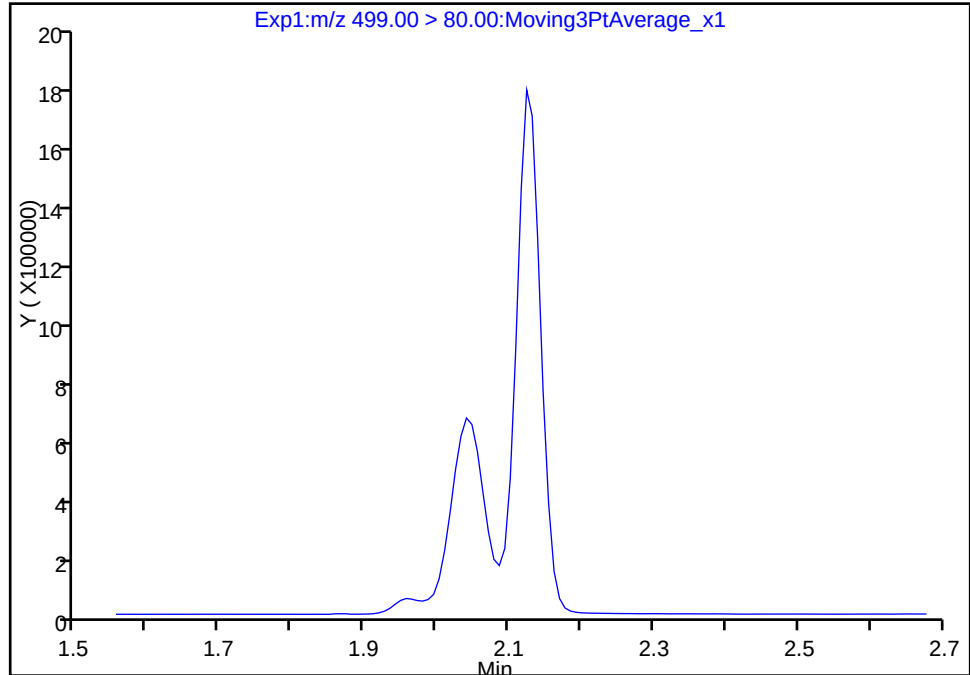
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_017.d  
Injection Date: 13-Nov-2017 03:38:02 Instrument ID: A8\_N  
Lims ID: CCV L5  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 14  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

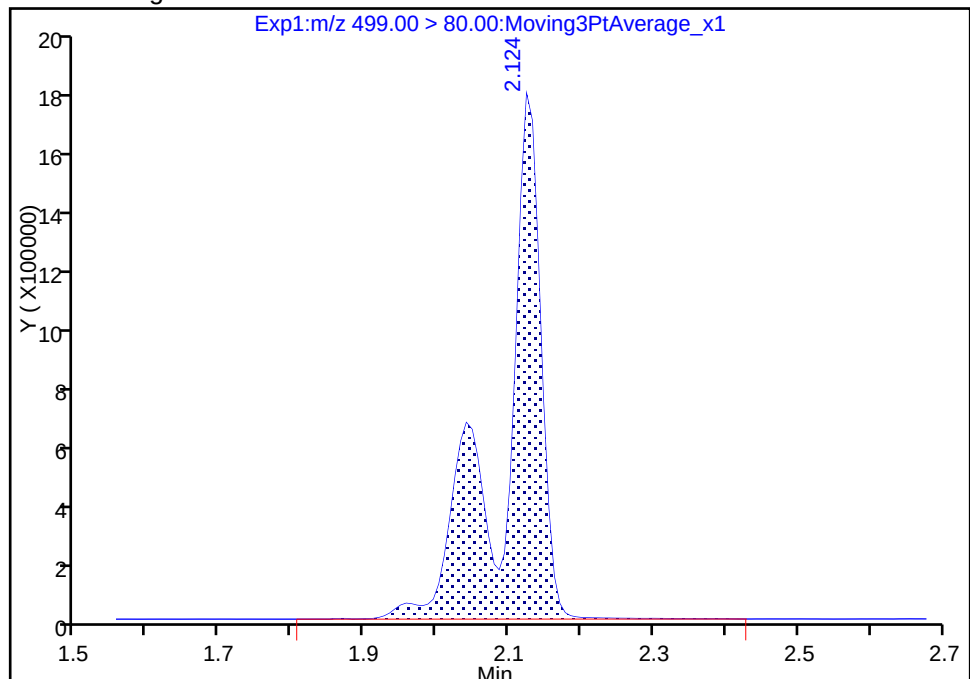
Not Detected  
Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results

RT: 2.12  
Area: 6381441  
Amount: 60.993170  
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 17:02:01

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-194251/25 Calibration Date: 11/13/2017 04:29  
 Instrument ID: A8\_N Calib Start Date: 11/03/2017 13:37  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01  
 Lab File ID: 2017.11.13\_537A\_028.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | QuaF          |         | 1.109  |         | 47.6           | 45.0            | 5.8  | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 0.9369  | 0.8978 |         | 4.79           | 5.00            | -4.2 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.674   | 1.698  |         | 15.2           | 15.0            | 1.4  | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 0.9258  | 0.9001 |         | 9.73           | 10.0            | -2.8 | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 0.9389  | 0.9068 |         | 19.3           | 20.0            | -3.4 | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.6642  | 0.6547 |         | 9.86           | 10.0            | -1.4 | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.061  |         | 9.65           | 10.0            | -3.5 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.7652  | 0.7009 |         | 9.16           | 10.0            | -8.4 | 30.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_028.d  
 Lims ID: CCV L3  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 13-Nov-2017 04:29:32 ALS Bottle#: 3 Worklist Smp#: 25  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L3  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:12:15 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

First Level Reviewer: barnettj Date: 14-Nov-2017 17:05:45

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N  | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |      |       |
| 298.90 > 80.00                  | 1.426 | 1.444  | -0.018 | 1.000  | 5523142  | 47.6         |                 | 2784 |       |
| 298.90 > 99.00                  | 1.426 | 1.444  | -0.018 | 1.000  | 3803850  |              | 1.45(0.00-0.00) | 9282 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |      |       |
| 315.00 > 270.00                 | 1.555 | 1.573  | -0.018 | 1.000  | 1641416  | 9.65         |                 | 7335 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |      |       |
| 399.00 > 80.00                  | 1.699 | 1.725  | -0.026 | 1.000  | 2820355  | 15.2         |                 | 3429 |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |      |       |
| 363.00 > 319.00                 | 1.699 | 1.725  | -0.026 | 1.000  | 694490   | 4.79         |                 | 216  |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |      |       |
| 415.00 > 370.00                 | 1.882 | 1.913  | -0.031 |        | 1546685  | 10.0         |                 | 5717 |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |      |       |
| 413.00 > 369.00                 | 1.882 | 1.914  | -0.032 | 1.000  | 1393279  | 9.73         |                 | 265  |       |
| 413.00 > 169.00                 | 1.882 | 1.914  | -0.032 | 1.000  | 746886   |              | 1.87(0.00-0.00) | 943  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |      |       |
| 499.00 > 80.00                  | 2.117 | 2.117  | 0.0    | 1.000  | 2008370  | 19.3         |                 | 1605 |       |
| 499.00 > 99.00                  | 2.117 | 2.117  | 0.0    | 1.000  | 423799   |              | 4.74(0.00-0.00) | 1021 |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |      |       |
| 503.00 > 80.00                  | 2.117 | 2.151  | -0.034 |        | 3175276  | 28.7         |                 | 4588 |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |      |       |
| 463.00 > 419.00                 | 2.124 | 2.158  | -0.034 | 1.000  | 1012826  | 9.86         |                 | 310  |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |      |       |
| 515.00 > 470.00                 | 2.291 | 2.312  | -0.021 | 1.000  | 1084053  | 9.16         |                 | 6672 |       |

**Reagents:**

LC537-L3\_00023

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_028.d

Injection Date: 13-Nov-2017 04:29:32

Instrument ID: A8\_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 25

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

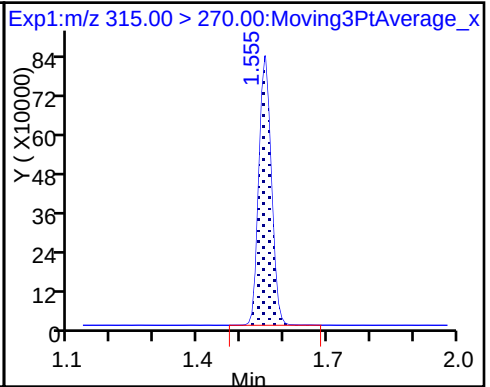
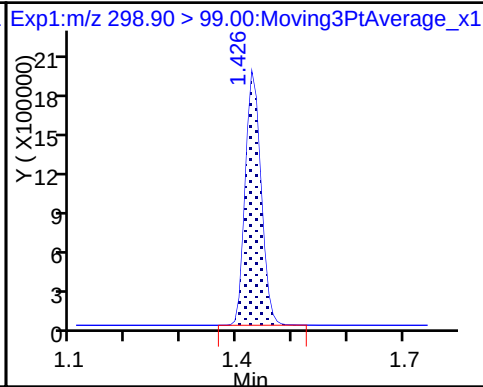
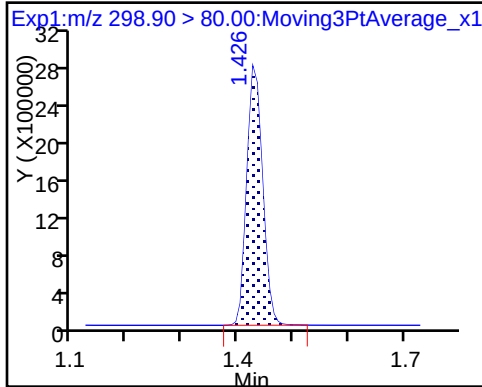
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

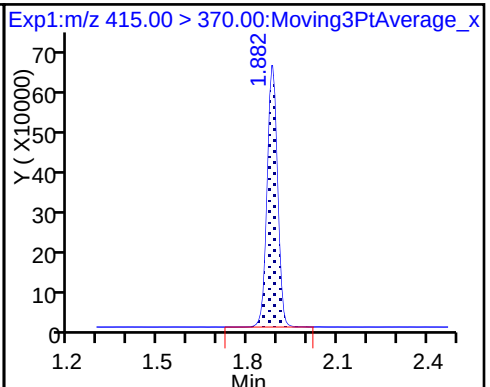
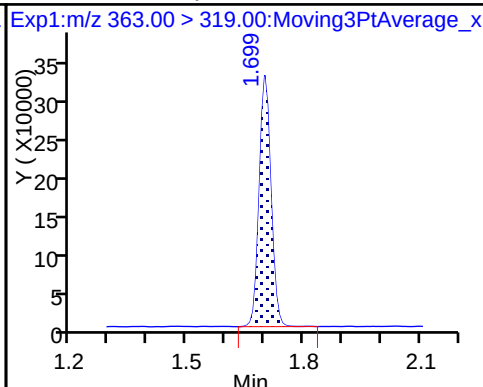
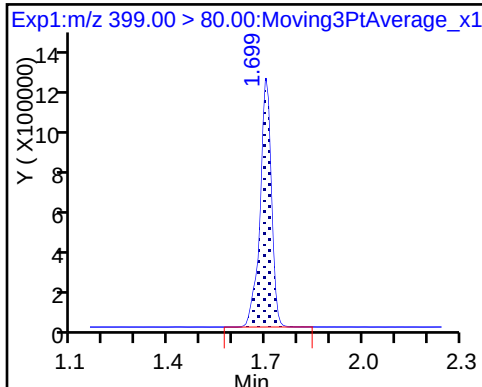
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

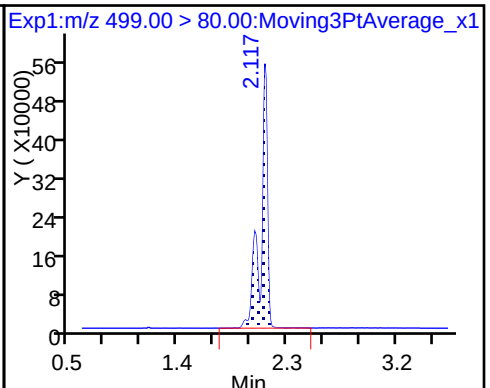
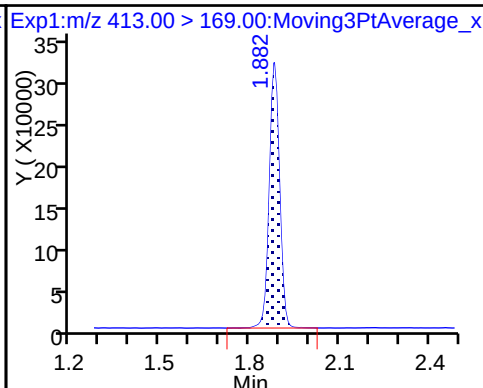
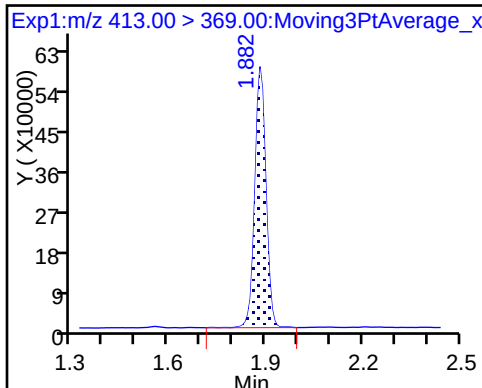
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

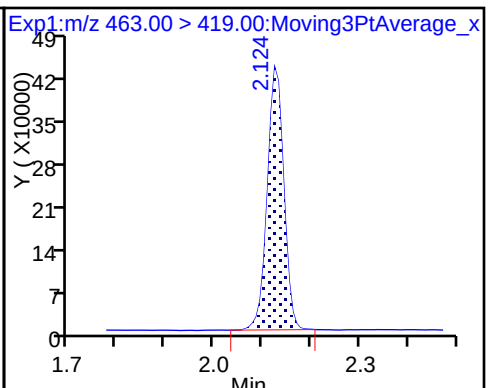
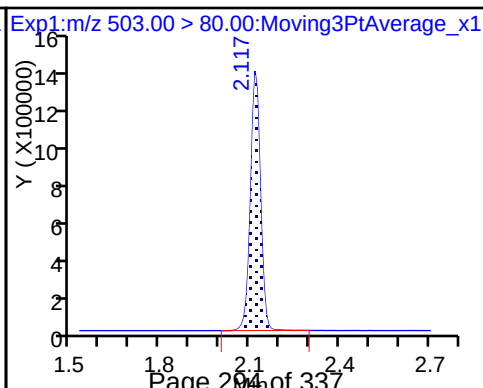
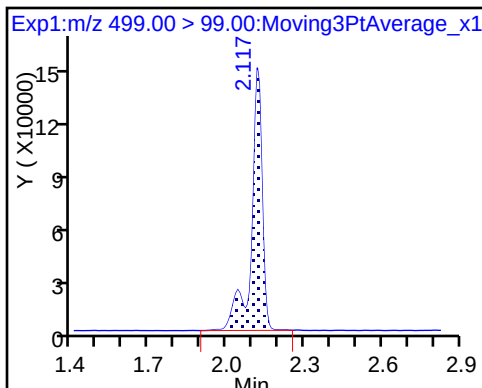
8 Perfluorooctane sulfonic acid



8 Perfluorooctane sulfonic acid

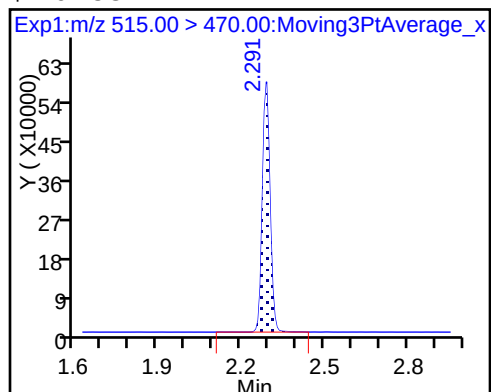
\* 7 13C4 PFOS

9 Perfluorononanoic acid





\$ 10 13C2 PFDA



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: MB 320-193512/1-A  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_007.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 250.00 (mL) Date Analyzed: 11/13/2017 02:51  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194241 Units: ng/L

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

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 85   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 91   |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_007.d  
 Lims ID: MB 320-193512/1-A  
 Client ID:  
 Sample Type: MB  
 Inject. Date: 13-Nov-2017 02:51:14 ALS Bottle#: 1 Worklist Smp#: 4  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: mb 320-193512/1-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

| Signal          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits) | S/N  | Flags |
|-----------------|-------|-----------|-----------|-----------|----------|-----------------|---------------|------|-------|
| \$ 2 13C2 PFHxA |       |           |           |           |          |                 |               |      |       |
| 315.00 > 270.00 | 1.563 | 1.573     | -0.010    | 1.000     | 1499346  | 8.55            |               | 6181 |       |
| * 6 13C2-PFOA   |       |           |           |           |          |                 |               |      |       |
| 415.00 > 370.00 | 1.897 | 1.913     | -0.016    |           | 1594024  | 10.0            |               | 5883 |       |
| * 7 13C4 PFOS   |       |           |           |           |          |                 |               |      |       |
| 503.00 > 80.00  | 2.132 | 2.151     | -0.019    |           | 3183489  | 28.7            |               | 4277 |       |
| \$ 10 13C2 PFDA |       |           |           |           |          |                 |               |      |       |
| 515.00 > 470.00 | 2.299 | 2.312     | -0.013    | 1.000     | 1111328  | 9.11            |               | 7083 |       |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_007.d

Injection Date: 13-Nov-2017 02:51:14

Instrument ID: A8\_N

Lims ID: MB 320-193512/1-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 1

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

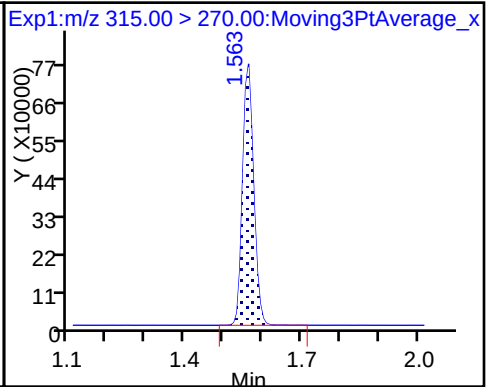
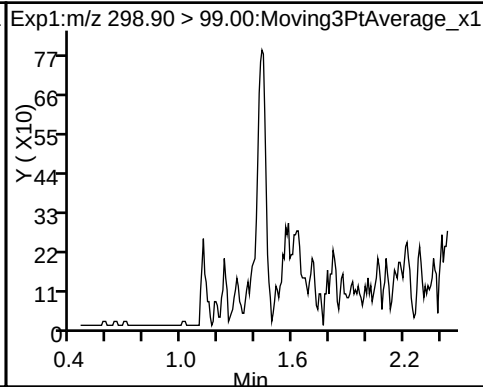
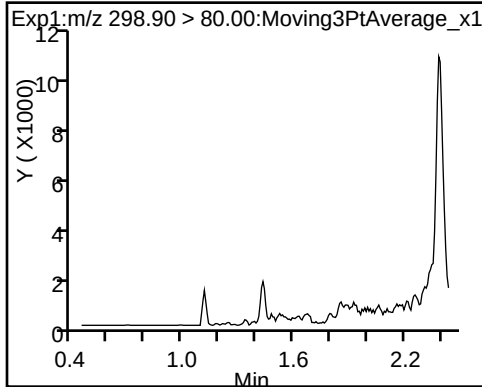
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

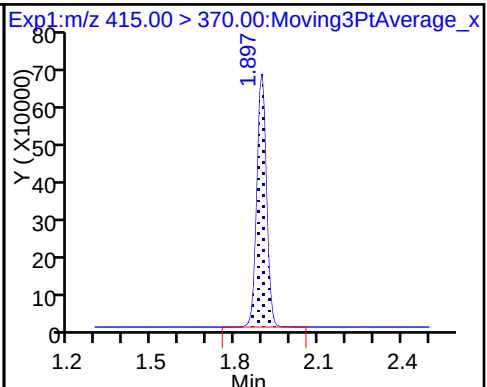
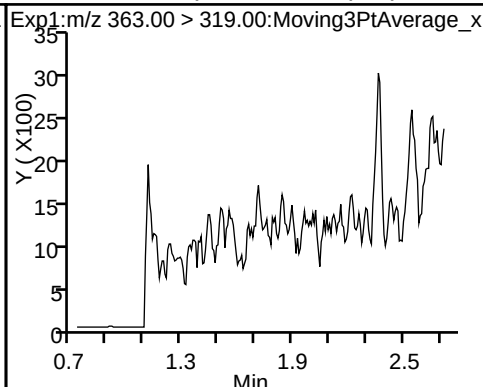
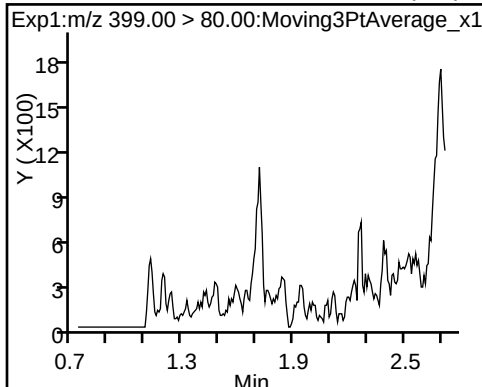
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

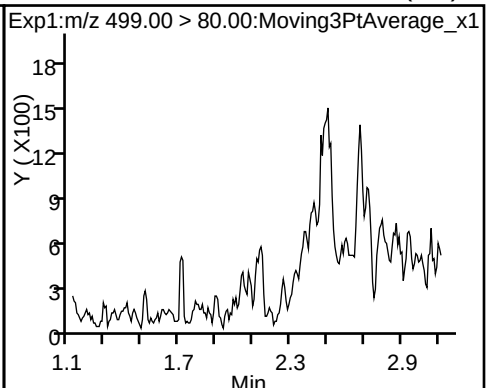
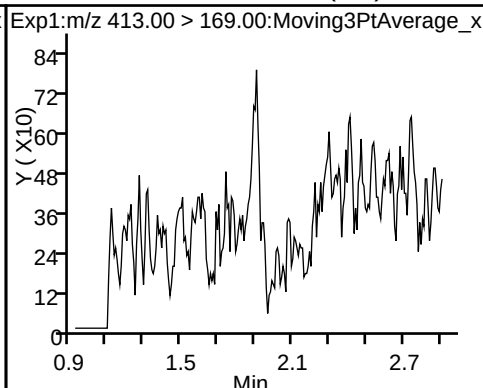
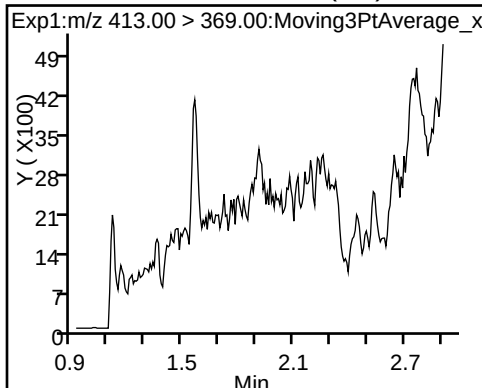
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

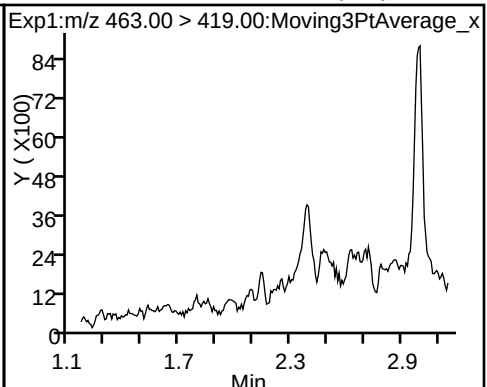
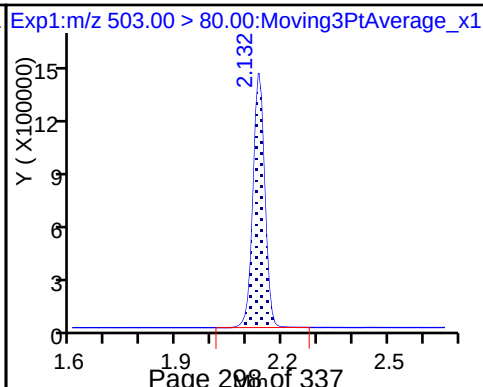
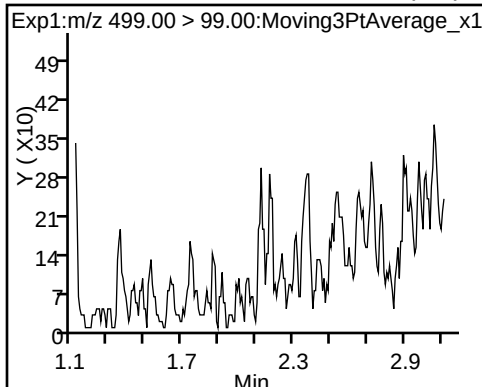
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

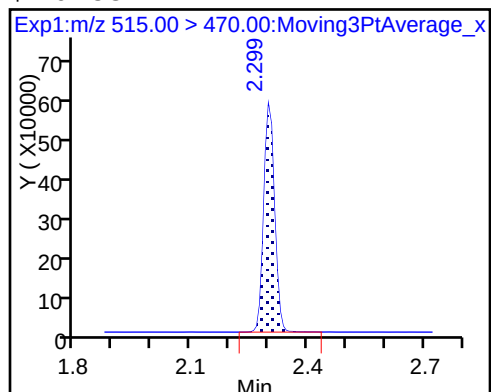


8 Perfluorooctane sulfonic acid (ND) \* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_007.d  
Lims ID: MB 320-193512/1-A  
Client ID:  
Sample Type: MB  
Inject. Date: 13-Nov-2017 02:51:14 ALS Bottle#: 1 Worklist Smp#: 4  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: mb 320-193512/1-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK010

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.55             | 85.49  |
| \$ 10 13C2 PFDA | 10.0         | 9.11             | 91.11  |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: LCS 320-193512/2-A  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_008.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 250.00 (mL) Date Analyzed: 11/13/2017 02:55  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194241 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 210    | M | 40  | 16  | 6.8 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 105    |   | 20  | 8.0 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 103    |   | 24  | 20  | 8.0 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 165    |   | 30  | 12  | 5.5 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 51.7   |   | 10  | 4.0 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 473    |   | 90  | 36  | 16  |

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_008.d  
 Lims ID: LCS 320-193512/2-A  
 Client ID:  
 Sample Type: LCS  
 Inject. Date: 13-Nov-2017 02:55:55 ALS Bottle#: 2 Worklist Smp#: 5  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: lcs 320-193512/2-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 16:56:27

| Signal                          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 298.90 > 80.00                  | 1.426 | 1.444     | -0.018    | 1.000     | 12297786 | 118.2           |                 | 5614  |       |
| 298.90 > 99.00                  | 1.426 | 1.444     | -0.018    | 1.000     | 9322484  |                 | 1.32(0.00-0.00) | 15946 |       |
| \$ 2 13C2 PFHxA                 |       |           |           |           |          |                 |                 |       |       |
| 315.00 > 270.00                 | 1.555 | 1.573     | -0.018    | 1.000     | 1565932  | 8.87            |                 | 5699  |       |
| 3 Perfluorohexanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 399.00 > 80.00                  | 1.699 | 1.725     | -0.026    | 1.000     | 7607656  | 41.2            |                 | 5926  |       |
| 4 Perfluoroheptanoic acid       |       |           |           |           |          |                 |                 |       |       |
| 363.00 > 319.00                 | 1.699 | 1.725     | -0.026    | 1.000     | 1943854  | 12.9            |                 | 610   |       |
| * 6 13C2-PFOA                   |       |           |           |           |          |                 |                 |       |       |
| 415.00 > 370.00                 | 1.889 | 1.913     | -0.024    |           | 1604626  | 10.0            |                 | 5227  |       |
| 5 Perfluorooctanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 413.00 > 369.00                 | 1.889 | 1.914     | -0.025    | 1.000     | 3891897  | 26.2            |                 | 750   |       |
| 413.00 > 169.00                 | 1.889 | 1.914     | -0.025    | 1.000     | 2046551  |                 | 1.90(0.00-0.00) | 2208  |       |
| 8 Perfluorooctane sulfonic acid |       |           |           |           |          |                 |                 |       |       |
| 499.00 > 80.00                  | 2.124 | 2.117     | 0.007     | 1.000     | 5449359  | 52.6            |                 | 4008  | M     |
| 499.00 > 99.00                  | 2.124 | 2.117     | 0.007     | 1.000     | 1143860  |                 | 4.76(0.00-0.00) | 2211  | M     |
| * 7 13C4 PFOS                   |       |           |           |           |          |                 |                 |       |       |
| 503.00 > 80.00                  | 2.124 | 2.151     | -0.027    |           | 3166909  | 28.7            |                 | 4491  |       |
| 9 Perfluorononanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 463.00 > 419.00                 | 2.132 | 2.158     | -0.026    | 1.000     | 2755343  | 25.9            |                 | 856   |       |
| \$ 10 13C2 PFDA                 |       |           |           |           |          |                 |                 |       |       |
| 515.00 > 470.00                 | 2.291 | 2.312     | -0.021    | 1.000     | 1068735  | 8.70            |                 | 7608  |       |



## QC Flag Legend

### Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_008.d

Injection Date: 13-Nov-2017 02:55:55

Instrument ID: A8\_N

Lims ID: LCS 320-193512/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

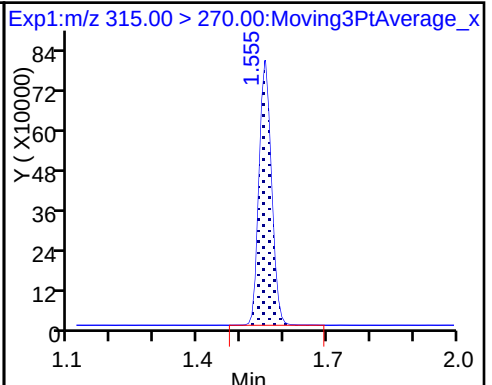
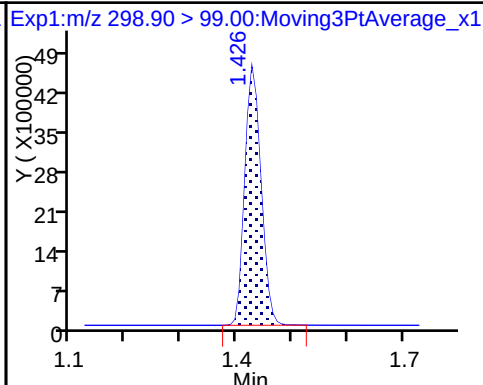
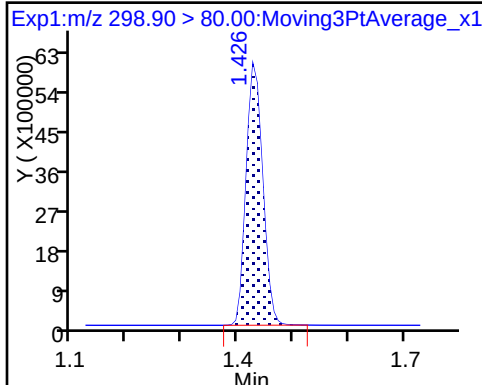
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

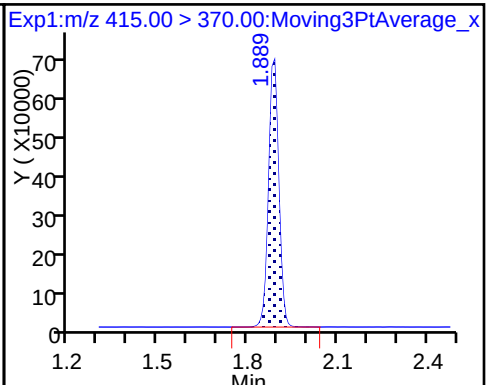
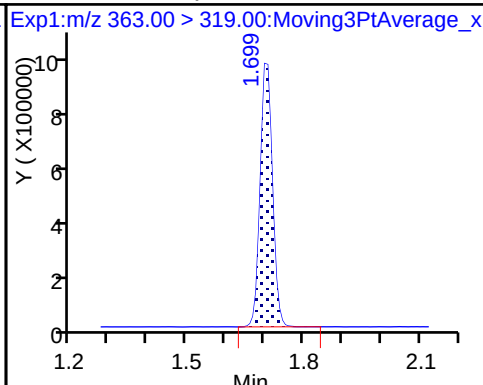
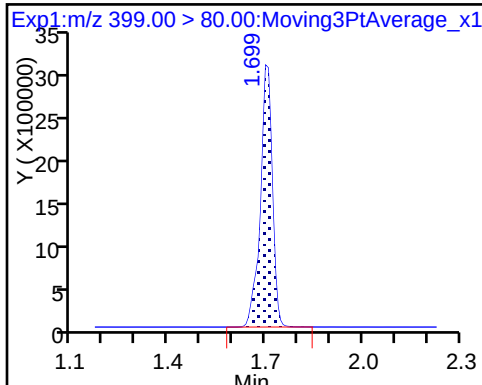
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

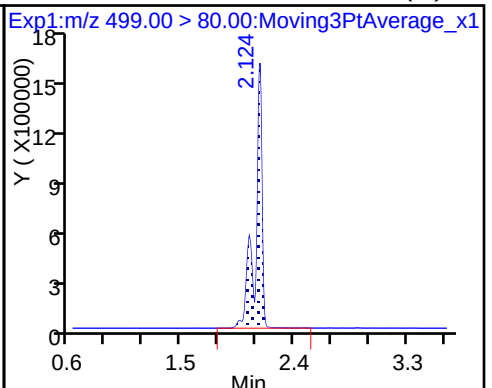
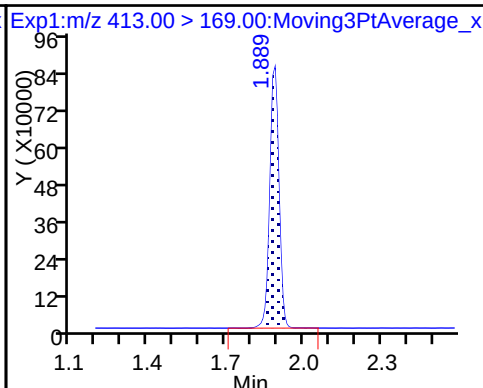
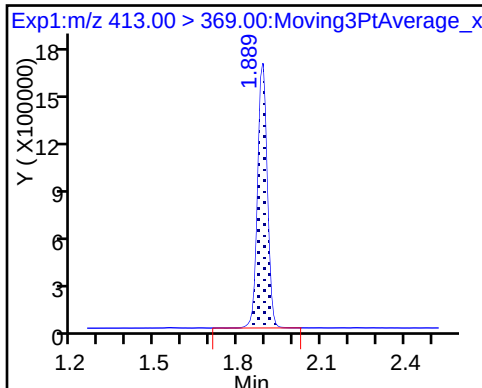
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

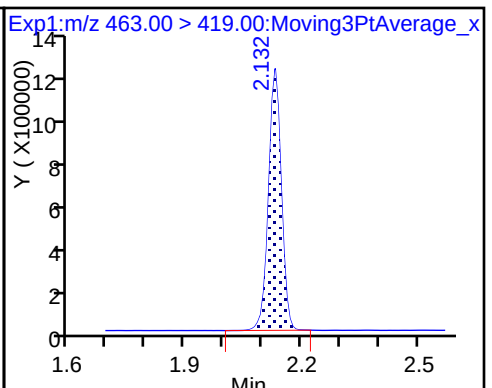
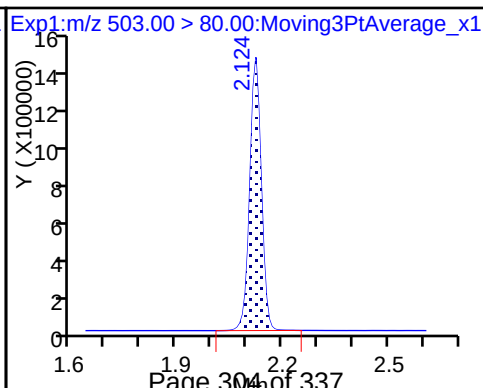
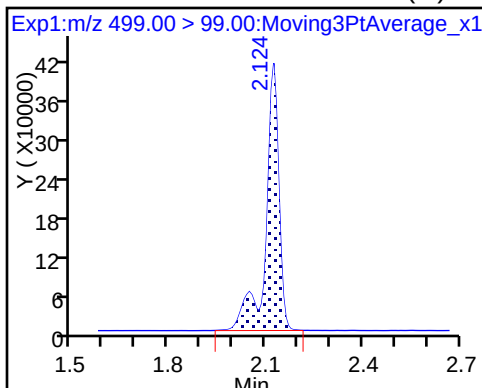
8 Perfluorooctane sulfonic acid (M)



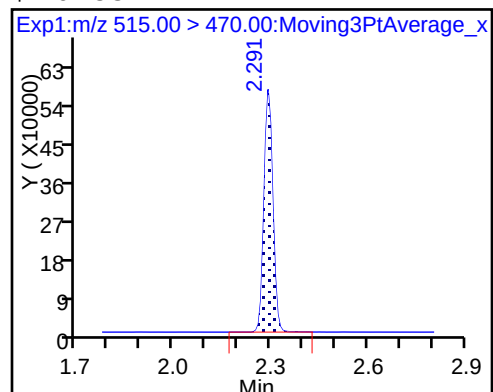
8 Perfluorooctane sulfonic acid (M)

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_008.d  
Lims ID: LCS 320-193512/2-A  
Client ID:  
Sample Type: LCS  
Inject. Date: 13-Nov-2017 02:55:55 ALS Bottle#: 2 Worklist Smp#: 5  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: lcs 320-193512/2-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
Column 1 : Det: EXP1  
Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 16:56:27

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.87             | 88.69  |
| \$ 10 13C2 PFDA | 10.0         | 8.70             | 87.04  |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_008.d

Injection Date: 13-Nov-2017 02:55:55

Instrument ID: A8\_N

Lims ID: LCS 320-193512/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#:

2

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537\_A8\_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

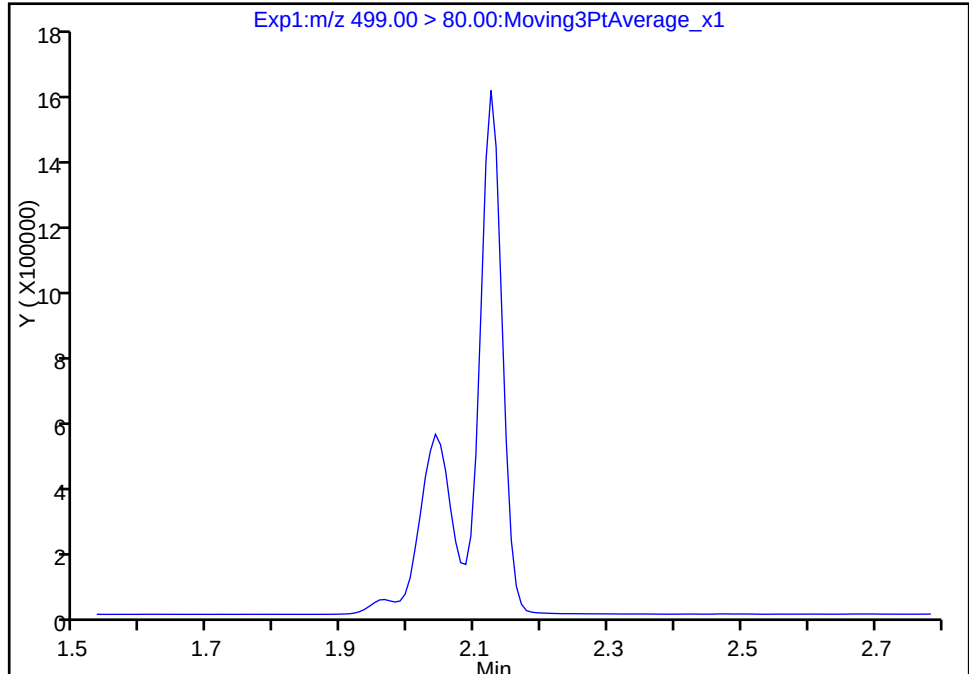
**8 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

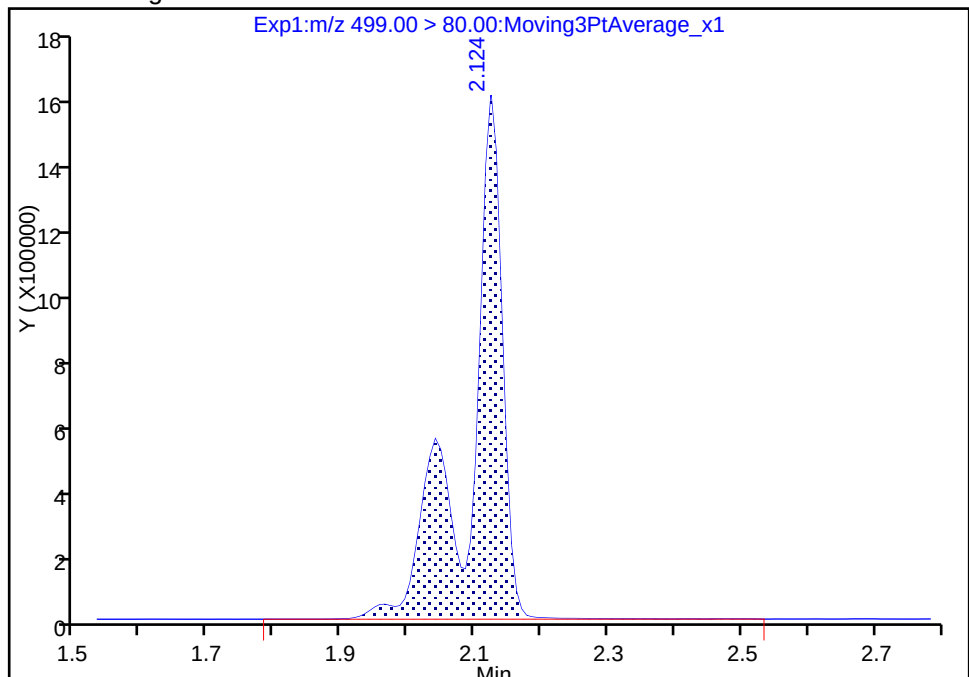
Not Detected

Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results



RT: 2.12

Area: 5449359

Amount: 52.559003

Amount Units: ng/ml

Reviewer: barnettj, 14-Nov-2017 16:55:54

Audit Action: Assigned Compound ID

Audit Reason: Isomers

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_008.d

Injection Date: 13-Nov-2017 02:55:55

Instrument ID: A8\_N

Lims ID: LCS 320-193512/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#:

2

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537\_A8\_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

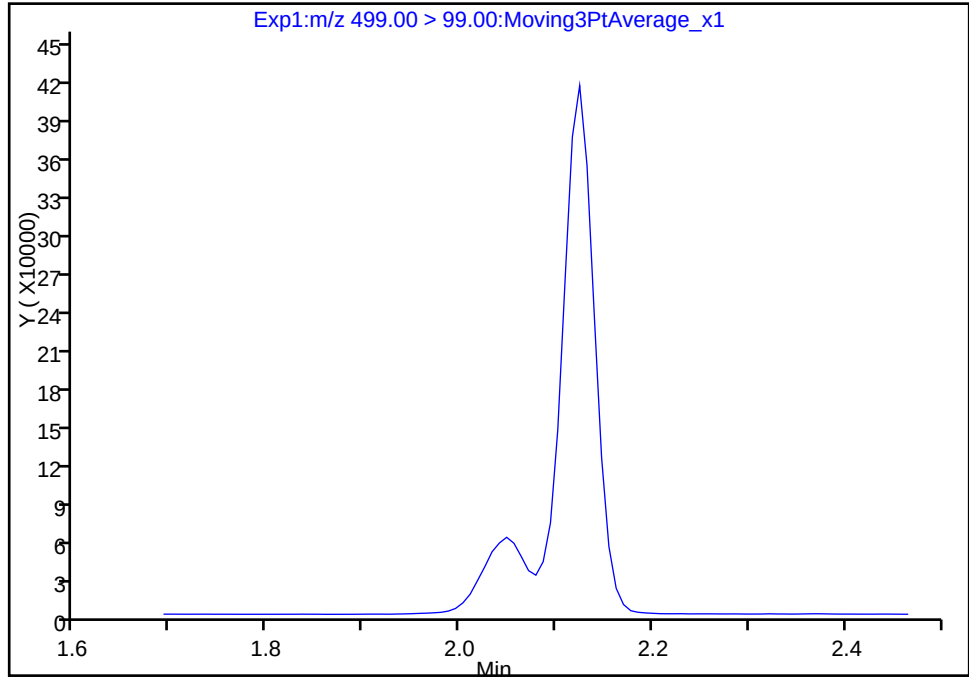
**8 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 2

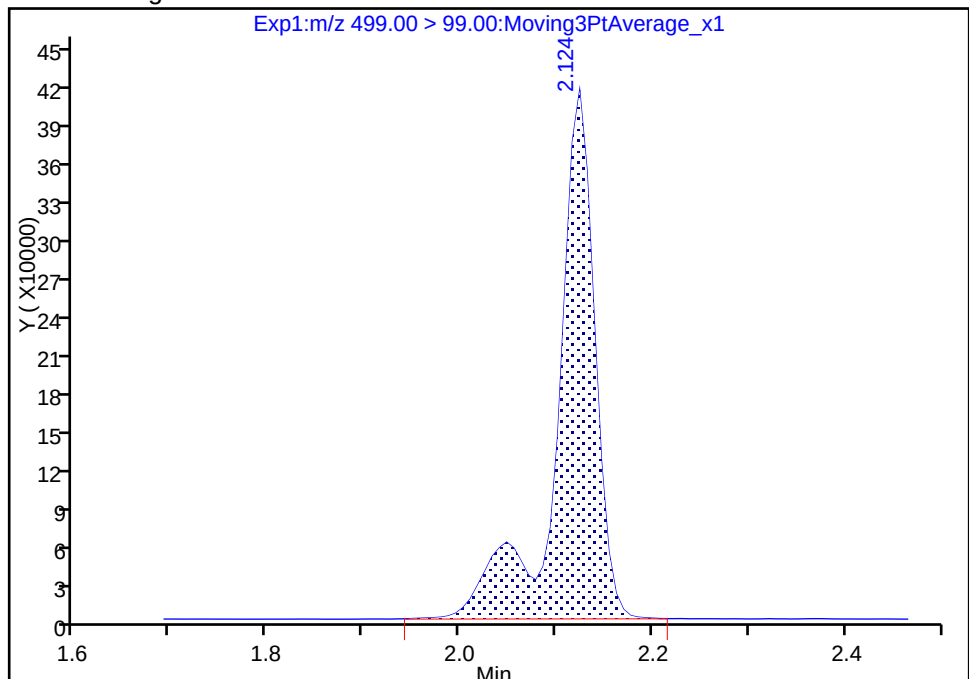
Not Detected

Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results



RT: 2.12

Area: 1143860

Amount: 52.559003

Amount Units: ng/ml

Reviewer: barnettj, 14-Nov-2017 16:56:07

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_008.d

Injection Date: 13-Nov-2017 02:55:55

Instrument ID: A8\_N

Lims ID: LCS 320-193512/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#:

2

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537\_A8\_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

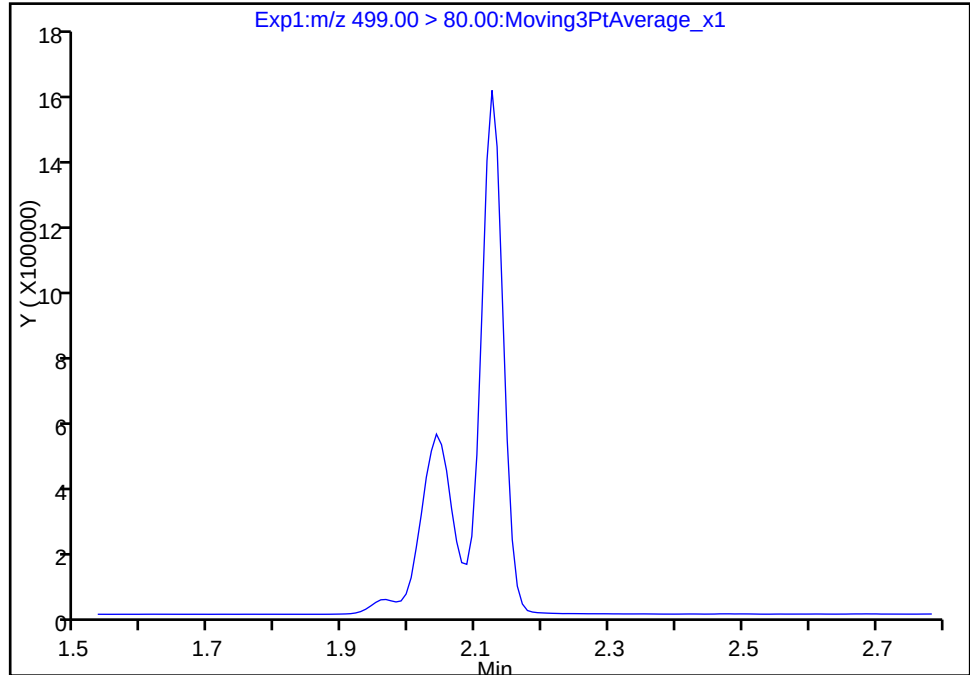
## 8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

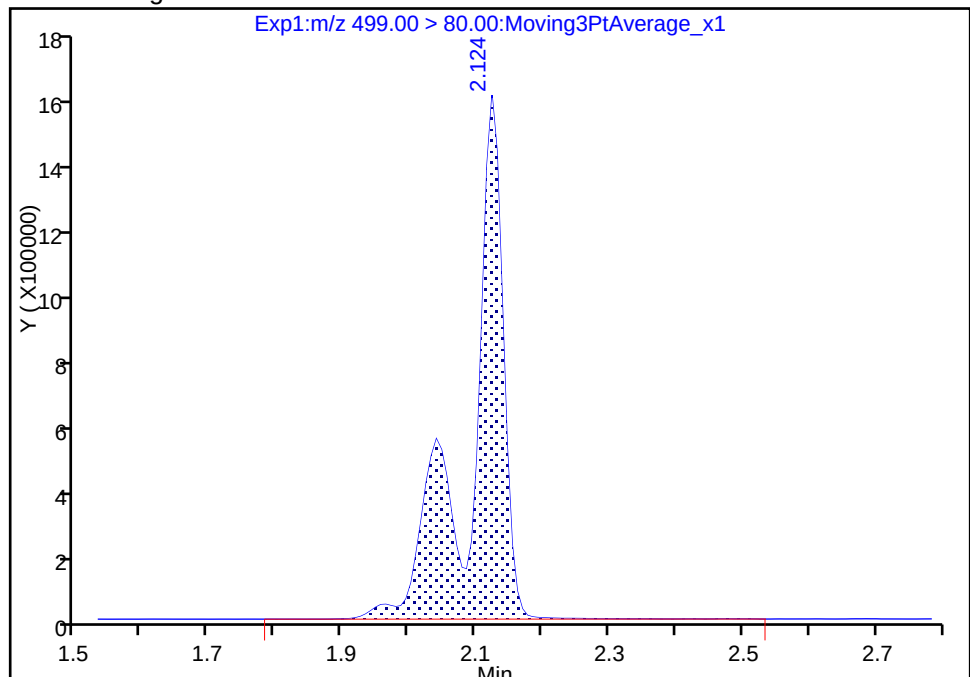
Not Detected

Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results

RT: 2.12  
Area: 5449359  
Amount: 52.559003  
Amount Units: ng/ml

Reviewer: barnettj, 14-Nov-2017 16:56:07

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: LCSD 320-193512/3-A  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_009.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 250.00 (mL) Date Analyzed: 11/13/2017 03:00  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194241 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 215    | M | 40  | 16  | 6.8 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 103    |   | 20  | 8.0 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 106    |   | 24  | 20  | 8.0 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 169    |   | 30  | 12  | 5.5 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 52.2   |   | 10  | 4.0 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 480    |   | 90  | 36  | 16  |

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



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_009.d  
 Lims ID: LCSD 320-193512/3-A  
 Client ID:  
 Sample Type: LCSD  
 Inject. Date: 13-Nov-2017 03:00:36 ALS Bottle#: 3 Worklist Smp#: 6  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: lcsd 320-193512/3-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 16:57:05

| Signal                          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 298.90 > 80.00                  | 1.426 | 1.444     | -0.018    | 1.000     | 12269989 | 119.9           |                 | 5532  |       |
| 298.90 > 99.00                  | 1.426 | 1.444     | -0.018    | 1.000     | 9164403  |                 | 1.34(0.00-0.00) | 14563 |       |
| \$ 2 13C2 PFHxA                 |       |           |           |           |          |                 |                 |       |       |
| 315.00 > 270.00                 | 1.555 | 1.573     | -0.018    | 1.000     | 1550432  | 8.66            |                 | 6396  |       |
| 3 Perfluorohexanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 399.00 > 80.00                  | 1.707 | 1.725     | -0.018    | 1.000     | 7713481  | 42.3            |                 | 7682  |       |
| 4 Perfluoroheptanoic acid       |       |           |           |           |          |                 |                 |       |       |
| 363.00 > 319.00                 | 1.707 | 1.725     | -0.018    | 1.000     | 1987692  | 13.0            |                 | 638   |       |
| * 6 13C2-PFOA                   |       |           |           |           |          |                 |                 |       |       |
| 415.00 > 370.00                 | 1.889 | 1.913     | -0.024    |           | 1626963  | 10.0            |                 | 5891  |       |
| 5 Perfluorooctanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 413.00 > 369.00                 | 1.889 | 1.914     | -0.025    | 1.000     | 3886519  | 25.8            |                 | 800   |       |
| 413.00 > 169.00                 | 1.889 | 1.914     | -0.025    | 1.000     | 2002386  |                 | 1.94(0.00-0.00) | 2252  |       |
| 8 Perfluorooctane sulfonic acid |       |           |           |           |          |                 |                 |       |       |
| 499.00 > 80.00                  | 2.124 | 2.117     | 0.007     | 1.000     | 5484877  | 53.6            |                 | 3673  | M     |
| 499.00 > 99.00                  | 2.124 | 2.117     | 0.007     | 1.000     | 1135675  |                 | 4.83(0.00-0.00) | 2298  | M     |
| * 7 13C4 PFOS                   |       |           |           |           |          |                 |                 |       |       |
| 503.00 > 80.00                  | 2.124 | 2.151     | -0.027    |           | 3122845  | 28.7            |                 | 4840  |       |
| 9 Perfluorononanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 463.00 > 419.00                 | 2.132 | 2.158     | -0.026    | 1.000     | 2863406  | 26.5            |                 | 855   |       |
| \$ 10 13C2 PFDA                 |       |           |           |           |          |                 |                 |       |       |
| 515.00 > 470.00                 | 2.291 | 2.312     | -0.021    | 1.000     | 1077067  | 8.65            |                 | 6513  |       |

## QC Flag Legend

### Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_009.d

Injection Date: 13-Nov-2017 03:00:36

Instrument ID: A8\_N

Lims ID: LCSD 320-193512/3-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

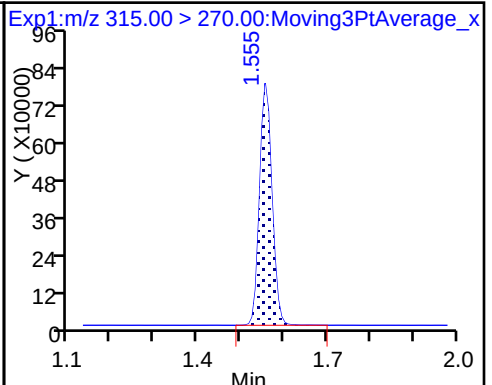
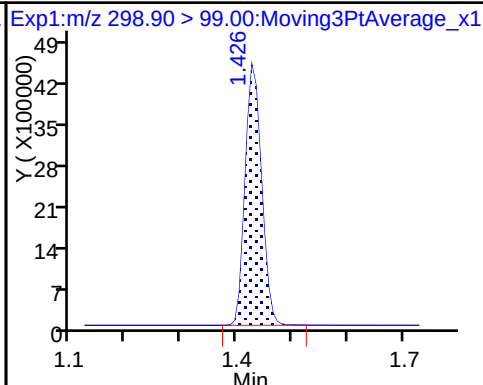
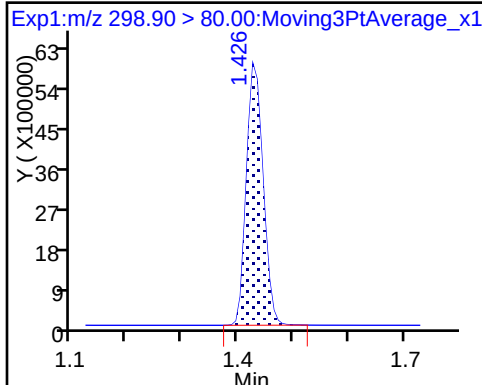
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

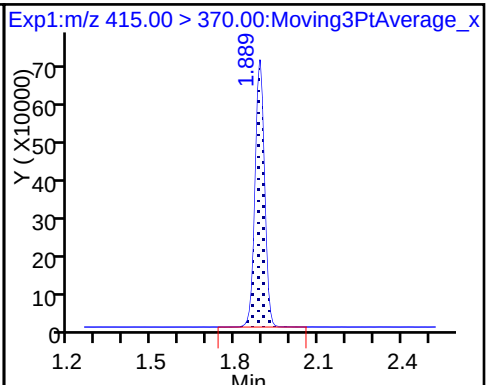
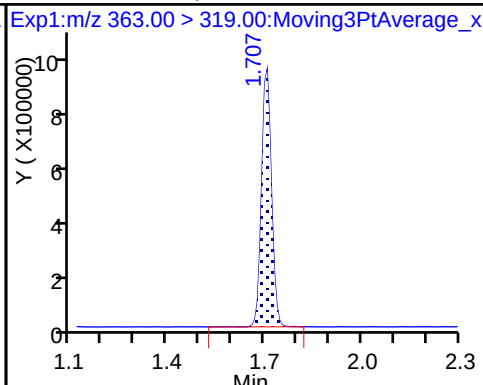
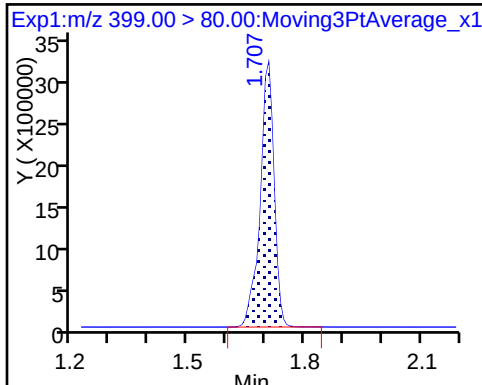
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

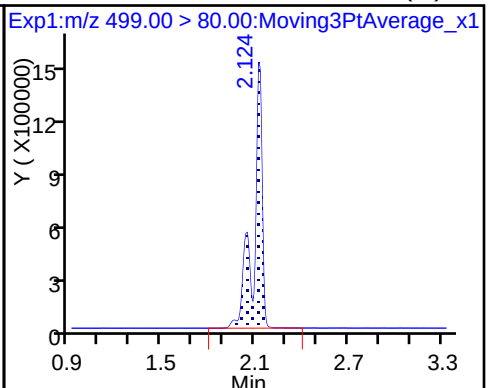
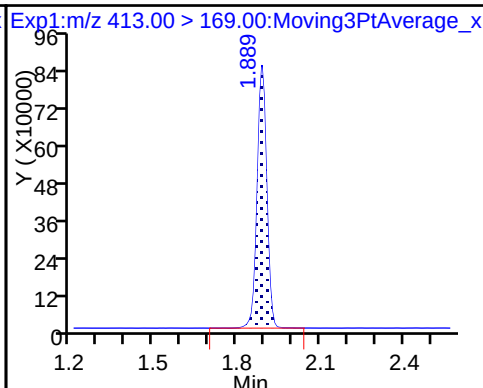
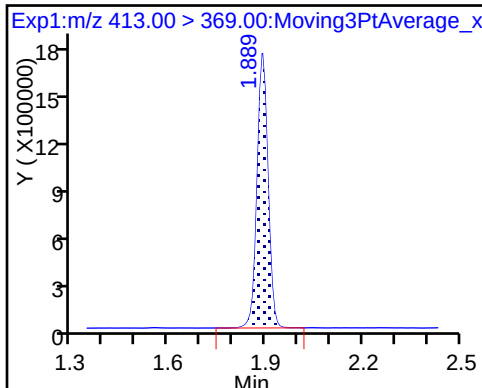
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

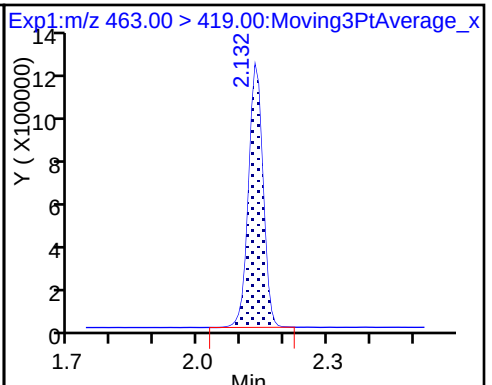
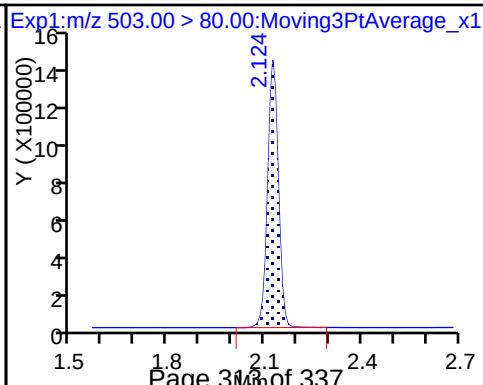
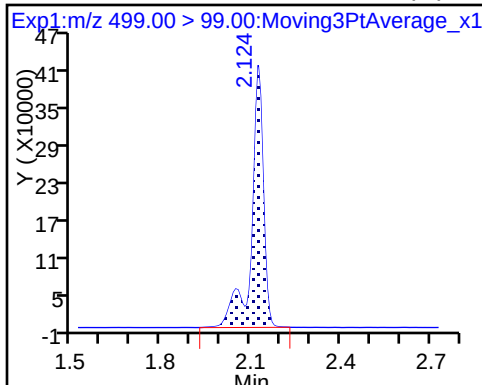
8 Perfluorooctane sulfonic acid (M)



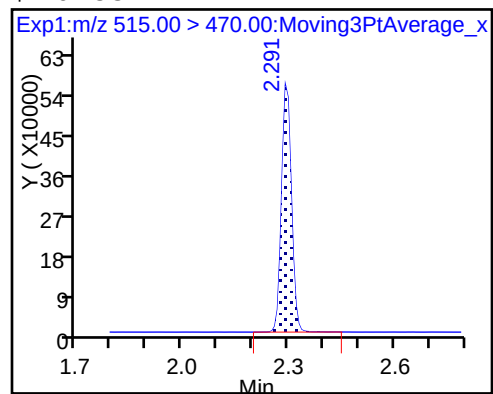
8 Perfluorooctane sulfonic acid (M)

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_009.d  
Lims ID: LCSD 320-193512/3-A  
Client ID:  
Sample Type: LCSD  
Inject. Date: 13-Nov-2017 03:00:36 ALS Bottle#: 3 Worklist Smp#: 6  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: lcsd 320-193512/3-a  
Misc. Info.: Plate: 1 Rack: 3  
Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 14-Nov-2017 17:11:56 Calib Date: 03-Nov-2017 14:01:24  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20171106-49975.b\2017.11.03\_537XICAL\_009.d  
Column 1 : Det: EXP1  
Process Host: XAWRK010

First Level Reviewer: barnettj

Date: 14-Nov-2017 16:57:05

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.66             | 86.61  |
| \$ 10 13C2 PFDA | 10.0         | 8.65             | 86.51  |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_009.d

Injection Date: 13-Nov-2017 03:00:36

Instrument ID: A8\_N

Lims ID: LCSD 320-193512/3-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#:

3

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537\_A8\_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

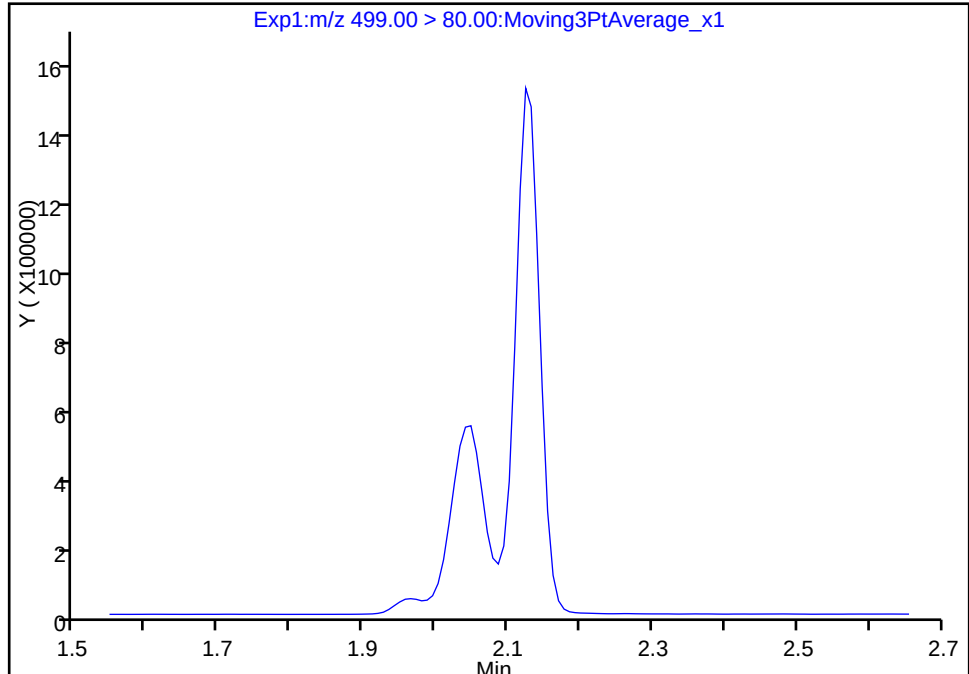
**8 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

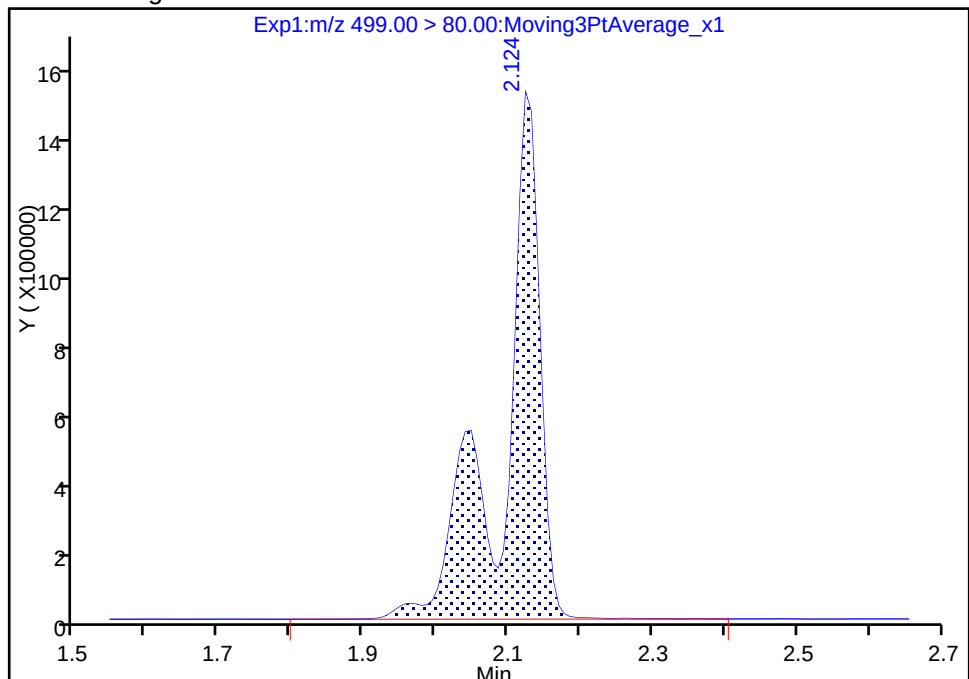
Not Detected

Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results



RT: 2.12

Area: 5484877

Amount: 53.648026

Amount Units: ng/ml

Reviewer: barnettj, 14-Nov-2017 16:56:34

Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_009.d

Injection Date: 13-Nov-2017 03:00:36

Instrument ID: A8\_N

Lims ID: LCSD 320-193512/3-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537\_A8\_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

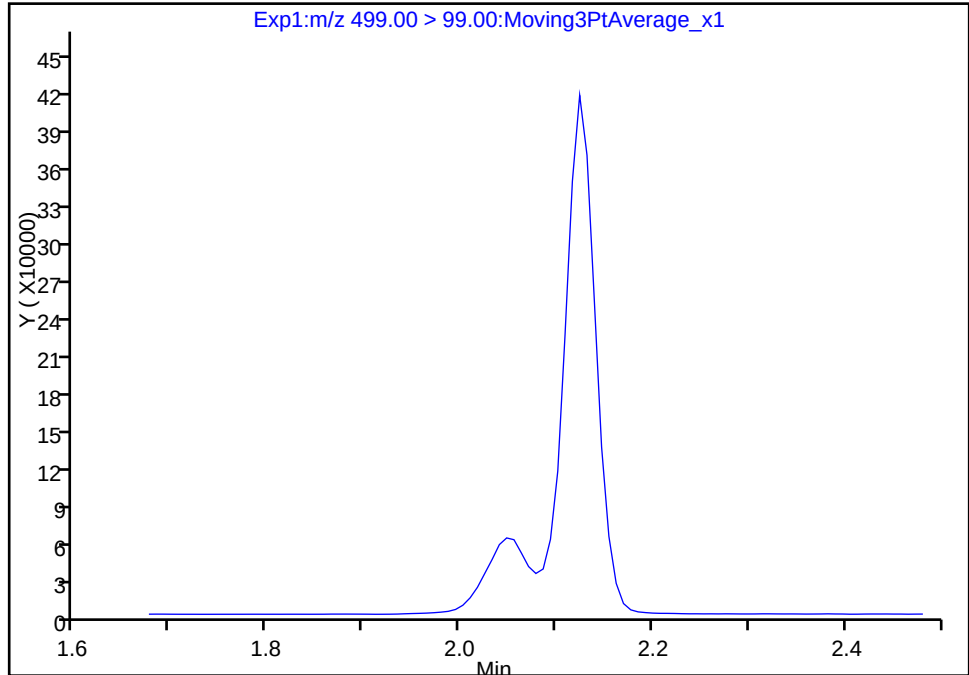
**8 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 2

Not Detected

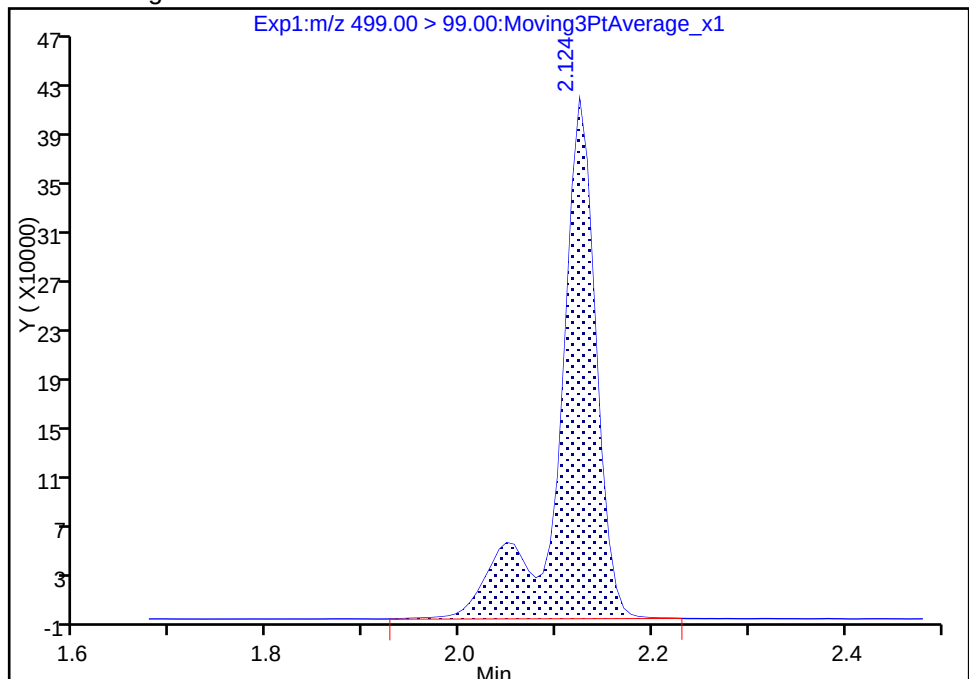
Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results

RT: 2.12  
Area: 1135675  
Amount: 53.648026  
Amount Units: ng/ml



Reviewer: barnettj, 14-Nov-2017 16:56:47

Audit Action: Manually Integrated

Audit Reason: Missed Peak

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b\2017.11.13\_537A\_009.d

Injection Date: 13-Nov-2017 03:00:36

Instrument ID: A8\_N

Lims ID: LCSD 320-193512/3-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537\_A8\_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

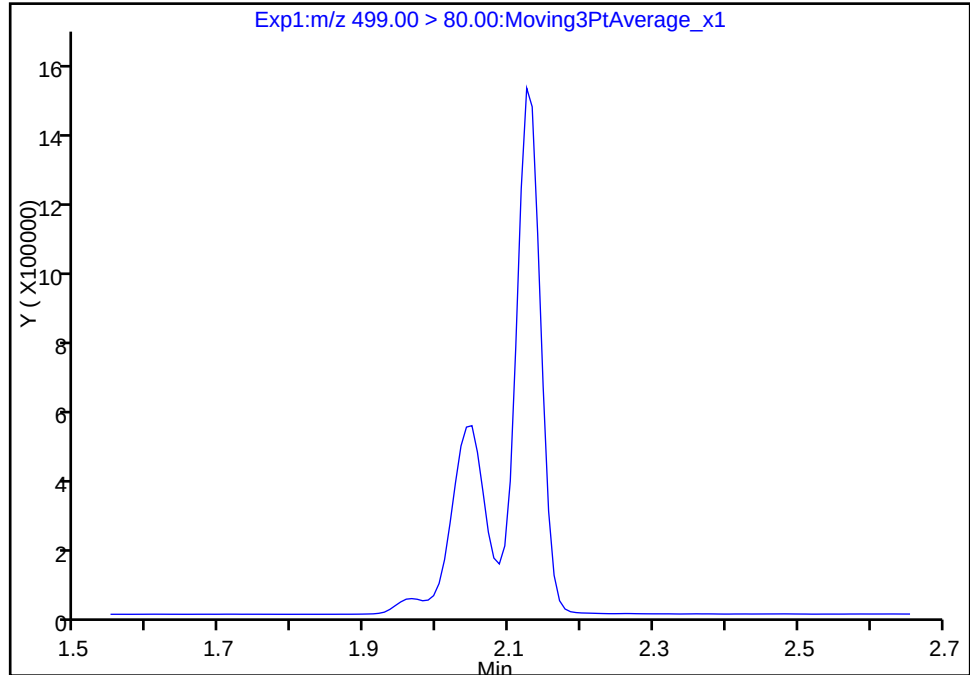
## 8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

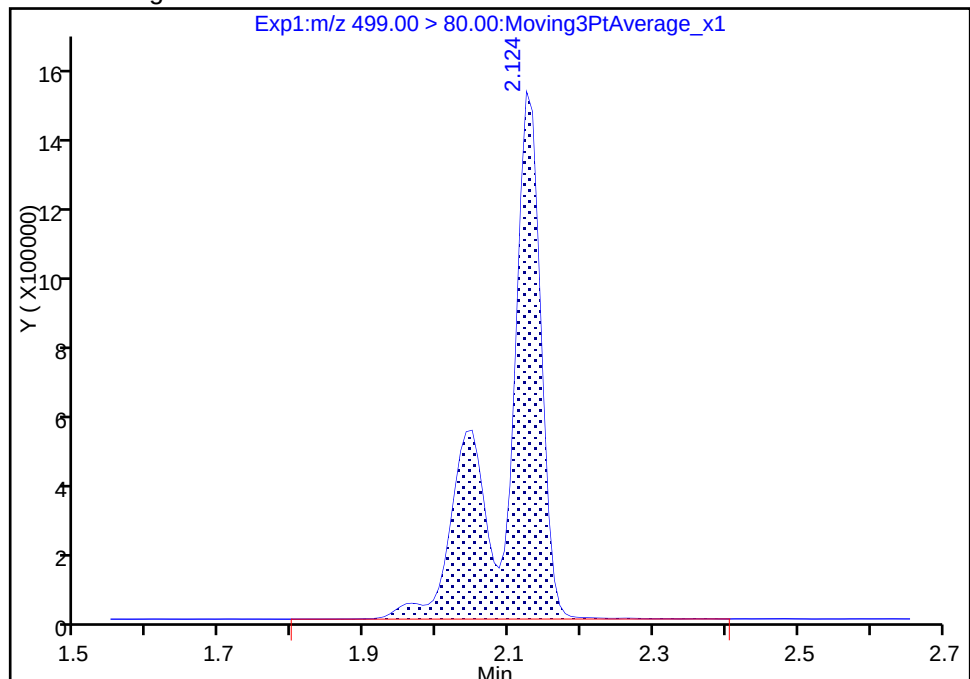
Not Detected

Expected RT: 2.12

## Processing Integration Results



## Manual Integration Results



RT: 2.12

Area: 5484877

Amount: 53.648026

Amount Units: ng/ml

Reviewer: barnettj, 14-Nov-2017 16:56:47

Audit Action: Manually Integrated

Audit Reason: Missed Peak



## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-33018-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_NStart Date: 11/03/2017 13:37Analysis Batch Number: 192908End Date: 11/03/2017 14:24

| LAB SAMPLE ID             | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID                   | COLUMN ID             |
|---------------------------|------------------|------------------|--------------------|-------------------------------|-----------------------|
| IC 320-192908/4           |                  | 11/03/2017 13:37 | 1                  | 2017.11.03_537X<br>ICAL 004.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/5           |                  | 11/03/2017 13:42 | 1                  | 2017.11.03_537X<br>ICAL 005.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/6           |                  | 11/03/2017 13:47 | 1                  | 2017.11.03_537X<br>ICAL 006.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/7<br>ICISAV |                  | 11/03/2017 13:52 | 1                  | 2017.11.03_537X<br>ICAL 007.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/8           |                  | 11/03/2017 13:56 | 1                  | 2017.11.03_537X<br>ICAL 008.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/9           |                  | 11/03/2017 14:01 | 1                  | 2017.11.03_537X<br>ICAL 009.d | GeminiC18 3x100 3(mm) |
| ZZZZZ                     |                  | 11/03/2017 14:06 | 1                  |                               | GeminiC18 3x100 3(mm) |
| CCVL 320-192908/11        |                  | 11/03/2017 14:10 | 1                  | 2017.11.03_537X<br>ICAL 011.d | GeminiC18 3x100 3(mm) |
| ZZZZZ                     |                  | 11/03/2017 14:15 | 1                  |                               | GeminiC18 3x100 3(mm) |
| ICV 320-192908/13         |                  | 11/03/2017 14:20 | 1                  | 2017.11.03_537X<br>ICAL 013.d | GeminiC18 3x100 3(mm) |
| ZZZZZ                     |                  | 11/03/2017 14:24 | 1                  |                               | GeminiC18 3x100 3(mm) |

## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-33018-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_NStart Date: 11/13/2017 02:37Analysis Batch Number: 194241End Date: 11/13/2017 03:38

| LAB SAMPLE ID              | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID              | COLUMN ID             |
|----------------------------|------------------|------------------|--------------------|--------------------------|-----------------------|
| CCVL 320-194241/1          |                  | 11/13/2017 02:37 | 1                  | 2017.11.13_537A<br>004.d | GeminiC18 3x100 3(mm) |
| CCV 320-194241/2<br>CCVIS  |                  | 11/13/2017 02:41 | 1                  | 2017.11.13_537A<br>005.d | GeminiC18 3x100 3(mm) |
| ZZZZZ                      |                  | 11/13/2017 02:46 | 1                  |                          | GeminiC18 3x100 3(mm) |
| MB 320-193512/1-A          |                  | 11/13/2017 02:51 | 1                  | 2017.11.13_537A<br>007.d | GeminiC18 3x100 3(mm) |
| LCS 320-193512/2-A         |                  | 11/13/2017 02:55 | 1                  | 2017.11.13_537A<br>008.d | GeminiC18 3x100 3(mm) |
| LCSD 320-193512/3-A        |                  | 11/13/2017 03:00 | 1                  | 2017.11.13_537A<br>009.d | GeminiC18 3x100 3(mm) |
| 320-33018-1                |                  | 11/13/2017 03:05 | 1                  | 2017.11.13_537A<br>010.d | GeminiC18 3x100 3(mm) |
| 320-33018-2                |                  | 11/13/2017 03:09 | 1                  | 2017.11.13_537A<br>011.d | GeminiC18 3x100 3(mm) |
| 320-33018-3                |                  | 11/13/2017 03:14 | 1                  | 2017.11.13_537A<br>012.d | GeminiC18 3x100 3(mm) |
| 320-33018-4                |                  | 11/13/2017 03:19 | 1                  | 2017.11.13_537A<br>013.d | GeminiC18 3x100 3(mm) |
| 320-33018-5                |                  | 11/13/2017 03:24 | 1                  | 2017.11.13_537A<br>014.d | GeminiC18 3x100 3(mm) |
| 320-33018-6                |                  | 11/13/2017 03:28 | 1                  | 2017.11.13_537A<br>015.d | GeminiC18 3x100 3(mm) |
| 320-33018-7                |                  | 11/13/2017 03:33 | 1                  | 2017.11.13_537A<br>016.d | GeminiC18 3x100 3(mm) |
| CCV 320-194241/14<br>CCVIS |                  | 11/13/2017 03:38 | 1                  | 2017.11.13_537A<br>017.d | GeminiC18 3x100 3(mm) |

## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-33018-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_NStart Date: 11/13/2017 03:38Analysis Batch Number: 194251End Date: 11/13/2017 04:29

| LAB SAMPLE ID              | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID              | COLUMN ID             |
|----------------------------|------------------|------------------|--------------------|--------------------------|-----------------------|
| CCV 320-194251/14<br>CCVIS |                  | 11/13/2017 03:38 | 1                  | 2017.11.13_537A<br>017.d | GeminiC18 3x100 3(mm) |
| ZZZZZ                      |                  | 11/13/2017 03:42 | 1                  |                          | GeminiC18 3x100 3(mm) |
| 320-33018-8                |                  | 11/13/2017 03:47 | 1                  | 2017.11.13_537A<br>019.d | GeminiC18 3x100 3(mm) |
| 320-33018-9                |                  | 11/13/2017 03:52 | 1                  | 2017.11.13_537A<br>020.d | GeminiC18 3x100 3(mm) |
| 320-33018-10               |                  | 11/13/2017 03:56 | 1                  | 2017.11.13_537A<br>021.d | GeminiC18 3x100 3(mm) |
| 320-33018-11               |                  | 11/13/2017 04:01 | 1                  | 2017.11.13_537A<br>022.d | GeminiC18 3x100 3(mm) |
| 320-33018-12               |                  | 11/13/2017 04:06 | 1                  | 2017.11.13_537A<br>023.d | GeminiC18 3x100 3(mm) |
| 320-33018-13               |                  | 11/13/2017 04:10 | 1                  | 2017.11.13_537A<br>024.d | GeminiC18 3x100 3(mm) |
| 320-33018-14               |                  | 11/13/2017 04:15 | 1                  | 2017.11.13_537A<br>025.d | GeminiC18 3x100 3(mm) |
| 320-33018-15               |                  | 11/13/2017 04:20 | 1                  | 2017.11.13_537A<br>026.d | GeminiC18 3x100 3(mm) |
| 320-33018-16               |                  | 11/13/2017 04:24 | 1                  | 2017.11.13_537A<br>027.d | GeminiC18 3x100 3(mm) |
| CCV 320-194251/25<br>CCVIS |                  | 11/13/2017 04:29 | 1                  | 2017.11.13_537A<br>028.d | GeminiC18 3x100 3(mm) |

## LCMS BATCH WORKSHEET

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

SDG No.: \_\_\_\_\_

Batch Number: 193512 Batch Start Date: 11/08/17 11:47 Batch Analyst: Kolstad, Kate MBatch Method: 537 Batch End Date: 11/10/17 21:40

| Lab Sample ID     | Client Sample ID         | Method Chain | Basis | GrossWeight | TareWeight | InitialAmount | FinalAmount | ReceivedpH | LC537-HSP 00023 |
|-------------------|--------------------------|--------------|-------|-------------|------------|---------------|-------------|------------|-----------------|
| MB 320-193512/1   |                          | 537, 537     |       |             |            | 250.00 mL     | 1.00 mL     | 7 SU       |                 |
| LCS 320-193512/2  |                          | 537, 537     |       |             |            | 250.00 mL     | 1.00 mL     | 7 SU       | 100 uL          |
| LCSD 320-193512/3 |                          | 537, 537     |       |             |            | 250.00 mL     | 1.00 mL     | 7 SU       | 100 uL          |
| 320-33018-A-1     | NAWC-110217-RW-286       | 537, 537     | T     | 270.43 g    | 28.11 g    | 242.3 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-2     | NAWC-110217-FRB-286      | 537, 537     | T     | 271.04 g    | 27.17 g    | 243.9 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-3     | WGNA-110217-RW-3978      | 537, 537     | T     | 273.22 g    | 27.56 g    | 245.7 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-4     | WGNA-110217-FRB-3978     | 537, 537     | T     | 274.53 g    | 27.09 g    | 247.4 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-5     | NAWC-110217-RW-177-IRR   | 537, 537     | T     | 270.84 g    | 27.71 g    | 243.1 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-6     | NAWC-110217-FRB-177-IRR  | 537, 537     | T     | 273.38 g    | 27.11 g    | 246.3 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-7     | NAWC-110217-RW-177-SHOP  | 537, 537     | T     | 271.42 g    | 27.64 g    | 243.8 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-8     | NAWC-110217-FRB-177-SHOP | 537, 537     | T     | 278.25 g    | 27.13 g    | 251.1 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-9     | NAWC-110217-RW-185       | 537, 537     | T     | 276.72 g    | 27.58 g    | 249.1 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-10    | NAWC-110217-FRB-185      | 537, 537     | T     | 278.08 g    | 27.51 g    | 250.6 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-11    | NAWC-110217-RW-355       | 537, 537     | T     | 277.12 g    | 27.81 g    | 249.3 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-12    | NAWC-110217-FRB-355      | 537, 537     | T     | 272.81 g    | 27.63 g    | 245.2 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-13    | NAWC-110217-RW-348       | 537, 537     | T     | 278.13 g    | 27.83 g    | 250.3 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-14    | NAWC-110217-FRB-348      | 537, 537     | T     | 279.53 g    | 27.08 g    | 252.5 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-15    | WGNA-110217-RW-3882      | 537, 537     | T     | 278.85 g    | 27.95 g    | 250.9 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-16    | WGNA-110217-FRB-3882     | 537, 537     | T     | 275.73 g    | 27.85 g    | 247.9 mL      | 1.00 mL     | 7 SU       |                 |

| Lab Sample ID   | Client Sample ID | Method Chain | Basis | LC537-IS 00050 | LC537-SU 00051 | AnalysisComment |  |  |  |
|-----------------|------------------|--------------|-------|----------------|----------------|-----------------|--|--|--|
| MB 320-193512/1 |                  | 537, 537     |       | 100 uL         | 100 uL         | Cl ND           |  |  |  |

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

## LCMS BATCH WORKSHEET

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

SDG No.: \_\_\_\_\_

Batch Number: 193512 Batch Start Date: 11/08/17 11:47 Batch Analyst: Kolstad, Kate MBatch Method: 537 Batch End Date: 11/10/17 21:40

| Lab Sample ID        | Client Sample ID             | Method Chain | Basis | LC537-IS 00050 | LC537-SU 00051 | AnalysisComment |  |  |  |
|----------------------|------------------------------|--------------|-------|----------------|----------------|-----------------|--|--|--|
| LCS<br>320-193512/2  |                              | 537, 537     |       | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| LCSD<br>320-193512/3 |                              | 537, 537     |       | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-1        | NAWC-110217-RW-2<br>86       | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-2        | NAWC-110217-FRB-<br>286      | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-3        | WGNA-110217-RW-3<br>978      | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-4        | WGNA-110217-FRB-<br>3978     | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-5        | NAWC-110217-RW-1<br>77-IRR   | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-6        | NAWC-110217-FRB-<br>177-IRR  | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-7        | NAWC-110217-RW-1<br>77-SHOP  | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-8        | NAWC-110217-FRB-<br>177-SHOP | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-9        | NAWC-110217-RW-1<br>85       | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-10       | NAWC-110217-FRB-<br>185      | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-11       | NAWC-110217-RW-3<br>55       | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-12       | NAWC-110217-FRB-<br>355      | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-13       | NAWC-110217-RW-3<br>48       | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-14       | NAWC-110217-FRB-<br>348      | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-15       | WGNA-110217-RW-3<br>882      | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-16       | WGNA-110217-FRB-<br>3882     | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |

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

## LCMS BATCH WORKSHEET

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

SDG No.: \_\_\_\_\_

Batch Number: 193512 Batch Start Date: 11/08/17 11:47 Batch Analyst: Kolstad, Kate MBatch Method: 537 Batch End Date: 11/10/17 21:40

| Batch Notes                          |            |
|--------------------------------------|------------|
| Analyst ID - Aliquot Step            | TWL        |
| Analyst ID - Concentration           | NIGHTS/CCB |
| Analyst ID - Final Volume Step       | CCB        |
| Internal Standard ID#                | 1041858    |
| Manifold ID                          | 3, 4       |
| Methanol ID                          | 1076416    |
| Pipette ID                           | M16387D    |
| Analyst ID - IS Reagent Drop         | CCB        |
| Analyst ID - IS Reagent Drop Witness | JNS        |
| Analyst ID - SU Reagent Drop         | VPM        |
| Analyst ID - SU Reagent Drop Witness | KMK        |
| Analyst ID - TA Reagent Drop         | VPM        |
| Analyst ID - TA Reagent Drop Witness | KMK        |
| SPE Cartridge ID                     | 6357081-09 |
| Trizma ID                            | SLBR4303V  |
| Reagent Water ID                     | 11-2-17    |

| Basis | Basis Description |
|-------|-------------------|
| T     | Total/NA          |

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

A8

Job No: 33018 Instrument ID & Date: 11-13-17 ICAL Batch: 192908  
 Extraction Batch: 193512 Worklist #: 50325, 50549 TALS Batch: 194241, 194251, 195210

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

1st Level Reviewer / Date: JRB 11-16-17

2nd Level Reviewer / Date: Mr. Jaff 11/17/2017

NCM # and Comments: 107642

A8

Instrument ID & Date: 11-3-17 Worklist#: 49975

ICAL Batch: 192908, 192909 Calibration ID number: 36012, 36013

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

1<sup>st</sup> Level Reviewer / Date: JRB 11-6-17

2<sup>nd</sup> Level Reviewer / Date: M. W. J. 11/6/2017

NCM # and Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



TestAmerica Laboratories  
Worklist QC Batch Report

Worklist Name: 13NOV2017\_537A

Worklist Number: 50325

Instrument Name: A8\_N

Chrom Method: 537\_A8\_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8\_N\20171113-50325.b

QC Batching: Enabled

Limit Group Batching: Enabled

| QC Batch: 1             | LC 537 ICAL<br>Raw Batch: 194241 | LC 537 CS ICAL<br>Raw Batch: 194242 |
|-------------------------|----------------------------------|-------------------------------------|
| # 1 CCVL                | # 1 CCVL                         | # 1 CCVL                            |
| # 2 CCV L3              | # 2 CCV L3                       | # 2 CCV L3                          |
| # 3 RB                  | # 3 RB                           | # 3 RB                              |
| # 4 MB 320-193512/1-A   | # 4 MB 320-193512/1-A            |                                     |
| # 5 LCS 320-193512/2-A  | # 5 LCS 320-193512/2-A           |                                     |
| # 6 LCSD 320-193512/3-A | # 6 LCSD 320-193512/3-A          |                                     |
| # 7 320-33018-A-1-A     | # 7 320-33018-A-1-A              |                                     |
| # 8 320-33018-A-2-A     | # 8 320-33018-A-2-A              |                                     |
| # 9 320-33018-A-3-A     | # 9 320-33018-A-3-A              |                                     |
| #10 320-33018-A-4-A     | #10 320-33018-A-4-A              |                                     |
| #11 320-33018-A-5-A     | #11 320-33018-A-5-A              |                                     |
| #12 320-33018-A-6-A     | #12 320-33018-A-6-A              |                                     |
| #13 320-33018-A-7-A     | #13 320-33018-A-7-A              |                                     |
| #14 CCV L5              | #14 CCV L5                       |                                     |

| QC Batch: 2          | LC 537 ICAL<br>Raw Batch: 194251 | LC 537 CS ICAL<br>Raw Batch: 194252 |
|----------------------|----------------------------------|-------------------------------------|
| #14 CCV L5           | #14 CCV L5                       |                                     |
| #15 RB               | #15 RB                           |                                     |
| #16 320-33018-A-8-A  | #16 320-33018-A-8-A              |                                     |
| #17 320-33018-A-9-A  | #17 320-33018-A-9-A              |                                     |
| #18 320-33018-A-10-A | #18 320-33018-A-10-A             |                                     |
| #19 320-33018-A-11-A | #19 320-33018-A-11-A             |                                     |
| #20 320-33018-A-12-A | #20 320-33018-A-12-A             |                                     |
| #21 320-33018-A-13-A | #21 320-33018-A-13-A             |                                     |
| #22 320-33018-A-14-A | #22 320-33018-A-14-A             |                                     |
| #23 320-33018-A-15-A | #23 320-33018-A-15-A             |                                     |
| #24 320-33018-A-16-A | #24 320-33018-A-16-A             |                                     |
| #25 CCV L3           | #25 CCV L3                       | #25 CCV L3                          |

| QC Batch: 3             | LC 537 ICAL<br>Raw Batch: 194253 | LC 537 CS ICAL<br>Raw Batch: 194254 |
|-------------------------|----------------------------------|-------------------------------------|
| #25 CCV L3              | #25 CCV L3                       | #25 CCV L3                          |
| #26 RB                  | #26 RB                           | #26 RB                              |
| #27 MB 320-193312/1-A   |                                  | #27 MB 320-193312/1-A               |
| #28 LCS 320-193312/2-A  |                                  | #28 LCS 320-193312/2-A              |
| #29 LCSD 320-193312/3-A |                                  | #29 LCSD 320-193312/3-A             |
| #30 320-33007-A-1-B     |                                  | #30 320-33007-A-1-B                 |
| #31 320-33007-A-2-B     |                                  | #31 320-33007-A-2-B                 |
| #32 320-33007-A-3-D     |                                  | #32 320-33007-A-3-D                 |
| #33 320-33007-A-3-E MS  |                                  | #33 320-33007-A-3-E MS              |
| #34 320-33007-A-3-F MSD |                                  | #34 320-33007-A-3-F MSD             |
| #35 320-33007-A-4-B     |                                  | #35 320-33007-A-4-B                 |
| #36 320-33007-A-5-B     |                                  | #36 320-33007-A-5-B                 |
| #37 CCV L5              |                                  | #37 CCV L5                          |

| QC Batch: 4 | LC 537 CS ICAL<br>Raw Batch: 194255 |
|-------------|-------------------------------------|
| #37 CCV L5  | #37 CCV L5                          |
| #38 RB      | #38 RB                              |

| QC Batch: 4             | LC 537 CS ICAL<br>Raw Batch: 194255 |
|-------------------------|-------------------------------------|
| #39 MB 320-193285/1-A   | #39 MB 320-193285/1-A               |
| #40 LCS 320-193285/2-A  | #40 LCS 320-193285/2-A              |
| #41 LCSD 320-193285/3-A | #41 LCSD 320-193285/3-A             |
| #42 320-33003-A-1-A     | #42 320-33003-A-1-A                 |
| #43 320-33003-A-2-A     | #43 320-33003-A-2-A                 |
| #44 320-33003-A-3-A     | #44 320-33003-A-3-A                 |
| #45 320-33003-A-4-A     | #45 320-33003-A-4-A                 |
| #46 320-33003-A-5-A     | #46 320-33003-A-5-A                 |
| #47 320-33003-A-6-A     | #47 320-33003-A-6-A                 |
| #48 320-33003-A-7-A     | #48 320-33003-A-7-A                 |
| #49 CCV L3              | #49 CCV L3                          |

| QC Batch: 5             | LC 537 CS ICAL<br>Raw Batch: 194256 |
|-------------------------|-------------------------------------|
| #49 CCV L3              | #49 CCV L3                          |
| #50 RB                  | #50 RB                              |
| #51 320-33003-A-8-A     | #51 320-33003-A-8-A                 |
| #52 320-33003-A-8-B MS  | #52 320-33003-A-8-B MS              |
| #53 320-33003-A-8-C MSD | #53 320-33003-A-8-C MSD             |
| #54 320-33003-A-9-A     | #54 320-33003-A-9-A                 |
| #55 320-33003-A-10-A    | #55 320-33003-A-10-A                |
| #56 320-33006-A-1-A     | #56 320-33006-A-1-A                 |
| #57 320-33006-A-2-A     | #57 320-33006-A-2-A                 |
| #58 320-33006-A-3-A     | #58 320-33006-A-3-A                 |
| #59 320-33006-A-4-A     | #59 320-33006-A-4-A                 |
| #60 320-33006-A-5-A     | #60 320-33006-A-5-A                 |
| #61 CCV L5              | #61 CCV L5                          |

| QC Batch: 6         | LC 537 CS ICAL<br>Raw Batch: 194257 | LC 537 ICAL<br>Raw Batch: 194258 |
|---------------------|-------------------------------------|----------------------------------|
| #61 CCV L5          | #61 CCV L5                          |                                  |
| #62 RB              | #62 RB                              |                                  |
| #63 320-33006-A-6-A | #63 320-33006-A-6-A                 |                                  |
| #64 CCV L3          | #64 CCV L3                          |                                  |
| #65 RB              | #65 RB                              | #65 RB                           |

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512

Analyst: Kolstad, Kate M

Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537\_Prep-320

Batch End: 11/10/2017 9:40:00PM

## Extraction of Perfluorinated Alkyl Acids

| Input Sample Lab ID<br>(Analytical Method) | SDG<br>(Job #)       | GrossWt<br>TareWt | InitAmnt<br>FinAmnt | Rcvd | PHs<br>Adj1 | Adj2 | Due Date | Analytical<br>TAT | Div<br>Rank | Comments | Output Sample Lab ID                                                                  |
|--------------------------------------------|----------------------|-------------------|---------------------|------|-------------|------|----------|-------------------|-------------|----------|---------------------------------------------------------------------------------------|
| 1 MB-320-193512/1<br>N/A                   | N/A                  |                   | 250.00 mL           | 7    |             |      | N/A      | N/A               | N/A         | CI ND    |    |
|                                            |                      |                   | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 2 LCS-320-193512/2<br>N/A                  | N/A                  |                   | 250.00 mL           | 7    |             |      | N/A      | N/A               | N/A         | CI ND    |    |
|                                            |                      |                   | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 3 LCSD-320-193512/3<br>N/A                 | N/A                  |                   | 250.00 mL           | 7    |             |      | N/A      | N/A               | N/A         | CI ND    |    |
|                                            |                      |                   | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 320-33018-A-1<br>(537_DOD5)                | N/A<br>(320-33018-1) | 270.43 g          | 242.3 mL            | 7    |             |      | 11/7/17  | 16_Days           | 4           | CI ND    |    |
|                                            |                      | 28.11 g           | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 320-33018-A-2<br>(537_DOD5)                | N/A<br>(320-33018-1) | 271.04 g          | 243.9 mL            | 7    |             |      | 11/7/17  | 16_Days           | 4           | CI ND    |    |
|                                            |                      | 27.17 g           | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 320-33018-A-3<br>(537_DOD5)                | N/A<br>(320-33018-1) | 273.22 g          | 245.7 mL            | 7    |             |      | 11/7/17  | 16_Days           | 4           | CI ND    |    |
|                                            |                      | 27.56 g           | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 320-33018-A-4<br>(537_DOD5)                | N/A<br>(320-33018-1) | 274.53 g          | 247.4 mL            | 7    |             |      | 11/7/17  | 16_Days           | 4           | CI ND    |  |
|                                            |                      | 27.09 g           | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 320-33018-A-5<br>(537_DOD5)                | N/A<br>(320-33018-1) | 270.84 g          | 243.1 mL            | 7    |             |      | 11/7/17  | 16_Days           | 4           | CI ND    |  |
|                                            |                      | 27.71 g           | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 320-33018-A-6<br>(537_DOD5)                | N/A<br>(320-33018-1) | 273.38 g          | 246.3 mL            | 7    |             |      | 11/7/17  | 16_Days           | 4           | CI ND    |  |
|                                            |                      | 27.11 g           | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 320-33018-A-7<br>(537_DOD5)                | N/A<br>(320-33018-1) | 271.42 g          | 243.8 mL            | 7    |             |      | 11/7/17  | 16_Days           | 4           | CI ND    |  |
|                                            |                      | 27.64 g           | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |

RI

RI

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512

Analyst: Kolstad, Kate M

Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537\_Prep-320

Batch End: 11/10/2017 9:40:00PM

|    |                              |                      |          |          |   |  |         |         |   |       |                                                                                       |
|----|------------------------------|----------------------|----------|----------|---|--|---------|---------|---|-------|---------------------------------------------------------------------------------------|
| 11 | 320-33018-A-8<br>(537_DOD5)  | N/A<br>(320-33018-1) | 278.25 g | 251.1 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |    |
|    |                              |                      | 27.13 g  | 1.00 mL  |   |  |         |         |   |       |                                                                                       |
| 12 | 320-33018-A-9<br>(537_DOD5)  | N/A<br>(320-33018-1) | 276.72 g | 249.1 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |    |
|    |                              |                      | 27.58 g  | 1.00 mL  |   |  |         |         |   |       |                                                                                       |
| 13 | 320-33018-A-10<br>(537_DOD5) | N/A<br>(320-33018-1) | 278.08 g | 250.6 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |    |
|    |                              |                      | 27.51 g  | 1.00 mL  |   |  |         |         |   |       |                                                                                       |
| 14 | 320-33018-A-11<br>(537_DOD5) | N/A<br>(320-33018-1) | 277.12 g | 249.3 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |    |
|    |                              |                      | 27.81 g  | 1.00 mL  |   |  |         |         |   |       |                                                                                       |
| 15 | 320-33018-A-12<br>(537_DOD5) | N/A<br>(320-33018-1) | 272.81 g | 245.2 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |    |
|    |                              |                      | 27.63 g  | 1.00 mL  |   |  |         |         |   |       |                                                                                       |
| 16 | 320-33018-A-13<br>(537_DOD5) | N/A<br>(320-33018-1) | 278.13 g | 250.3 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |    |
|    |                              |                      | 27.83 g  | 1.00 mL  |   |  |         |         |   |       |                                                                                       |
| 17 | 320-33018-A-14<br>(537_DOD5) | N/A<br>(320-33018-1) | 279.53 g | 252.5 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |    |
|    |                              |                      | 27.08 g  | 1.00 mL  |   |  |         |         |   |       |                                                                                       |
| 18 | 320-33018-A-15<br>(537_DOD5) | N/A<br>(320-33018-1) | 278.85 g | 250.9 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |    |
|    |                              |                      | 27.95 g  | 1.00 mL  |   |  |         |         |   |       |                                                                                       |
| 19 | 320-33018-A-16<br>(537_DOD5) | N/A<br>(320-33018-1) | 275.73 g | 247.9 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |  |
|    |                              |                      | 27.85 g  | 1.00 mL  |   |  |         |         |   |       |                                                                                       |

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# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512

Analyst: Kolstad, Kate M

Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537\_Prep-320

Batch End: 11/10/2017 9:40:00PM

## Batch Notes

Manifold ID 3, 4

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-09

Methanol ID 1076416

Reagent Water ID 11-2-17

Internal Standard ID# 1041858

Pipette ID M16387D

Analyst ID - TA Reagent Drop VPM

Analyst ID - TA Reagent Drop KMK

Witness

Analyst ID - SU Reagent Drop VPM

Analyst ID - SU Reagent Drop KMK

Witness

Analyst ID - IS Reagent Drop CCB

Analyst ID - IS Reagent Drop JNS

Witness

Analyst ID - Concentration NIGHTS/CCB

Analyst ID - Aliquot Step TWL

Analyst ID - Final Volume Step CCB

Batch Comment NA

## Comments

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512

Analyst: Kolstad, Kate M

Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537\_Prep-320

Batch End:

## Reagent Additions Worksheet

| Lab ID            | Reagent Code    | Amount Added | Final Amount | By          | Witness     |
|-------------------|-----------------|--------------|--------------|-------------|-------------|
| MB 320-193512/1   | LC537-SU_00051  | 100 uL       | 1.00 mL      | vpm 11/8/17 | kmk 11-8-17 |
| LCS 320-193512/2  | LC537-HSP_00023 | 100 uL       | 1.00 mL      |             |             |
| LCS 320-193512/2  | LC537-SU_00051  | 100 uL       | 1.00 mL      |             |             |
| LCSD 320-193512/3 | LC537-HSP_00023 | 100 uL       | 1.00 mL      |             |             |
| LCSD 320-193512/3 | LC537-SU_00051  | 100 uL       | 1.00 mL      |             |             |
| 320-33018-A-1     | LC537-SU_00051  | 100 uL       | 1.00 mL      |             |             |
| 320-33018-A-2     | LC537-SU_00051  | 100 uL       | 1.00 mL      |             |             |
| 320-33018-A-3     | LC537-SU_00051  | 100 uL       | 1.00 mL      |             |             |
| 320-33018-A-4     | LC537-SU_00051  | 100 uL       | 1.00 mL      |             |             |
| 320-33018-A-5     | LC537-SU_00051  | 100 uL       | 1.00 mL      |             |             |
| 320-33018-A-6     | LC537-SU_00051  | 100 uL       | 1.00 mL      |             |             |
| 320-33018-A-7     | LC537-SU_00051  | 100 uL       | 1.00 mL      |             |             |
| 320-33018-A-8     | LC537-SU_00051  | 100 uL       | 1.00 mL      |             |             |
| 320-33018-A-9     | LC537-SU_00051  | 100 uL       | 1.00 mL      |             |             |
| 320-33018-A-10    | LC537-SU_00051  | 100 uL       | 1.00 mL      |             |             |
| 320-33018-A-11    | LC537-SU_00051  | 100 uL       | 1.00 mL      |             |             |
| 320-33018-A-12    | LC537-SU_00051  | 100 uL       | 1.00 mL      |             |             |
| 320-33018-A-13    | LC537-SU_00051  | 100 uL       | 1.00 mL      |             |             |

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# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512

Analyst: Kolstad, Kate M

Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537\_Prep-320

Batch End:

|                |                |        |         |             |             |
|----------------|----------------|--------|---------|-------------|-------------|
| 320-33018-A-14 | LC537-SU_00051 | 100 uL | 1.00 mL | VPM 11/8/17 | KMK 11-8-17 |
| 320-33018-A-15 | LC537-SU_00051 | 100 uL | 1.00 mL | ↓           | ↓           |
| 320-33018-A-16 | LC537-SU_00051 | 100 uL | 1.00 mL | ↓           | ↓           |

## Other Reagents:

Reagent

Amount/Units

Lot#:

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Preparation Batch Number(s) 193512

Test 537-Prep

Earliest Holding Time 11-16-17

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

1<sup>st</sup> Level Reviewer: TWZ

Date: 11/10/17

2<sup>nd</sup> Level Reviewer: VPM

Date: 11/11/17

Comments: \_\_\_\_\_



# Shipping and Receiving Documents

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

# Chain of Custody Record

**TestAmerica**  
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

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

|                                                                                                                                                                                                                                                                                                                                                                           |                    |                                        |                                        |                                                                                                                                                                                                                                                            |                   |                                                                |   |                        |                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------------------------------------------------|---|------------------------|---------------------|
| <b>Client Contact</b>                                                                                                                                                                                                                                                                                                                                                     |                    | <b>Project Manager:</b> Andy Frebowitz |                                        | <b>Site Contact:</b> Mary Kay Bond                                                                                                                                                                                                                         |                   | <b>Date:</b> 11/2/2017                                         |   | <b>COC No:</b>         |                     |
| TetraTech                                                                                                                                                                                                                                                                                                                                                                 |                    | Tel/Fax: 610.382.1170                  |                                        | Lab Contact: Dave Alltucker                                                                                                                                                                                                                                |                   | Carrier: FedEx                                                 |   | 1 of 1 COCs            |                     |
| 234 Mall Boulevard Suite 260                                                                                                                                                                                                                                                                                                                                              |                    | <b>Analysis Turnaround Time</b>        |                                        | <input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS<br>TAT if different from Below 21<br><input type="checkbox"/> 2 weeks<br><input type="checkbox"/> 1 week<br><input type="checkbox"/> 2 days<br><input type="checkbox"/> 1 day |                   | Filtered Sample (Y/N)<br>Perform MS/MSD (Y/N)<br>EPA 537 UCMR3 |   | Sampler: Mary Kay Bond |                     |
| King of Prussia, PA 19406                                                                                                                                                                                                                                                                                                                                                 |                    |                                        |                                        |                                                                                                                                                                                                                                                            |                   |                                                                |   | For Lab Use Only:      |                     |
| 610-382-1174                                                                                                                                                                                                                                                                                                                                                              |                    |                                        |                                        |                                                                                                                                                                                                                                                            |                   |                                                                |   | Walk-in Client:        |                     |
| 610-491-9688                                                                                                                                                                                                                                                                                                                                                              |                    |                                        |                                        |                                                                                                                                                                                                                                                            |                   |                                                                |   | Lab Sampling:          |                     |
| Project Name: WE04                                                                                                                                                                                                                                                                                                                                                        |                    |                                        |                                        |                                                                                                                                                                                                                                                            |                   |                                                                |   | Job / SDG No.:         |                     |
| Site: WE04                                                                                                                                                                                                                                                                                                                                                                |                    |                                        |                                        |                                                                                                                                                                                                                                                            |                   |                                                                |   |                        |                     |
| P O # 1132358 (through EarthToxics)                                                                                                                                                                                                                                                                                                                                       |                    |                                        |                                        |                                                                                                                                                                                                                                                            |                   |                                                                |   |                        |                     |
| <b>Sample Identification</b>                                                                                                                                                                                                                                                                                                                                              | <b>Sample Date</b> | <b>Sample Time</b>                     | <b>Sample Type</b><br>(C=Comp, G=Grab) | <b>Matrix</b>                                                                                                                                                                                                                                              | <b># of Cont.</b> | <b>Sample Specific Notes:</b>                                  |   |                        |                     |
| NAWC-110217-RW-286                                                                                                                                                                                                                                                                                                                                                        | 11/2/2017          | 08:10                                  | G                                      | DW                                                                                                                                                                                                                                                         | 2                 | N                                                              | N | Y                      |                     |
| NAWC-110217-FRB-286                                                                                                                                                                                                                                                                                                                                                       | 11/2/2017          | 08:05                                  | G                                      | DW                                                                                                                                                                                                                                                         | 2                 | N                                                              | N | Y                      | Field Reagent Blank |
| WGNA-110217-RW-3978                                                                                                                                                                                                                                                                                                                                                       | 11/2/2017          | 08:40                                  | G                                      | DW                                                                                                                                                                                                                                                         | 2                 | N                                                              | N | Y                      |                     |
| WGNA-110217-FRB-3978                                                                                                                                                                                                                                                                                                                                                      | 11/2/2017          | 08:35                                  | G                                      | DW                                                                                                                                                                                                                                                         | 2                 | N                                                              | N | Y                      | Field Reagent Blank |
| NAWC-110217-RW-177-IRR                                                                                                                                                                                                                                                                                                                                                    | 11/2/2017          | 09:10                                  | G                                      | DW                                                                                                                                                                                                                                                         | 2                 | N                                                              | N | Y                      |                     |
| <input checked="" type="checkbox"/> NAWC-110217-FRB-177-IRR                                                                                                                                                                                                                                                                                                               | 11/2/2017          | 09:05                                  | G                                      | DW                                                                                                                                                                                                                                                         | 2                 | N                                                              | N | Y                      | Field Reagent Blank |
| NAWC-110217-RW-177-SHOP                                                                                                                                                                                                                                                                                                                                                   | 11/2/2017          | 9:20                                   | G                                      | DW                                                                                                                                                                                                                                                         | 2                 | N                                                              | N | Y                      |                     |
| NAWC-110217-FRB-177-SHOP                                                                                                                                                                                                                                                                                                                                                  | 11/2/2017          | 9:15                                   | G                                      | DW                                                                                                                                                                                                                                                         | 2                 | N                                                              | N | Y                      | Field Reagent Blank |
| NAWC-110217-RW-185                                                                                                                                                                                                                                                                                                                                                        | 11/2/2017          | 10:10                                  | G                                      | DW                                                                                                                                                                                                                                                         | 2                 | N                                                              | N | Y                      |                     |
| NAWC-110217-FRB-185                                                                                                                                                                                                                                                                                                                                                       | 11/2/2017          | 10:05                                  | G                                      | DW                                                                                                                                                                                                                                                         | 2                 | N                                                              | N | Y                      | Field Reagent Blank |
| NAWC-110217-RW-355                                                                                                                                                                                                                                                                                                                                                        | 11/2/2017          | 10:40                                  | G                                      | DW                                                                                                                                                                                                                                                         | 2                 | N                                                              | N | Y                      |                     |
| NAWC-110217-FRB-355                                                                                                                                                                                                                                                                                                                                                       | 11/2/2017          | 10:35                                  | G                                      | DW                                                                                                                                                                                                                                                         | 2                 | N                                                              | N | Y                      | Field Reagent Blank |
| NAWC-110217-RW-348                                                                                                                                                                                                                                                                                                                                                        | 11/2/2017          | 11:40                                  | G                                      | DW                                                                                                                                                                                                                                                         | 2                 | N                                                              | N | Y                      |                     |
| NAWC-110217-FRB-348                                                                                                                                                                                                                                                                                                                                                       | 11/2/2017          | 11:35                                  | G                                      | DW                                                                                                                                                                                                                                                         | 2                 | N                                                              | N | Y                      | Field Reagent Blank |
| WGNA-110217-RW-3882                                                                                                                                                                                                                                                                                                                                                       | 11/2/2017          | 15:40                                  | G                                      | DW                                                                                                                                                                                                                                                         | 2                 | N                                                              | N | Y                      |                     |
| WGNA-110217-FRB-3882                                                                                                                                                                                                                                                                                                                                                      | 11/2/2017          | 15:35                                  | G                                      | DW                                                                                                                                                                                                                                                         | 2                 | N                                                              | N | Y                      | Field Reagent Blank |
| *label NAWC-110217-FRB-182 AA 11/09/17                                                                                                                                                                                                                                                                                                                                    |                    |                                        |                                        |                                                                                                                                                                                                                                                            |                   |                                                                |   |                        |                     |
| Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other: Trizma                                                                                                                                                                                                                                                                                           |                    |                                        |                                        |                                                                                                                                                                                                                                                            |                   |                                                                |   |                        |                     |
| Possible Hazard Identification:<br>Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the                                                                                                                                                                                                                               |                    |                                        |                                        |                                                                                                                                                                                                                                                            |                   |                                                                |   |                        |                     |
| <input checked="" type="checkbox"/> Non-Hazardous <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison 9 <input type="checkbox"/> Unknown                                                                                                                                                                            |                    |                                        |                                        |                                                                                                                                                                                                                                                            |                   |                                                                |   |                        |                     |
| Fed Ex Tracking: 770649711525 (2 Coolers)                                                                                                                                                                                                                                                                                                                                 |                    |                                        |                                        |                                                                                                                                                                                                                                                            |                   |                                                                |   |                        |                     |
| Custody Seal Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No<br>Relinquished by: <i>[Signature]</i> Company: Tetra Tech Date/Time: 11/2/2017 18:00<br>Relinquished by: Company: Date/Time: Received by: <i>[Signature]</i> Company: Taus Date/Time: 11/03/17 9:40<br>Relinquished by: Company: Date/Time: Received in Laboratory by: Company: Date/Time: |                    |                                        |                                        |                                                                                                                                                                                                                                                            |                   |                                                                |   |                        |                     |



320-33018 Chain of Custody

S:\WillowGrove PFOs Private Well\COCs TT\COC 20171102

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

## Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-33018-1

**Login Number: 33018**

**List Source: TestAmerica Sacramento**

**List Number: 1**

**Creator: Turpen, Troy**

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

"NAWC-110217-RW-286","537","RES","320-33018-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","21","ng/L","J M","7.0","DL","","TRG","","","41","LOQ","YES","-99","","242.3","1.00","17","","

"NAWC-110217-RW-286","537","RES","320-33018-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","16","ng/L","J","2.9","DL","","TRG","","","21","LOQ","YES","-99","","242.3","1.00","8.3","","

"NAWC-110217-RW-286","537","RES","320-33018-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","6.5","ng/L","J","5.7","DL","","TRG","","","31","LOQ","YES","-99","","242.3","1.00","12","","

"NAWC-110217-RW-286","537","RES","320-33018-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","37","ng/L","U","17","DL","","TRG","","","93","LOQ","YES","-99","","242.3","1.00","37","","

"NAWC-110217-RW-286","537","RES","320-33018-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.9","ng/L","J","2.0","DL","","TRG","","","10","LOQ","YES","-99","","242.3","1.00","4.1","","

"NAWC-110217-RW-286","537","RES","320-33018-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","21","ng/L","U M","8.3","DL","","TRG","","","25","LOQ","YES","-99","","242.3","1.00","21","","

"NAWC-110217-RW-286","537","RES","320-33018-1","TALSAC","STL00993","13C2 PFHxA","35","ng/L","","-99","DL","","SURRE","84","","-99","LOQ","YES","41.3","","242.3","1.00","0","","

"NAWC-110217-RW-286","537","RES","320-33018-1","TALSAC","STL00996","13C2 PFDA","33","ng/L","","-99","DL","","SURRE","79","","-99","LOQ","YES","41.3","","242.3","1.00","0","","

"NAWC-110217-FRB-185","537","RES","320-33018-10","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250.6","1.00","16","","

"NAWC-110217-FRB-185","537","RES","320-33018-10","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250.6","1.00","8.0","","

"NAWC-110217-FRB-185","537","RES","320-33018-10","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250.6","1.00","12","","

"NAWC-110217-FRB-185","537","RES","320-33018-10","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250.6","1.00","36","","

"NAWC-110217-FRB-185","537","RES","320-33018-10","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250.6","1.00","4.0","","

"NAWC-110217-FRB-185","537","RES","320-33018-10","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250.6","1.00","20","","

"NAWC-110217-FRB-185","537","RES","320-33018-10","TALSAC","STL00993","13C2 PFHxA","35","ng/L","","-99","DL","","SURRE","87","","-99","LOQ","YES","39.9","","250.6","1.00","0","","

"NAWC-110217-FRB-185","537","RES","320-33018-10","TALSAC","STL00996","13C2 PFDA","35","ng/L","","-99","DL","","SURRE","88","","-99","LOQ","YES","39.9","","250.6","1.00","0","","

"NAWC-110217-RW-355","537","RES","320-33018-11","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","9.2","ng/L","J","6.8","DL","","TRG","","","40","LOQ","YES","-99","","249.3","1.00","16","","

"NAWC-110217-RW-355","537","RES","320-33018-11","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.8","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","249.3","1.00","8.0","","

"NAWC-110217-RW-355","537","RES","320-33018-11","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","6.1","ng/L","J","5.5","DL","","TRG","","","30","LOQ","YES","-99","","249.3","1.00","12","","

"NAWC-110217-RW-355","537","RES","320-33018-11","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","249.3","1.00","36","","

"NAWC-110217-RW-355","537","RES","320-33018-11","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","2.3","ng/L","J M","1.9","DL","","TRG","","","10","LOQ","YES","-99","","249.3","1.00","4.0","","

"NAWC-110217-RW-355","537","RES","320-33018-11","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U M","8.0","DL","","TRG","","","24","LOQ","YES","-99","","249.3","1.00","20","","

"NAWC-110217-RW-355","537","RES","320-33018-11","TALSAC","STL00993","13C2 PFHxA","31","ng/L","","-99","DL","","SURRE","77","","-99","LOQ","YES","40.1","","249.3","1.00","0","","

"NAWC-110217-RW-355","537","RES","320-33018-11","TALSAC","STL00996","13C2 PFDA","33","ng/L","","-99","DL","","SURRE","82","","-99","LOQ","YES","40.1","","249.3","1.00","0","","

"NAWC-110217-FRB-355","537","RES","320-33018-12","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.9","DL","","TRG","","","41","LOQ","YES","-99","","245.2","1.00","16","","

"NAWC-110217-FRB-355","537","RES","320-33018-12","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.2","ng/L","U","2.9","DL","","TRG","","","20","LOQ","YES","-99","","245.2","1.00","8.2","","

"NAWC-110217-FRB-355","537","RES","320-33018-12","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS),"12","ng/L","U","5.6","DL","","TRG","","","31","LOQ","YES",-99","","245.2","1.00","12",""  
"NAWC-110217-FRB-355","537","RES","320-33018-12","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS),"37","ng/L","U","16","DL","","TRG","","","92","LOQ","YES",-99","","245.2","1.00","37",""  
"NAWC-110217-FRB-355","537","RES","320-33018-12","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA),"4.1","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES",-99","","245.2","1.00","4.1",""  
"NAWC-110217-FRB-355","537","RES","320-33018-12","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA),"20","ng/L","U","8.2","DL","","TRG","","","24","LOQ","YES",-99","","245.2","1.00","20",""  
"NAWC-110217-FRB-355","537","RES","320-33018-12","TALSAC","STL00993","13C2  
PFHxA","36","ng/L","","-99","DL","","SURR","89","","-99","LOQ","YES","40.8","","245.2","1.00","0",""  
"NAWC-110217-FRB-355","537","RES","320-33018-12","TALSAC","STL00996","13C2  
PFDA","34","ng/L","","-99","DL","","SURR","82","","-99","LOQ","YES","40.8","","245.2","1.00","0",""  
"NAWC-110217-RW-348","537","RES","320-33018-13","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS),"33","ng/L","J","6.8","DL","","TRG","","","40","LOQ","YES",-99","","250.3","1.00","16",""  
"NAWC-110217-RW-348","537","RES","320-33018-13","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA),"19","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES",-99","","250.3","1.00","8.0",""  
"NAWC-110217-RW-348","537","RES","320-33018-13","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS),"10","ng/L","J","5.5","DL","","TRG","","","30","LOQ","YES",-99","","250.3","1.00","12",""  
"NAWC-110217-RW-348","537","RES","320-33018-13","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS),"36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES",-99","","250.3","1.00","36",""  
"NAWC-110217-RW-348","537","RES","320-33018-13","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA),"4.7","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES",-99","","250.3","1.00","4.0",""  
"NAWC-110217-RW-348","537","RES","320-33018-13","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA),"20","ng/L","U M","8.0","DL","","TRG","","","24","LOQ","YES",-99","","250.3","1.00","20",""  
"NAWC-110217-RW-348","537","RES","320-33018-13","TALSAC","STL00993","13C2  
PFHxA","33","ng/L","","-99","DL","","SURR","82","","-99","LOQ","YES","40.0","","250.3","1.00","0",""  
"NAWC-110217-RW-348","537","RES","320-33018-13","TALSAC","STL00996","13C2  
PFDA","33","ng/L","","-99","DL","","SURR","83","","-99","LOQ","YES","40.0","","250.3","1.00","0",""  
"NAWC-110217-FRB-348","537","RES","320-33018-14","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS),"16","ng/L","U","6.7","DL","","TRG","","","40","LOQ","YES",-99","","252.5","1.00","16",""  
"NAWC-110217-FRB-348","537","RES","320-33018-14","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA),"7.9","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES",-99","","252.5","1.00","7.9",""  
"NAWC-110217-FRB-348","537","RES","320-33018-14","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS),"12","ng/L","U","5.4","DL","","TRG","","","30","LOQ","YES",-99","","252.5","1.00","12",""  
"NAWC-110217-FRB-348","537","RES","320-33018-14","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS),"36","ng/L","U","16","DL","","TRG","","","89","LOQ","YES",-99","","252.5","1.00","36",""  
"NAWC-110217-FRB-348","537","RES","320-33018-14","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA),"4.0","ng/L","U","1.9","DL","","TRG","","","9.9","LOQ","YES",-99","","252.5","1.00","4.0",""  
"NAWC-110217-FRB-348","537","RES","320-33018-14","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA),"20","ng/L","U","7.9","DL","","TRG","","","24","LOQ","YES",-99","","252.5","1.00","20",""  
"NAWC-110217-FRB-348","537","RES","320-33018-14","TALSAC","STL00993","13C2  
PFHxA","36","ng/L","","-99","DL","","SURR","90","","-99","LOQ","YES","39.6","","252.5","1.00","0",""  
"NAWC-110217-FRB-348","537","RES","320-33018-14","TALSAC","STL00996","13C2  
PFDA","35","ng/L","","-99","DL","","SURR","88","","-99","LOQ","YES","39.6","","252.5","1.00","0",""  
"WGNA-110217-RW-3882","537","RES","320-33018-15","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS),"9.0","ng/L","J","6.8","DL","","TRG","","","40","LOQ","YES",-99","","250.9","1.00","16",""  
"WGNA-110217-RW-3882","537","RES","320-33018-15","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA),"7.1","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES",-99","","250.9","1.00","8.0",""  
"WGNA-110217-RW-3882","537","RES","320-33018-15","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS),"8.2","ng/L","J","5.5","DL","","TRG","","","30","LOQ","YES",-99","","250.9","1.00","12",""  
"WGNA-110217-RW-3882","537","RES","320-33018-15","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS),"36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES",-99","","250.9","1.00","36",""  
"WGNA-110217-RW-3882","537","RES","320-33018-15","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA),"3.7","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES",-99","","250.9","1.00","4.0",""  
"WGNA-110217-RW-3882","537","RES","320-33018-15","TALSAC","375-95-1","Perfluorononanoic acid

(PFNA)", "20", "ng/L", "U M", "8.0", "DL", "", "TRG", "", "", "24", "LOQ", "YES", "-99", "", "250.9", "1.00", "20", ""  
"WGNA-110217-RW-3882", "537", "RES", "320-33018-15", "TALSAC", "STL00993", "13C2  
PFHxA", "33", "ng/L", "", "-99", "DL", "", "SURRE", "83", "", "-99", "LOQ", "YES", "39.9", "", "250.9", "1.00", "0", ""  
"WGNA-110217-RW-3882", "537", "RES", "320-33018-15", "TALSAC", "STL00996", "13C2  
PFDA", "34", "ng/L", "", "-99", "DL", "", "SURRE", "84", "", "-99", "LOQ", "YES", "39.9", "", "250.9", "1.00", "0", ""  
"WGNA-110217-FRB-3882", "537", "RES", "320-33018-16", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid  
(PFOS)", "16", "ng/L", "U", "6.9", "DL", "", "TRG", "", "", "40", "LOQ", "YES", "-99", "", "247.9", "1.00", "16", ""  
"WGNA-110217-FRB-3882", "537", "RES", "320-33018-16", "TALSAC", "335-67-1", "Perfluorooctanoic acid  
(PFOA)", "8.1", "ng/L", "U", "2.8", "DL", "", "TRG", "", "", "20", "LOQ", "YES", "-99", "", "247.9", "1.00", "8.1", ""  
"WGNA-110217-FRB-3882", "537", "RES", "320-33018-16", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid  
(PFHxS)", "12", "ng/L", "U", "5.5", "DL", "", "TRG", "", "", "30", "LOQ", "YES", "-99", "", "247.9", "1.00", "12", ""  
"WGNA-110217-FRB-3882", "537", "RES", "320-33018-16", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid  
(PFBS)", "36", "ng/L", "U", "16", "DL", "", "TRG", "", "", "91", "LOQ", "YES", "-99", "", "247.9", "1.00", "36", ""  
"WGNA-110217-FRB-3882", "537", "RES", "320-33018-16", "TALSAC", "375-85-9", "Perfluoroheptanoic acid  
(PFHpA)", "4.0", "ng/L", "U", "1.9", "DL", "", "TRG", "", "", "10", "LOQ", "YES", "-99", "", "247.9", "1.00", "4.0", ""  
"WGNA-110217-FRB-3882", "537", "RES", "320-33018-16", "TALSAC", "375-95-1", "Perfluorononanoic acid  
(PFNA)", "20", "ng/L", "U", "8.1", "DL", "", "TRG", "", "", "24", "LOQ", "YES", "-99", "", "247.9", "1.00", "20", ""  
"WGNA-110217-FRB-3882", "537", "RES", "320-33018-16", "TALSAC", "STL00993", "13C2  
PFHxA", "34", "ng/L", "", "-99", "DL", "", "SURRE", "85", "", "-99", "LOQ", "YES", "40.3", "", "247.9", "1.00", "0", ""  
"WGNA-110217-FRB-3882", "537", "RES", "320-33018-16", "TALSAC", "STL00996", "13C2  
PFDA", "35", "ng/L", "", "-99", "DL", "", "SURRE", "86", "", "-99", "LOQ", "YES", "40.3", "", "247.9", "1.00", "0", ""  
"NAWC-110217-FRB-286", "537", "RES", "320-33018-2", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid  
(PFOS)", "16", "ng/L", "U", "7.0", "DL", "", "TRG", "", "", "41", "LOQ", "YES", "-99", "", "243.9", "1.00", "16", ""  
"NAWC-110217-FRB-286", "537", "RES", "320-33018-2", "TALSAC", "335-67-1", "Perfluorooctanoic acid  
(PFOA)", "8.2", "ng/L", "U", "2.9", "DL", "", "TRG", "", "", "21", "LOQ", "YES", "-99", "", "243.9", "1.00", "8.2", ""  
"NAWC-110217-FRB-286", "537", "RES", "320-33018-2", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid  
(PFHxS)", "12", "ng/L", "U", "5.6", "DL", "", "TRG", "", "", "31", "LOQ", "YES", "-99", "", "243.9", "1.00", "12", ""  
"NAWC-110217-FRB-286", "537", "RES", "320-33018-2", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid  
(PFBS)", "37", "ng/L", "U", "17", "DL", "", "TRG", "", "", "92", "LOQ", "YES", "-99", "", "243.9", "1.00", "37", ""  
"NAWC-110217-FRB-286", "537", "RES", "320-33018-2", "TALSAC", "375-85-9", "Perfluoroheptanoic acid  
(PFHpA)", "4.1", "ng/L", "U", "1.9", "DL", "", "TRG", "", "", "10", "LOQ", "YES", "-99", "", "243.9", "1.00", "4.1", ""  
"NAWC-110217-FRB-286", "537", "RES", "320-33018-2", "TALSAC", "375-95-1", "Perfluorononanoic acid  
(PFNA)", "21", "ng/L", "U", "8.2", "DL", "", "TRG", "", "", "25", "LOQ", "YES", "-99", "", "243.9", "1.00", "21", ""  
"NAWC-110217-FRB-286", "537", "RES", "320-33018-2", "TALSAC", "STL00993", "13C2  
PFHxA", "34", "ng/L", "", "-99", "DL", "", "SURRE", "84", "", "-99", "LOQ", "YES", "41.0", "", "243.9", "1.00", "0", ""  
"NAWC-110217-FRB-286", "537", "RES", "320-33018-2", "TALSAC", "STL00996", "13C2  
PFDA", "35", "ng/L", "", "-99", "DL", "", "SURRE", "85", "", "-99", "LOQ", "YES", "41.0", "", "243.9", "1.00", "0", ""  
"WGNA-110217-RW-3978", "537", "RES", "320-33018-3", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid  
(PFOS)", "22", "ng/L", "J M", "6.9", "DL", "", "TRG", "", "", "41", "LOQ", "YES", "-99", "", "245.7", "1.00", "16", ""  
"WGNA-110217-RW-3978", "537", "RES", "320-33018-3", "TALSAC", "335-67-1", "Perfluorooctanoic acid  
(PFOA)", "14", "ng/L", "J", "2.8", "DL", "", "TRG", "", "", "20", "LOQ", "YES", "-99", "", "245.7", "1.00", "8.1", ""  
"WGNA-110217-RW-3978", "537", "RES", "320-33018-3", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid  
(PFHxS)", "8.3", "ng/L", "J", "5.6", "DL", "", "TRG", "", "", "31", "LOQ", "YES", "-99", "", "245.7", "1.00", "12", ""  
"WGNA-110217-RW-3978", "537", "RES", "320-33018-3", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid  
(PFBS)", "37", "ng/L", "U", "16", "DL", "", "TRG", "", "", "92", "LOQ", "YES", "-99", "", "245.7", "1.00", "37", ""  
"WGNA-110217-RW-3978", "537", "RES", "320-33018-3", "TALSAC", "375-85-9", "Perfluoroheptanoic acid  
(PFHpA)", "6.5", "ng/L", "J", "1.9", "DL", "", "TRG", "", "", "10", "LOQ", "YES", "-99", "", "245.7", "1.00", "4.1", ""  
"WGNA-110217-RW-3978", "537", "RES", "320-33018-3", "TALSAC", "375-95-1", "Perfluorononanoic acid  
(PFNA)", "20", "ng/L", "U M", "8.1", "DL", "", "TRG", "", "", "24", "LOQ", "YES", "-99", "", "245.7", "1.00", "20", ""  
"WGNA-110217-RW-3978", "537", "RES", "320-33018-3", "TALSAC", "STL00993", "13C2  
PFHxA", "32", "ng/L", "", "-99", "DL", "", "SURRE", "78", "", "-99", "LOQ", "YES", "40.7", "", "245.7", "1.00", "0", ""  
"WGNA-110217-RW-3978", "537", "RES", "320-33018-3", "TALSAC", "STL00996", "13C2  
PFDA", "35", "ng/L", "", "-99", "DL", "", "SURRE", "85", "", "-99", "LOQ", "YES", "40.7", "", "245.7", "1.00", "0", ""  
"WGNA-110217-FRB-3978", "537", "RES", "320-33018-4", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid

(PFOS),"16","ng/L","U","6.9","DL","","TRG","","","40","LOQ","YES",-99","","247.4","1.00","16",""  
"WGNA-110217-FRB-3978","537","RES","320-33018-4","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA),"8.1","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES",-99","","247.4","1.00","8.1",""  
"WGNA-110217-FRB-3978","537","RES","320-33018-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS),"12","ng/L","U","5.6","DL","","TRG","","","30","LOQ","YES",-99","","247.4","1.00","12",""  
"WGNA-110217-FRB-3978","537","RES","320-33018-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS),"36","ng/L","U","16","DL","","TRG","","","91","LOQ","YES",-99","","247.4","1.00","36",""  
"WGNA-110217-FRB-3978","537","RES","320-33018-4","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA),"4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES",-99","","247.4","1.00","4.0",""  
"WGNA-110217-FRB-3978","537","RES","320-33018-4","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA),"20","ng/L","U","8.1","DL","","TRG","","","24","LOQ","YES",-99","","247.4","1.00","20",""  
"WGNA-110217-FRB-3978","537","RES","320-33018-4","TALSAC","STL00993","13C2  
PFHxA","33","ng/L","","-99","DL","","SURR","82","","-99","LOQ","YES","40.4","","247.4","1.00","0",""  
"WGNA-110217-FRB-3978","537","RES","320-33018-4","TALSAC","STL00996","13C2  
PFDA","36","ng/L","","-99","DL","","SURR","88","","-99","LOQ","YES","40.4","","247.4","1.00","0",""  
"NAWC-110217-RW-177-IRR","537","RES","320-33018-5","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS),"41","ng/L","M","7.0","DL","","TRG","","","41","LOQ","YES",-99","","243.1","1.00","16",""  
"NAWC-110217-RW-177-IRR","537","RES","320-33018-5","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA),"16","ng/L","J","2.9","DL","","TRG","","","21","LOQ","YES",-99","","243.1","1.00","8.2",""  
"NAWC-110217-RW-177-IRR","537","RES","320-33018-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS),"29","ng/L","J","5.7","DL","","TRG","","","31","LOQ","YES",-99","","243.1","1.00","12",""  
"NAWC-110217-RW-177-IRR","537","RES","320-33018-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS),"37","ng/L","U","17","DL","","TRG","","","93","LOQ","YES",-99","","243.1","1.00","37",""  
"NAWC-110217-RW-177-IRR","537","RES","320-33018-5","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA),"6.0","ng/L","J M","2.0","DL","","TRG","","","10","LOQ","YES",-99","","243.1","1.00","4.1",""  
"NAWC-110217-RW-177-IRR","537","RES","320-33018-5","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA),"21","ng/L","U M","8.2","DL","","TRG","","","25","LOQ","YES",-99","","243.1","1.00","21",""  
"NAWC-110217-RW-177-IRR","537","RES","320-33018-5","TALSAC","STL00993","13C2  
PFHxA","25","ng/L","Q","-99","DL","","SURR","60","","-99","LOQ","YES","41.1","","243.1","1.00","0",""  
"NAWC-110217-RW-177-IRR","537","RES","320-33018-5","TALSAC","STL00996","13C2  
PFDA","36","ng/L","","-99","DL","","SURR","88","","-99","LOQ","YES","41.1","","243.1","1.00","0",""  
"NAWC-110217-FRB-177-IRR","537","RES","320-33018-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS),"16","ng/L","U","6.9","DL","","TRG","","","41","LOQ","YES",-99","","246.3","1.00","16",""  
"NAWC-110217-FRB-177-IRR","537","RES","320-33018-6","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA),"8.1","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES",-99","","246.3","1.00","8.1",""  
"NAWC-110217-FRB-177-IRR","537","RES","320-33018-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS),"12","ng/L","U","5.6","DL","","TRG","","","30","LOQ","YES",-99","","246.3","1.00","12",""  
"NAWC-110217-FRB-177-IRR","537","RES","320-33018-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS),"37","ng/L","U","16","DL","","TRG","","","91","LOQ","YES",-99","","246.3","1.00","37",""  
"NAWC-110217-FRB-177-IRR","537","RES","320-33018-6","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA),"4.1","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES",-99","","246.3","1.00","4.1",""  
"NAWC-110217-FRB-177-IRR","537","RES","320-33018-6","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA),"20","ng/L","U","8.1","DL","","TRG","","","24","LOQ","YES",-99","","246.3","1.00","20",""  
"NAWC-110217-FRB-177-IRR","537","RES","320-33018-6","TALSAC","STL00993","13C2  
PFHxA","35","ng/L","","-99","DL","","SURR","87","","-99","LOQ","YES","40.6","","246.3","1.00","0",""  
"NAWC-110217-FRB-177-IRR","537","RES","320-33018-6","TALSAC","STL00996","13C2  
PFDA","36","ng/L","","-99","DL","","SURR","89","","-99","LOQ","YES","40.6","","246.3","1.00","0",""  
"NAWC-110217-RW-177-SHOP","537","RES","320-33018-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS),"21","ng/L","J","7.0","DL","","TRG","","","41","LOQ","YES",-99","","243.8","1.00","16",""  
"NAWC-110217-RW-177-SHOP","537","RES","320-33018-7","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA),"12","ng/L","J","2.9","DL","","TRG","","","21","LOQ","YES",-99","","243.8","1.00","8.2",""  
"NAWC-110217-RW-177-SHOP","537","RES","320-33018-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS),"14","ng/L","J","5.6","DL","","TRG","","","31","LOQ","YES",-99","","243.8","1.00","12",""  
"NAWC-110217-RW-177-SHOP","537","RES","320-33018-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid

(PFBS)","37","ng/L","U","17","DL","","","TRG","","","92","LOQ","YES","-99","","","243.8","1.00","37","","  
"NAWC-110217-RW-177-SHOP","537","RES","320-33018-7","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","4.1","ng/L","J","1.9","DL","","","TRG","","","10","LOQ","YES","-99","","","243.8","1.00","4.1","","  
"NAWC-110217-RW-177-SHOP","537","RES","320-33018-7","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","21","ng/L","U M","8.2","DL","","","TRG","","","25","LOQ","YES","-99","","","243.8","1.00","21","","  
"NAWC-110217-RW-177-SHOP","537","RES","320-33018-7","TALSAC","STL00993","13C2  
PFHxA","20","ng/L","Q","-99","DL","","","SURR","48","","","-99","LOQ","YES","41.0","","","243.8","1.00","0","","  
"NAWC-110217-RW-177-SHOP","537","RES","320-33018-7","TALSAC","STL00996","13C2  
PFDA","34","ng/L","","","-99","DL","","","SURR","84","","","-99","LOQ","YES","41.0","","","243.8","1.00","0","","  
"NAWC-110217-FRB-177-SHOP","537","RES","320-33018-8","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","16","ng/L","U","6.8","DL","","","TRG","","","40","LOQ","YES","-99","","","251.1","1.00","16","","  
"NAWC-110217-FRB-177-SHOP","537","RES","320-33018-8","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","8.0","ng/L","U","2.8","DL","","","TRG","","","20","LOQ","YES","-99","","","251.1","1.00","8.0","","  
"NAWC-110217-FRB-177-SHOP","537","RES","320-33018-8","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","12","ng/L","U","5.5","DL","","","TRG","","","30","LOQ","YES","-99","","","251.1","1.00","12","","  
"NAWC-110217-FRB-177-SHOP","537","RES","320-33018-8","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","36","ng/L","U","16","DL","","","TRG","","","90","LOQ","YES","-99","","","251.1","1.00","36","","  
"NAWC-110217-FRB-177-SHOP","537","RES","320-33018-8","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","4.0","ng/L","U","1.9","DL","","","TRG","","","10","LOQ","YES","-99","","","251.1","1.00","4.0","","  
"NAWC-110217-FRB-177-SHOP","537","RES","320-33018-8","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","20","ng/L","U","8.0","DL","","","TRG","","","24","LOQ","YES","-99","","","251.1","1.00","20","","  
"NAWC-110217-FRB-177-SHOP","537","RES","320-33018-8","TALSAC","STL00993","13C2  
PFHxA","33","ng/L","","","-99","DL","","","SURR","84","","","-99","LOQ","YES","39.8","","","251.1","1.00","0","","  
"NAWC-110217-FRB-177-SHOP","537","RES","320-33018-8","TALSAC","STL00996","13C2  
PFDA","35","ng/L","","","-99","DL","","","SURR","87","","","-99","LOQ","YES","39.8","","","251.1","1.00","0","","  
"NAWC-110217-RW-185","537","RES","320-33018-9","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","19","ng/L","J","6.8","DL","","","TRG","","","40","LOQ","YES","-99","","","249.1","1.00","16","","  
"NAWC-110217-RW-185","537","RES","320-33018-9","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","14","ng/L","J","2.8","DL","","","TRG","","","20","LOQ","YES","-99","","","249.1","1.00","8.0","","  
"NAWC-110217-RW-185","537","RES","320-33018-9","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","10","ng/L","J","5.5","DL","","","TRG","","","30","LOQ","YES","-99","","","249.1","1.00","12","","  
"NAWC-110217-RW-185","537","RES","320-33018-9","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","36","ng/L","U","16","DL","","","TRG","","","90","LOQ","YES","-99","","","249.1","1.00","36","","  
"NAWC-110217-RW-185","537","RES","320-33018-9","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","9.8","ng/L","J","1.9","DL","","","TRG","","","10","LOQ","YES","-99","","","249.1","1.00","4.0","","  
"NAWC-110217-RW-185","537","RES","320-33018-9","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","20","ng/L","U M","8.0","DL","","","TRG","","","24","LOQ","YES","-99","","","249.1","1.00","20","","  
"NAWC-110217-RW-185","537","RES","320-33018-9","TALSAC","STL00993","13C2  
PFHxA","31","ng/L","","","-99","DL","","","SURR","77","","","-99","LOQ","YES","40.1","","","249.1","1.00","0","","  
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(PFOS)","210","ng/L","M","6.8","DL","","","SPK","95","","","40","LOQ","YES","222","","","250.00","1.00","16","","  
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(PFOA)","105","ng/L","","","2.8","DL","","","SPK","94","","","20","LOQ","YES","111","","","250.00","1.00","8.0","","  
"LCS 320-193512/2-A","537","RES","LCS 320-193512/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","165","ng/L","","","5.5","DL","","","SPK","99","","","30","LOQ","YES","167","","","250.00","1.00","12","","  
"LCS 320-193512/2-A","537","RES","LCS 320-193512/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","473","ng/L","","","16","DL","","","SPK","95","","","90","LOQ","YES","500","","","250.00","1.00","36","","  
"LCS 320-193512/2-A","537","RES","LCS 320-193512/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","51.7","ng/L","","","1.9","DL","","","SPK","93","","","10","LOQ","YES","55.6","","","250.00","1.00","4.0","","  
"LCS 320-193512/2-A","537","RES","LCS 320-193512/2-A","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","103","ng/L","","","8.0","DL","","","SPK","93","","","24","LOQ","YES","111","","","250.00","1.00","20","","  
"LCS 320-193512/2-A","537","RES","LCS 320-193512/2-A","TALSAC","STL00993","13C2



PFHxA","35.5","ng/L","",-99","DL","","SURRE","89","",-99","LOQ","YES","40.0","","250.00","1.00","0",""  
"LCS 320-193512/2-A","537","RES","LCS 320-193512/2-A","TALSAC","STL00996","13C2  
PFDA","34.8","ng/L","",-99","DL","","SURRE","87","",-99","LOQ","YES","40.0","","250.00","1.00","0",""  
"LCSD 320-193512/3-A","537","RES","LCSD 320-193512/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic  
acid (PFOS)","215","ng/L","M","6.8","DL","","SPK","97","2","40","LOQ","YES","222","LCS 320-193512/2-  
A","250.00","1.00","16",""  
"LCSD 320-193512/3-A","537","RES","LCSD 320-193512/3-A","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","103","ng/L","","2.8","DL","","SPK","93","2","20","LOQ","YES","111","LCS 320-193512/2-  
A","250.00","1.00","8.0",""  
"LCSD 320-193512/3-A","537","RES","LCSD 320-193512/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic  
acid (PFHxS)","169","ng/L","","5.5","DL","","SPK","102","3","30","LOQ","YES","167","LCS 320-193512/2-  
A","250.00","1.00","12",""  
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(PFBS)","480","ng/L","","16","DL","","SPK","96","1","90","LOQ","YES","500","LCS 320-193512/2-  
A","250.00","1.00","36",""  
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(PFHpA)","52.2","ng/L","","1.9","DL","","SPK","94","1","10","LOQ","YES","55.6","LCS 320-193512/2-  
A","250.00","1.00","4.0",""  
"LCSD 320-193512/3-A","537","RES","LCSD 320-193512/3-A","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","106","ng/L","","8.0","DL","","SPK","95","2","24","LOQ","YES","111","LCS 320-193512/2-  
A","250.00","1.00","20",""  
"LCSD 320-193512/3-A","537","RES","LCSD 320-193512/3-A","TALSAC","STL00993","13C2  
PFHxA","34.6","ng/L","",-99","DL","","SURRE","87","",-99","LOQ","YES","40.0","LCS 320-193512/2-  
A","250.00","1.00","0",""  
"LCSD 320-193512/3-A","537","RES","LCSD 320-193512/3-A","TALSAC","STL00996","13C2  
PFDA","34.6","ng/L","",-99","DL","","SURRE","87","",-99","LOQ","YES","40.0","LCS 320-193512/2-  
A","250.00","1.00","0",""  
"MB 320-193512/1-A","537","RES","MB 320-193512/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250.00","1.00","16",""  
"MB 320-193512/1-A","537","RES","MB 320-193512/1-A","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250.00","1.00","8.0",""  
"MB 320-193512/1-A","537","RES","MB 320-193512/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250.00","1.00","12",""  
"MB 320-193512/1-A","537","RES","MB 320-193512/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250.00","1.00","36",""  
"MB 320-193512/1-A","537","RES","MB 320-193512/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250.00","1.00","4.0",""  
"MB 320-193512/1-A","537","RES","MB 320-193512/1-A","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250.00","1.00","20",""  
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1","NM","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017  
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10","FB","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017  
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194251","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""  
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11","NM","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017  
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194251","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""  
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12","FB","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017  
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194251","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""  
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13","NM","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017  
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14","FB","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017  
04:15","TALSAC","COA","WET","NA","1","NA","NA","","100","320-193512","320-193512","NA","320-  
194251","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""  
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15","NM","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017  
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194241","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""  
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5","NM","","3.2","537","METHOD","RES","11/08/2017 11:47","11/13/2017  
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194241","320-33018-1","11/03/2017 09:40","11/20/2017 13:54",""  
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194241","320-33018-1","11/08/2017 11:47","11/20/2017 13:54",""



**TETRA TECH**

**INTERNAL CORRESPONDENCE**

**TO:** A. FREBOWITZ **DATE:** NOVEMBER 30, 2017  
**FROM:** TERRI L. SOLOMON **COPIES:** DV FILE  
**SUBJECT:** ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)  
NAS JRB WILLOW GROVE  
SAMPLE DELIVERY GROUP (SDG) 320-33018-1

**SAMPLES:** 8/Field Reagent Blank (FRB)  
NAWC-110217-FRB-177-IRR NAWC-110217-FRB-177-SHOP  
NAWC-110217-FRB-185 NAWC-110217-FRB-286  
NAWC-110217-FRB-348 NAWC-110217-FRB-355  
WGNA-110217-FRB-3882 WGNA-110217-FRB-3978

8/Drinking Water  
NAWC-110217-RW-177-IRR NAWC-110217-RW-177-SHOP  
NAWC-110217-RW-185 NAWC-110217-RW-286  
NAWC-110217-RW-348 NAWC-110217-RW-355  
WGNA-110217-RW-3882 WGNA-110217-RW-3978

Overview

The sample set for NAS JRB Willow Grove, SDG 320-33018-1, consisted of eight (8) drinking water samples and eight (8) FRB samples. All samples were analyzed for select perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA) and perfluorooctane sulfonic acid (PFOS). No field duplicate sample pairs were included in this SDG.

The samples were collected by Tetra Tech on November 2, 2017 and analyzed by Test America-Sacramento. All sample analyses were conducted in accordance with EPA Method 537 version 1.1 analytical and reporting protocols.

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

Major

None.

TO: A. FREBOWITZ  
SDG: 320-33018-1

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#### Minor

The following surrogate recoveries were below the 70% quality control limit. The samples were reanalyzed by the laboratory with similar recoveries and the original analyses were reported. The detected and nondetected results reported in the affected samples were qualified as estimated (J) and (UJ), respectively.

| <u>Sample</u>           | <u>Surrogate</u>            |
|-------------------------|-----------------------------|
| NAWC-110217-RW-177-IRR  | 13C2 Perfluorohexanoic acid |
| NAWC-110217-RW-177-SHOP | 13C2 Perfluorohexanoic acid |

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

#### Notes

It was noted by the laboratory that sample container label (NAWC-110217-FRB-IRR) did not match the chain of custody sample ID (NAWC-110217-FRB-177-IRR). The chain of custody sample ID was used by the laboratory.

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

| <u>Sample</u>           | <u>Associated FRB</u>    |
|-------------------------|--------------------------|
| NAWC-110217-RW-177-IRR  | NAWC-110217-FRB-177-IRR  |
| NAWC-110217-RW-177-SHOP | NAWC-110217-FRB-177-SHOP |
| NAWC-110217-RW-185      | NAWC-110217-FRB-185      |
| NAWC-110217-RW-286      | NAWC-110217-FRB-286      |
| NAWC-110217-RW-348      | NAWC-110217-FRB-348      |
| NAWC-110217-RW-355      | NAWC-110217-FRB-355      |
| WGNA-110217-RW-3882     | WGNA-110217-FRB-3882     |
| WGNA-110217-RW-3978     | WGNA-110217-FRB-3978     |

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

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

#### Executive Summary

**Laboratory Performance:** Two surrogate recoveries were below the quality control limit.

**Other Factors Affecting Data Quality:** Results below the RL were estimated.

The data for these analyses were reviewed with reference to the Environmental Protection Agency document EPA/600/R-08/092, Method 537, "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)", (September 2009) and the US EPA National Functional Guidelines for Organic Data Review (January 2017) as applicable. The text of this report has been formulated to address only those areas affecting data quality.

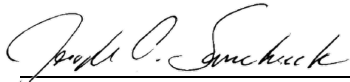
TO: A. FREBOWITZ  
SDG: 320-33018-1

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



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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.

|           |                                                                                                                                                                                                                                                                                                                    |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>U</b>  | The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method.                                                                                                                                                     |
| <b>J</b>  | The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit). |
| <b>J+</b> | The result is an estimated quantity, but the result may be biased high.                                                                                                                                                                                                                                            |
| <b>J-</b> | The result is an estimated quantity, but the result may be biased low.                                                                                                                                                                                                                                             |
| <b>UJ</b> | The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.                                                                                                                                                                                |
| <b>R</b>  | 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.                                                                                                                                      |
| <b>UR</b> | The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.                                                                                                                                   |

## **Appendix A**

### Qualified Analytical Results



**Qualifier Codes:**

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

|                                                                                                       |            |                         |     |      |                          |     |      |                     |     |      |                     |     |      |
|-------------------------------------------------------------------------------------------------------|------------|-------------------------|-----|------|--------------------------|-----|------|---------------------|-----|------|---------------------|-----|------|
| <b>PROJ_NO: 08005-WE04</b><br><b>SDG: 320-33018-1</b><br><b>FRACTION: PFAS</b><br><b>MEDIA: WATER</b> | NSAMPLE    | NAWC-110217-FRB-177-IRR |     |      | NAWC-110217-FRB-177-SHOP |     |      | NAWC-110217-FRB-185 |     |      | NAWC-110217-FRB-286 |     |      |
|                                                                                                       | LAB_ID     | 320-33018-6             |     |      | 320-33018-8              |     |      | 320-33018-10        |     |      | 320-33018-2         |     |      |
|                                                                                                       | SAMP_DATE  | 11/2/2017               |     |      | 11/2/2017                |     |      | 11/2/2017           |     |      | 11/2/2017           |     |      |
|                                                                                                       | QC_TYPE    | FB                      |     |      | FB                       |     |      | FB                  |     |      | FB                  |     |      |
|                                                                                                       | UNITS      | NG/L                    |     |      | NG/L                     |     |      | NG/L                |     |      | NG/L                |     |      |
|                                                                                                       | PCT_SOLIDS | 0.0                     |     |      | 0.0                      |     |      | 0.0                 |     |      | 0.0                 |     |      |
|                                                                                                       | DUP_OF     |                         |     |      |                          |     |      |                     |     |      |                     |     |      |
| PARAMETER                                                                                             |            | RESULT                  | VQL | QLCD | RESULT                   | VQL | QLCD | RESULT              | VQL | QLCD | RESULT              | VQL | QLCD |
| PENTADECAFLUOROOCTANOIC ACID                                                                          |            | 8.1 U                   |     |      | 8 U                      |     |      | 8 U                 |     |      | 8.2 U               |     |      |
| PERFLUOROBUTANESULFONIC ACID                                                                          |            | 37 U                    |     |      | 36 U                     |     |      | 36 U                |     |      | 37 U                |     |      |
| PERFLUOROHEPTANOIC ACID                                                                               |            | 4.1 U                   |     |      | 4 U                      |     |      | 4 U                 |     |      | 4.1 U               |     |      |
| PERFLUOROHEXANESULFONIC ACID                                                                          |            | 12 U                    |     |      | 12 U                     |     |      | 12 U                |     |      | 12 U                |     |      |
| PERFLUORONONANOIC ACID                                                                                |            | 20 U                    |     |      | 20 U                     |     |      | 20 U                |     |      | 21 U                |     |      |
| PERFLUOROOCTANE SULFONIC ACID                                                                         |            | 16 U                    |     |      | 16 U                     |     |      | 16 U                |     |      | 16 U                |     |      |

|                                                                                                       |            |                     |     |      |                     |     |      |                        |     |      |                         |     |      |
|-------------------------------------------------------------------------------------------------------|------------|---------------------|-----|------|---------------------|-----|------|------------------------|-----|------|-------------------------|-----|------|
| <b>PROJ_NO: 08005-WE04</b><br><b>SDG: 320-33018-1</b><br><b>FRACTION: PFAS</b><br><b>MEDIA: WATER</b> | NSAMPLE    | NAWC-110217-FRB-348 |     |      | NAWC-110217-FRB-355 |     |      | NAWC-110217-RW-177-IRR |     |      | NAWC-110217-RW-177-SHOP |     |      |
|                                                                                                       | LAB_ID     | 320-33018-14        |     |      | 320-33018-12        |     |      | 320-33018-5            |     |      | 320-33018-7             |     |      |
|                                                                                                       | SAMP_DATE  | 11/2/2017           |     |      | 11/2/2017           |     |      | 11/2/2017              |     |      | 11/2/2017               |     |      |
|                                                                                                       | QC_TYPE    | FB                  |     |      | FB                  |     |      | NM                     |     |      | NM                      |     |      |
|                                                                                                       | UNITS      | NG/L                |     |      | NG/L                |     |      | NG/L                   |     |      | NG/L                    |     |      |
|                                                                                                       | PCT_SOLIDS | 0.0                 |     |      | 0.0                 |     |      | 0.0                    |     |      | 0.0                     |     |      |
|                                                                                                       | DUP_OF     |                     |     |      |                     |     |      |                        |     |      |                         |     |      |
| PARAMETER                                                                                             |            | RESULT              | VQL | QLCD | RESULT              | VQL | QLCD | RESULT                 | VQL | QLCD | RESULT                  | VQL | QLCD |
| PENTADECAFLUOROOCTANOIC ACID                                                                          |            | 7.9                 | U   |      | 8.2                 | U   |      | 16                     | J   | PR   | 12                      | J   | PR   |
| PERFLUOROBUTANESULFONIC ACID                                                                          |            | 36                  | U   |      | 37                  | U   |      | 37                     | UJ  | R    | 37                      | UJ  | R    |
| PERFLUOROHEPTANOIC ACID                                                                               |            | 4                   | U   |      | 4.1                 | U   |      | 6                      | J   | PR   | 4.1                     | J   | PR   |
| PERFLUOROHXANESULFONIC ACID                                                                           |            | 12                  | U   |      | 12                  | U   |      | 29                     | J   | PR   | 14                      | J   | PR   |
| PERFLUORONONANOIC ACID                                                                                |            | 20                  | U   |      | 20                  | U   |      | 21                     | UJ  | R    | 21                      | UJ  | R    |
| PERFLUOROOCTANE SULFONIC ACID                                                                         |            | 16                  | U   |      | 16                  | U   |      | 41                     | J   | R    | 21                      | J   | PR   |

|                                                                                                       |            |                    |     |      |                    |     |      |                    |     |      |                    |     |      |
|-------------------------------------------------------------------------------------------------------|------------|--------------------|-----|------|--------------------|-----|------|--------------------|-----|------|--------------------|-----|------|
| <b>PROJ_NO: 08005-WE04</b><br><b>SDG: 320-33018-1</b><br><b>FRACTION: PFAS</b><br><b>MEDIA: WATER</b> | NSAMPLE    | NAWC-110217-RW-185 |     |      | NAWC-110217-RW-286 |     |      | NAWC-110217-RW-348 |     |      | NAWC-110217-RW-355 |     |      |
|                                                                                                       | LAB_ID     | 320-33018-9        |     |      | 320-33018-1        |     |      | 320-33018-13       |     |      | 320-33018-11       |     |      |
|                                                                                                       | SAMP_DATE  | 11/2/2017          |     |      | 11/2/2017          |     |      | 11/2/2017          |     |      | 11/2/2017          |     |      |
|                                                                                                       | QC_TYPE    | NM                 |     |      | NM                 |     |      | NM                 |     |      | NM                 |     |      |
|                                                                                                       | UNITS      | NG/L               |     |      | NG/L               |     |      | NG/L               |     |      | NG/L               |     |      |
|                                                                                                       | PCT_SOLIDS | 0.0                |     |      | 0.0                |     |      | 0.0                |     |      | 0.0                |     |      |
|                                                                                                       | DUP_OF     |                    |     |      |                    |     |      |                    |     |      |                    |     |      |
| PARAMETER                                                                                             |            | RESULT             | VQL | QLCD | RESULT             | VQL | QLCD | RESULT             | VQL | QLCD | RESULT             | VQL | QLCD |
| PENTADECAFLUOROOCTANOIC ACID                                                                          |            | 14                 | J   | P    | 16                 | J   | P    | 19                 | J   | P    | 7.8                | J   | P    |
| PERFLUOROBUTANESULFONIC ACID                                                                          |            | 36                 | U   |      | 37                 | U   |      | 36                 | U   |      | 36                 | U   |      |
| PERFLUOROHEPTANOIC ACID                                                                               |            | 9.8                | J   | P    | 3.9                | J   | P    | 4.7                | J   | P    | 2.3                | J   | P    |
| PERFLUOROHEXANESULFONIC ACID                                                                          |            | 10                 | J   | P    | 6.5                | J   | P    | 10                 | J   | P    | 6.1                | J   | P    |
| PERFLUORONONANOIC ACID                                                                                |            | 20                 | U   |      | 21                 | U   |      | 20                 | U   |      | 20                 | U   |      |
| PERFLUOROOCTANE SULFONIC ACID                                                                         |            | 19                 | J   | P    | 21                 | J   | P    | 33                 | J   | P    | 9.2                | J   | P    |

|                                                                                                       |            |                      |     |      |                      |     |      |                     |     |      |                     |     |      |
|-------------------------------------------------------------------------------------------------------|------------|----------------------|-----|------|----------------------|-----|------|---------------------|-----|------|---------------------|-----|------|
| <b>PROJ_NO: 08005-WE04</b><br><b>SDG: 320-33018-1</b><br><b>FRACTION: PFAS</b><br><b>MEDIA: WATER</b> | NSAMPLE    | WGNA-110217-FRB-3882 |     |      | WGNA-110217-FRB-3978 |     |      | WGNA-110217-RW-3882 |     |      | WGNA-110217-RW-3978 |     |      |
|                                                                                                       | LAB_ID     | 320-33018-16         |     |      | 320-33018-4          |     |      | 320-33018-15        |     |      | 320-33018-3         |     |      |
|                                                                                                       | SAMP_DATE  | 11/2/2017            |     |      | 11/2/2017            |     |      | 11/2/2017           |     |      | 11/2/2017           |     |      |
|                                                                                                       | QC_TYPE    | FB                   |     |      | FB                   |     |      | NM                  |     |      | NM                  |     |      |
|                                                                                                       | UNITS      | NG/L                 |     |      | NG/L                 |     |      | NG/L                |     |      | NG/L                |     |      |
|                                                                                                       | PCT_SOLIDS | 0.0                  |     |      | 0.0                  |     |      | 0.0                 |     |      | 0.0                 |     |      |
|                                                                                                       | DUP_OF     |                      |     |      |                      |     |      |                     |     |      |                     |     |      |
| PARAMETER                                                                                             |            | RESULT               | VQL | QLCD | RESULT               | VQL | QLCD | RESULT              | VQL | QLCD | RESULT              | VQL | QLCD |
| PENTADECAFLUOROOCTANOIC ACID                                                                          |            | 8.1                  | U   |      | 8.1                  | U   |      | 7.1                 | J   | P    | 14                  | J   | P    |
| PERFLUOROBUTANESULFONIC ACID                                                                          |            | 36                   | U   |      | 36                   | U   |      | 36                  | U   |      | 37                  | U   |      |
| PERFLUOROHEPTANOIC ACID                                                                               |            | 4                    | U   |      | 4                    | U   |      | 3.7                 | J   | P    | 6.5                 | J   | P    |
| PERFLUOROHXANESULFONIC ACID                                                                           |            | 12                   | U   |      | 12                   | U   |      | 8.2                 | J   | P    | 8.3                 | J   | P    |
| PERFLUORONONANOIC ACID                                                                                |            | 20                   | U   |      | 20                   | U   |      | 20                  | U   |      | 20                  | U   |      |
| PERFLUOROOCTANE SULFONIC ACID                                                                         |            | 16                   | U   |      | 16                   | U   |      | 9                   | J   | P    | 22                  | J   | P    |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                             |                                              |
|---------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>     | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                              |                                              |
| Client Sample ID: <u>NAWC-110217-RW-286</u> | Lab Sample ID: <u>320-33018-1</u>            |
| Matrix: <u>Water</u>                        | Lab File ID: <u>2017.11.13_537A_010.d</u>    |
| Analysis Method: <u>537</u>                 | Date Collected: <u>11/02/2017 08:10</u>      |
| Extraction Method: <u>537</u>               | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>242.3 (mL)</u>            | Date Analyzed: <u>11/13/2017 03:05</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>         | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>             | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                           | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194241</u>           | Units: <u>ng/L</u>                           |

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

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

*Teri L. Salaman*  
11/30/2017

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-FRB-286 Lab Sample ID: 320-33018-2  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_011.d  
 Analysis Method: 537 Date Collected: 11/02/2017 08:05  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 243.9(mL) Date Analyzed: 11/13/2017 03:09  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194241 Units: ng/L

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

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

*Wesley L. Salzman*  
11/30/2017

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                             |
|----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-33018-1</u>                 |
| SDG No.: _____                               |                                             |
| Client Sample ID: <u>WGNA-110217-RW-3978</u> | Lab Sample ID: <u>320-33018-3</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2017.11.13_537A_012.d</u>   |
| Analysis Method: <u>537</u>                  | Date Collected: <u>11/02/2017 08:40</u>     |
| Extraction Method: <u>537</u>                | Date Extracted: <u>11/08/2017 11:47</u>     |
| Sample wt/vol: <u>245.7(mL)</u>              | Date Analyzed: <u>11/13/2017 03:14</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>           | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>194241</u>            | Units: <u>ng/L</u>                          |

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

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

*Steve L. Salzman*  
11/30/2017



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-110217-FRB-3978 Lab Sample ID: 320-33018-4  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_013.d  
 Analysis Method: 537 Date Collected: 11/02/2017 08:35  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 247.4 (mL) Date Analyzed: 11/13/2017 03:19  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194241 Units: ng/L

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

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

*Wesley L. Salaman*  
11/30/2017

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-RW-177-IRR Lab Sample ID: 320-33018-5  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_014.d  
 Analysis Method: 537 Date Collected: 11/02/2017 09:10  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 243.1 (mL) Date Analyzed: 11/13/2017 03:24  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194241 Units: ng/L

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

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

*Steve L. Selman*  
11/30/2017

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-FRB-177-IRR Lab Sample ID: 320-33018-6  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_015.d  
 Analysis Method: 537 Date Collected: 11/02/2017 09:05  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 246.3 (mL) Date Analyzed: 11/13/2017 03:28  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194241 Units: ng/L

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

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

*Ami L. Salomon*  
11/30/2017

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-RW-177-SHOP Lab Sample ID: 320-33018-7  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_016.d  
 Analysis Method: 537 Date Collected: 11/02/2017 09:20  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 243.8 (mL) Date Analyzed: 11/13/2017 03:33  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194241 Units: ng/L

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

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

*Teri L. Selman*  
11/30/2017

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-FRB-177-SHOP Lab Sample ID: 320-33018-8  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_019.d  
 Analysis Method: 537 Date Collected: 11/02/2017 09:15  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 251.1 (mL) Date Analyzed: 11/13/2017 03:47  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194251 Units: ng/L

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

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

*Wesley L. Salmeron*  
11/30/2017

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-RW-185 Lab Sample ID: 320-33018-9  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_020.d  
 Analysis Method: 537 Date Collected: 11/02/2017 10:10  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 249.1 (mL) Date Analyzed: 11/13/2017 03:52  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194251 Units: ng/L

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

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

*Ali L. Salem*  
11/30/2017

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-FRB-185 Lab Sample ID: 320-33018-10  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_021.d  
 Analysis Method: 537 Date Collected: 11/02/2017 10:05  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 250.6(mL) Date Analyzed: 11/13/2017 03:56  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194251 Units: ng/L

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

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

*Ali L. Salameh*  
11/30/2017

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-RW-355 Lab Sample ID: 320-33018-11  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_022.d  
 Analysis Method: 537 Date Collected: 11/02/2017 10:40  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 249.3 (mL) Date Analyzed: 11/13/2017 04:01  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194251 Units: ng/L

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

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

*Ali L. Salameh*  
11/30/2017



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-FRB-355 Lab Sample ID: 320-33018-12  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_023.d  
 Analysis Method: 537 Date Collected: 11/02/2017 10:35  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 245.2 (mL) Date Analyzed: 11/13/2017 04:06  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194251 Units: ng/L

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

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

*Steve L. Selman*  
11/30/2017

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                             |                                              |
|---------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>     | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                              |                                              |
| Client Sample ID: <u>NAWC-110217-RW-348</u> | Lab Sample ID: <u>320-33018-13</u>           |
| Matrix: <u>Water</u>                        | Lab File ID: <u>2017.11.13_537A_024.d</u>    |
| Analysis Method: <u>537</u>                 | Date Collected: <u>11/02/2017 11:40</u>      |
| Extraction Method: <u>537</u>               | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>250.3 (mL)</u>            | Date Analyzed: <u>11/13/2017 04:10</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>         | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>             | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                           | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194251</u>           | Units: <u>ng/L</u>                           |

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

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

*Ali L. Salameh*  
11/30/2017

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-FRB-348 Lab Sample ID: 320-33018-14  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_025.d  
 Analysis Method: 537 Date Collected: 11/02/2017 11:35  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 252.5 (mL) Date Analyzed: 11/13/2017 04:15  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194251 Units: ng/L

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

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 90   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 88   |   | 70-130 |

*Ali L. Salameh*  
11/30/2017

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                             |
|----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-33018-1</u>                 |
| SDG No.: _____                               |                                             |
| Client Sample ID: <u>WGNA-110217-RW-3882</u> | Lab Sample ID: <u>320-33018-15</u>          |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2017.11.13_537A_026.d</u>   |
| Analysis Method: <u>537</u>                  | Date Collected: <u>11/02/2017 15:40</u>     |
| Extraction Method: <u>537</u>                | Date Extracted: <u>11/08/2017 11:47</u>     |
| Sample wt/vol: <u>250.9(mL)</u>              | Date Analyzed: <u>11/13/2017 04:20</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>           | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>194251</u>            | Units: <u>ng/L</u>                          |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q              | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|----------------|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 9.0    | J              | 40  | 16  | 6.8 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.1    | J              | 20  | 8.0 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U <del>M</del> | 24  | 20  | 8.0 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 8.2    | J              | 30  | 12  | 5.5 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 3.7    | J              | 10  | 4.0 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 36     | U              | 90  | 36  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 83   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 84   |   | 70-130 |

*Ali L. Salaman*  
11/30/2017

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-110217-FRB-3882 Lab Sample ID: 320-33018-16  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_027.d  
 Analysis Method: 537 Date Collected: 11/02/2017 15:35  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 247.9(mL) Date Analyzed: 11/13/2017 04:24  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194251 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 40  | 16  | 6.9 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 8.1    | U | 20  | 8.1 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 8.1 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 30  | 12  | 5.5 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 4.0    | U | 10  | 4.0 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 36     | U | 91  | 36  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 85   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 86   |   | 70-130 |

*Wesley L. Salmeron*  
11/30/2017

## **Appendix B**

Results as Reported by the Laboratory

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                             |                                              |
|---------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>     | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                              |                                              |
| Client Sample ID: <u>NAWC-110217-RW-286</u> | Lab Sample ID: <u>320-33018-1</u>            |
| Matrix: <u>Water</u>                        | Lab File ID: <u>2017.11.13_537A_010.d</u>    |
| Analysis Method: <u>537</u>                 | Date Collected: <u>11/02/2017 08:10</u>      |
| Extraction Method: <u>537</u>               | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>242.3 (mL)</u>            | Date Analyzed: <u>11/13/2017 03:05</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>         | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>             | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                           | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194241</u>           | Units: <u>ng/L</u>                           |

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

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                              |
|----------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                               |                                              |
| Client Sample ID: <u>NAWC-110217-FRB-286</u> | Lab Sample ID: <u>320-33018-2</u>            |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2017.11.13_537A_011.d</u>    |
| Analysis Method: <u>537</u>                  | Date Collected: <u>11/02/2017 08:05</u>      |
| Extraction Method: <u>537</u>                | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>243.9 (mL)</u>             | Date Analyzed: <u>11/13/2017 03:09</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>          | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>              | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194241</u>            | Units: <u>ng/L</u>                           |

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

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



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                             |
|----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-33018-1</u>                 |
| SDG No.: _____                               |                                             |
| Client Sample ID: <u>WGNA-110217-RW-3978</u> | Lab Sample ID: <u>320-33018-3</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2017.11.13_537A_012.d</u>   |
| Analysis Method: <u>537</u>                  | Date Collected: <u>11/02/2017 08:40</u>     |
| Extraction Method: <u>537</u>                | Date Extracted: <u>11/08/2017 11:47</u>     |
| Sample wt/vol: <u>245.7(mL)</u>              | Date Analyzed: <u>11/13/2017 03:14</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>           | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>194241</u>            | Units: <u>ng/L</u>                          |

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

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                               |                                              |
|-----------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>       | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                                |                                              |
| Client Sample ID: <u>WGNA-110217-FRB-3978</u> | Lab Sample ID: <u>320-33018-4</u>            |
| Matrix: <u>Water</u>                          | Lab File ID: <u>2017.11.13_537A_013.d</u>    |
| Analysis Method: <u>537</u>                   | Date Collected: <u>11/02/2017 08:35</u>      |
| Extraction Method: <u>537</u>                 | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>247.4 (mL)</u>              | Date Analyzed: <u>11/13/2017 03:19</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>           | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                             | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194241</u>             | Units: <u>ng/L</u>                           |

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

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-RW-177-IRR Lab Sample ID: 320-33018-5  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_014.d  
 Analysis Method: 537 Date Collected: 11/02/2017 09:10  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 243.1 (mL) Date Analyzed: 11/13/2017 03:24  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194241 Units: ng/L

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

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-FRB-177-IRR Lab Sample ID: 320-33018-6  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_015.d  
 Analysis Method: 537 Date Collected: 11/02/2017 09:05  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 246.3(mL) Date Analyzed: 11/13/2017 03:28  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194241 Units: ng/L

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

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                                  |                                              |
|--------------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>          | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                                   |                                              |
| Client Sample ID: <u>NAWC-110217-RW-177-SHOP</u> | Lab Sample ID: <u>320-33018-7</u>            |
| Matrix: <u>Water</u>                             | Lab File ID: <u>2017.11.13_537A_016.d</u>    |
| Analysis Method: <u>537</u>                      | Date Collected: <u>11/02/2017 09:20</u>      |
| Extraction Method: <u>537</u>                    | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>243.8 (mL)</u>                 | Date Analyzed: <u>11/13/2017 03:33</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>              | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>                  | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                                | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194241</u>                | Units: <u>ng/L</u>                           |

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

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-FRB-177-SHOP Lab Sample ID: 320-33018-8  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_019.d  
 Analysis Method: 537 Date Collected: 11/02/2017 09:15  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 251.1 (mL) Date Analyzed: 11/13/2017 03:47  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194251 Units: ng/L

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

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-RW-185 Lab Sample ID: 320-33018-9  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_020.d  
 Analysis Method: 537 Date Collected: 11/02/2017 10:10  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 249.1 (mL) Date Analyzed: 11/13/2017 03:52  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194251 Units: ng/L

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

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                             |
|----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-33018-1</u>                 |
| SDG No.: _____                               |                                             |
| Client Sample ID: <u>NAWC-110217-FRB-185</u> | Lab Sample ID: <u>320-33018-10</u>          |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2017.11.13_537A_021.d</u>   |
| Analysis Method: <u>537</u>                  | Date Collected: <u>11/02/2017 10:05</u>     |
| Extraction Method: <u>537</u>                | Date Extracted: <u>11/08/2017 11:47</u>     |
| Sample wt/vol: <u>250.6(mL)</u>              | Date Analyzed: <u>11/13/2017 03:56</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>           | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>194251</u>            | Units: <u>ng/L</u>                          |

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

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



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                             |                                              |
|---------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>     | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                              |                                              |
| Client Sample ID: <u>NAWC-110217-RW-355</u> | Lab Sample ID: <u>320-33018-11</u>           |
| Matrix: <u>Water</u>                        | Lab File ID: <u>2017.11.13_537A_022.d</u>    |
| Analysis Method: <u>537</u>                 | Date Collected: <u>11/02/2017 10:40</u>      |
| Extraction Method: <u>537</u>               | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>249.3 (mL)</u>            | Date Analyzed: <u>11/13/2017 04:01</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>         | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>             | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                           | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194251</u>           | Units: <u>ng/L</u>                           |

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

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-110217-FRB-355 Lab Sample ID: 320-33018-12  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_023.d  
 Analysis Method: 537 Date Collected: 11/02/2017 10:35  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 245.2 (mL) Date Analyzed: 11/13/2017 04:06  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194251 Units: ng/L

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

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                             |                                             |
|---------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>     | Job No.: <u>320-33018-1</u>                 |
| SDG No.: _____                              |                                             |
| Client Sample ID: <u>NAWC-110217-RW-348</u> | Lab Sample ID: <u>320-33018-13</u>          |
| Matrix: <u>Water</u>                        | Lab File ID: <u>2017.11.13_537A_024.d</u>   |
| Analysis Method: <u>537</u>                 | Date Collected: <u>11/02/2017 11:40</u>     |
| Extraction Method: <u>537</u>               | Date Extracted: <u>11/08/2017 11:47</u>     |
| Sample wt/vol: <u>250.3(mL)</u>             | Date Analyzed: <u>11/13/2017 04:10</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>          | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>              | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                           | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>194251</u>           | Units: <u>ng/L</u>                          |

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

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                              |
|----------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                               |                                              |
| Client Sample ID: <u>NAWC-110217-FRB-348</u> | Lab Sample ID: <u>320-33018-14</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2017.11.13_537A_025.d</u>    |
| Analysis Method: <u>537</u>                  | Date Collected: <u>11/02/2017 11:35</u>      |
| Extraction Method: <u>537</u>                | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>252.5 (mL)</u>             | Date Analyzed: <u>11/13/2017 04:15</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>          | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>              | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194251</u>            | Units: <u>ng/L</u>                           |

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

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 90   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 88   |   | 70-130 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-110217-RW-3882 Lab Sample ID: 320-33018-15  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_026.d  
 Analysis Method: 537 Date Collected: 11/02/2017 15:40  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 250.9(mL) Date Analyzed: 11/13/2017 04:20  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194251 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q   | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|-----|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 9.0    | J   | 40  | 16  | 6.8 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.1    | J   | 20  | 8.0 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U M | 24  | 20  | 8.0 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 8.2    | J   | 30  | 12  | 5.5 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 3.7    | J   | 10  | 4.0 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 36     | U   | 90  | 36  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 83   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 84   |   | 70-130 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                               |                                              |
|-----------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>       | Job No.: <u>320-33018-1</u>                  |
| SDG No.: _____                                |                                              |
| Client Sample ID: <u>WGNA-110217-FRB-3882</u> | Lab Sample ID: <u>320-33018-16</u>           |
| Matrix: <u>Water</u>                          | Lab File ID: <u>2017.11.13_537A_027.d</u>    |
| Analysis Method: <u>537</u>                   | Date Collected: <u>11/02/2017 15:35</u>      |
| Extraction Method: <u>537</u>                 | Date Extracted: <u>11/08/2017 11:47</u>      |
| Sample wt/vol: <u>247.9 (mL)</u>              | Date Analyzed: <u>11/13/2017 04:24</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>           | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                             | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>194251</u>             | Units: <u>ng/L</u>                           |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 40  | 16  | 6.9 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 8.1    | U | 20  | 8.1 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 8.1 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 30  | 12  | 5.5 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 4.0    | U | 10  | 4.0 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 36     | U | 91  | 36  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 85   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 86   |   | 70-130 |

## **Appendix C**

Support Documentation

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

# Chain of Custody Record

TestAmerica  
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

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

|                                                                                                                                                                                                                                  |             |                                                                              |                              |                             |            |                                 |                      |                        |                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------|------------------------------|-----------------------------|------------|---------------------------------|----------------------|------------------------|------------------------|
| Client Contact                                                                                                                                                                                                                   |             | Project Manager: Andy Frebowitz                                              |                              | Site Contact: Mary Kay Bond |            | Date: 11/2/2017                 |                      | COC No:                |                        |
| TetraTech                                                                                                                                                                                                                        |             | Tel/Fax: 610.382.1170                                                        |                              | Lab Contact: Dave Alltucker |            | Carrier: FedEx                  |                      | 1 of 1 COCs            |                        |
| 234 Mall Boulevard Suite 260                                                                                                                                                                                                     |             | Analysis Turnaround Time                                                     |                              |                             |            |                                 |                      | Sampler: Mary Kay Bond |                        |
| King of Prussia, PA 19406                                                                                                                                                                                                        |             | <input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS |                              |                             |            |                                 |                      | For Lab Use Only:      |                        |
| 610-382-1174                                                                                                                                                                                                                     |             | TAT if different from Below 21                                               |                              |                             |            |                                 |                      | Walk-in Client:        |                        |
| 610-491-9688                                                                                                                                                                                                                     |             | <input type="checkbox"/> 2 weeks                                             |                              |                             |            |                                 |                      | Lab Sampling:          |                        |
| Project Name: WE04                                                                                                                                                                                                               |             | <input type="checkbox"/> 1 week                                              |                              |                             |            |                                 |                      |                        |                        |
| Site: WE04                                                                                                                                                                                                                       |             | <input type="checkbox"/> 2 days                                              |                              |                             |            |                                 |                      | Job / SDG No.:         |                        |
| 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: |
| NAWC-110217-RW-286                                                                                                                                                                                                               | 11/2/2017   | 08:10                                                                        | G                            | DW                          | 2          | N                               | N                    | Y                      |                        |
| NAWC-110217-FRB-286                                                                                                                                                                                                              | 11/2/2017   | 08:05                                                                        | G                            | DW                          | 2          | N                               | N                    | Y                      | Field Reagent Blank    |
| WGNA-110217-RW-3978                                                                                                                                                                                                              | 11/2/2017   | 08:40                                                                        | G                            | DW                          | 2          | N                               | N                    | Y                      |                        |
| WGNA-110217-FRB-3978                                                                                                                                                                                                             | 11/2/2017   | 08:35                                                                        | G                            | DW                          | 2          | N                               | N                    | Y                      | Field Reagent Blank    |
| NAWC-110217-RW-177-IRR                                                                                                                                                                                                           | 11/2/2017   | 09:10                                                                        | G                            | DW                          | 2          | N                               | N                    | Y                      |                        |
| X NAWC-110217-FRB-177-IRR                                                                                                                                                                                                        | 11/2/2017   | 09:05                                                                        | G                            | DW                          | 2          | N                               | N                    | Y                      | Field Reagent Blank    |
| NAWC-110217-RW-177-SHOP                                                                                                                                                                                                          | 11/2/2017   | 9:20                                                                         | G                            | DW                          | 2          | N                               | N                    | Y                      |                        |
| NAWC-110217-FRB-177-SHOP                                                                                                                                                                                                         | 11/2/2017   | 9:15                                                                         | G                            | DW                          | 2          | N                               | N                    | Y                      | Field Reagent Blank    |
| NAWC-110217-RW-185                                                                                                                                                                                                               | 11/2/2017   | 10:10                                                                        | G                            | DW                          | 2          | N                               | N                    | Y                      |                        |
| NAWC-110217-FRB-185                                                                                                                                                                                                              | 11/2/2017   | 10:05                                                                        | G                            | DW                          | 2          | N                               | N                    | Y                      | Field Reagent Blank    |
| NAWC-110217-RW-355                                                                                                                                                                                                               | 11/2/2017   | 10:40                                                                        | G                            | DW                          | 2          | N                               | N                    | Y                      |                        |
| NAWC-110217-FRB-355                                                                                                                                                                                                              | 11/2/2017   | 10:35                                                                        | G                            | DW                          | 2          | N                               | N                    | Y                      | Field Reagent Blank    |
| NAWC-110217-RW-348                                                                                                                                                                                                               | 11/2/2017   | 11:40                                                                        | G                            | DW                          | 2          | N                               | N                    | Y                      |                        |
| NAWC-110217-FRB-348                                                                                                                                                                                                              | 11/2/2017   | 11:35                                                                        | G                            | DW                          | 2          | N                               | N                    | Y                      | Field Reagent Blank    |
| WGNA-110217-RW-3882                                                                                                                                                                                                              | 11/2/2017   | 15:40                                                                        | G                            | DW                          | 2          | N                               | N                    | Y                      |                        |
| WGNA-110217-FRB-3882                                                                                                                                                                                                             | 11/2/2017   | 15:35                                                                        | G                            | DW                          | 2          | N                               | N                    | Y                      | Field Reagent Blank    |
| *label NAWC-110217-FRB-185-187 AA 11/09/17                                                                                                                                                                                       |             |                                                                              |                              |                             |            |                                 |                      |                        |                        |
| Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other: Trizma                                                                                                                                                    |             |                                                                              |                              |                             |            |                                 |                      |                        |                        |
| Possible Hazard Identification:<br>Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the                                                                                      |             |                                                                              |                              |                             |            |                                 |                      |                        |                        |
| <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison 9 <input type="checkbox"/> Unknown                                      |             |                                                                              |                              |                             |            |                                 |                      |                        |                        |
| Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)<br><input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for Months |             |                                                                              |                              |                             |            |                                 |                      |                        |                        |
| Fed Ex Tracking: 770649711525 (2 Coolers)                                                                                                                                                                                        |             |                                                                              |                              |                             |            |                                 |                      |                        |                        |
| Custody Seal's Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                                                                  |             |                                                                              |                              |                             |            |                                 |                      |                        |                        |
| Custody Seal No.: 3-2 1-A                                                                                                                                                                                                        |             |                                                                              |                              |                             |            |                                 |                      |                        |                        |
| Cooler Temp. (°C): Obs'd: 1-A                                                                                                                                                                                                    |             |                                                                              |                              |                             |            |                                 |                      |                        |                        |
| Therm ID No.: AK-2                                                                                                                                                                                                               |             |                                                                              |                              |                             |            |                                 |                      |                        |                        |
| Relinquished by: <i>[Signature]</i>                                                                                                                                                                                              |             | Company: Tetra Tech                                                          |                              | Date/Time: 11/2/2017 18:00  |            | Received by: <i>[Signature]</i> |                      | Company: Taus          |                        |
| Relinquished by:                                                                                                                                                                                                                 |             | Company:                                                                     |                              | Date/Time:                  |            | Received by:                    |                      | Company:               |                        |
| Relinquished by:                                                                                                                                                                                                                 |             | Company:                                                                     |                              | Date/Time:                  |            | Received in Laboratory by:      |                      | Company:               |                        |



320-33018 Chain of Custody

S:\WillowGrove PFOs Private Well\COCs TT\COC 20171102

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



**Job Narrative**  
**320-33018-1**

**Receipt**

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

**Receipt Exceptions**

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

**LCMS**

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

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

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

**Organic Prep**

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

# Method Summary

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

TestAmerica Job ID: 320-33018-1

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

**Protocol References:**  
EPA = US Environmental Protection Agency

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

## Sample Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-33018-1

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

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

FORM II  
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-33018-1

SDG No.: \_\_\_\_\_

Matrix: Water

Level: Low

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

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

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.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2017.11.13\_537A\_008.d  
 Lab ID: LCS 320-193512/2-A Client ID: \_\_\_\_\_

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

# Column to be used to flag recovery and RPD values

FORM III  
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2017.11.13\_537A\_009.d  
 Lab ID: LCSD 320-193512/3-A Client ID: \_\_\_\_\_

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

# Column to be used to flag recovery and RPD values

FORM IV  
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Lab File ID: 2017.11.13\_537A\_007.d Lab Sample ID: MB 320-193512/1-A  
 Matrix: Water Date Extracted: 11/08/2017 11:47  
 Instrument ID: A8\_N Date Analyzed: 11/13/2017 02:51  
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: MB 320-193512/1-A  
 Matrix: Water Lab File ID: 2017.11.13\_537A\_007.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 11/08/2017 11:47  
 Sample wt/vol: 250.00 (mL) Date Analyzed: 11/13/2017 02:51  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 194241 Units: ng/L

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

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 85   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 91   |   | 70-130 |



FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A8\_N Calibration Start Date: 11/03/2017 13:37  
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 11/03/2017 14:01  
 Calibration ID: 36012

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

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 50%-150% of internal standard area  
 RT Limit =  $\pm$  0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-194241/2 Date Analyzed: 11/13/2017 02:41  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.11.13\_537A\_005 Heated Purge: (Y/N) N  
 Calibration ID: 36012

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

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

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

RT Limit =  $\pm$  0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-194241/14 Date Analyzed: 11/13/2017 03:38  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.11.13\_537A\_017 Heated Purge: (Y/N) N  
 Calibration ID: 36012

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

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

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

RT Limit =  $\pm$  0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-194251/14 Date Analyzed: 11/13/2017 03:38  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.11.13\_537A\_017 Heated Purge: (Y/N) N  
 Calibration ID: 36012

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

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

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

RT Limit =  $\pm$  0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-194251/25 Date Analyzed: 11/13/2017 04:29  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.11.13\_537A\_028 Heated Purge: (Y/N) N  
 Calibration ID: 36012

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

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

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

RT Limit =  $\pm$  0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

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

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1 Analy Batch No.: 192908

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

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

Calibration Files:

| LEVEL:  | LAB SAMPLE ID:  | LAB FILE ID:              |
|---------|-----------------|---------------------------|
| Level 1 | IC 320-192908/4 | 2017.11.03_537XICAL_004.d |
| Level 2 | IC 320-192908/5 | 2017.11.03_537XICAL_005.d |
| Level 3 | IC 320-192908/6 | 2017.11.03_537XICAL_006.d |
| Level 4 | IC 320-192908/7 | 2017.11.03_537XICAL_007.d |
| Level 5 | IC 320-192908/8 | 2017.11.03_537XICAL_008.d |
| Level 6 | IC 320-192908/9 | 2017.11.03_537XICAL_009.d |

| ANALYTE                              | RRF              |        |        |        |        | CURVE<br>TYPE | COEFFICIENT |        |           | # | MIN RRF | %RSD | # | MAX<br>%RSD | R^2<br>OR COD | # | MIN R^2<br>OR COD |
|--------------------------------------|------------------|--------|--------|--------|--------|---------------|-------------|--------|-----------|---|---------|------|---|-------------|---------------|---|-------------------|
|                                      | LVL 1<br>LVL 6   | LVL 2  | LVL 3  | LVL 4  | LVL 5  |               | B           | M1     | M2        |   |         |      |   |             |               |   |                   |
| Perfluorobutanesulfonic acid (PFBS)  | 1.0397<br>0.8468 | 1.0767 | 1.0898 | 0.9577 | 0.9303 | QuaF          |             | 1.1193 | -0.001498 |   |         |      |   |             | 0.9990        |   | 0.9600            |
| Perfluoroheptanoic acid (PFHpA)      | 0.9433<br>0.9848 | 0.9187 | 0.9551 | 0.9185 | 0.9011 | Ave           |             | 0.9369 |           |   |         | 3.2  |   | 30.0        |               |   |                   |
| Perfluorohexanesulfonic acid (PFHxS) | 1.6459<br>1.6841 | 1.6355 | 1.7405 | 1.6631 | 1.6755 | Ave           |             | 1.6741 |           |   |         | 2.2  |   | 30.0        |               |   |                   |
| Perfluorooctanoic acid (PFOA)        | 0.9757<br>0.9799 | 0.8919 | 0.9000 | 0.8953 | 0.9117 | Ave           |             | 0.9258 |           |   |         | 4.4  |   | 30.0        |               |   |                   |
| Perfluorooctanesulfonic acid (PFOS)  | 0.8958<br>0.9902 | 0.9213 | 0.9281 | 0.9268 | 0.9715 | Ave           |             | 0.9389 |           |   |         | 3.7  |   | 30.0        |               |   |                   |
| Perfluorononanoic acid (PFNA)        | 0.6610<br>0.7042 | 0.6285 | 0.6624 | 0.6810 | 0.6478 | Ave           |             | 0.6642 |           |   |         | 3.9  |   | 30.0        |               |   |                   |
| 13C2 PFHxA                           | 1.0891<br>1.1664 | 1.0526 | 1.1042 | 1.1123 | 1.0772 | Ave           |             | 1.1003 |           |   |         | 3.5  |   | 30.0        |               |   |                   |
| 13C2 PFDA                            | 0.7748<br>0.8159 | 0.7295 | 0.7569 | 0.7811 | 0.7330 | Ave           |             | 0.7652 |           |   |         | 4.3  |   | 30.0        |               |   |                   |

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI  
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA  
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1 Analy Batch No.: 192908

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

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

Calibration Files:

|         |                 |                           |
|---------|-----------------|---------------------------|
| LEVEL:  | LAB SAMPLE ID:  | LAB FILE ID:              |
| Level 1 | IC 320-192908/4 | 2017.11.03_537XICAL_004.d |
| Level 2 | IC 320-192908/5 | 2017.11.03_537XICAL_005.d |
| Level 3 | IC 320-192908/6 | 2017.11.03_537XICAL_006.d |
| Level 4 | IC 320-192908/7 | 2017.11.03_537XICAL_007.d |
| Level 5 | IC 320-192908/8 | 2017.11.03_537XICAL_008.d |
| Level 6 | IC 320-192908/9 | 2017.11.03_537XICAL_009.d |

| ANALYTE                                 | IS<br>REF  | CURVE<br>TYPE | RESPONSE            |         |         |          |          | CONCENTRATION (NG/ML) |       |       |       |       |
|-----------------------------------------|------------|---------------|---------------------|---------|---------|----------|----------|-----------------------|-------|-------|-------|-------|
|                                         |            |               | LVL 1<br>LVL 6      | LVL 2   | LVL 3   | LVL 4    | LVL 5    | LVL 1<br>LVL 6        | LVL 2 | LVL 3 | LVL 4 | LVL 5 |
| Perfluorobutanesulfonic acid (PFBS)     | PFOS       | QuaF          | 1076553<br>16699152 | 2591121 | 5461974 | 10142530 | 14011858 | 9.00<br>180           | 20.0  | 45.0  | 90.0  | 135   |
| Perfluoroheptanoic acid (PFHpA)         | 13PF<br>OA | Ave           | 143455<br>2810797   | 331548  | 736034  | 1420703  | 2102676  | 1.00<br>20.0          | 2.22  | 5.00  | 10.0  | 15.0  |
| Perfluorohexanesulfonic acid<br>(PFHxS) | PFOS       | Ave           | 568156<br>11071993  | 1312135 | 2908204 | 5871843  | 8413133  | 3.00<br>60.0          | 6.67  | 15.0  | 30.0  | 45.0  |
| Perfluorooctanoic acid (PFOA)           | 13PF<br>OA | Ave           | 296934<br>5597122   | 644149  | 1388033 | 2771271  | 4257225  | 2.00<br>40.0          | 4.45  | 10.0  | 20.0  | 30.0  |
| Perfluorooctanesulfonic acid (PFOS)     | PFOS       | Ave           | 412315<br>8679676   | 985487  | 2067792 | 4363079  | 6504279  | 4.00<br>80.0          | 8.89  | 20.0  | 40.0  | 60.0  |
| Perfluorononanoic acid (PFNA)           | 13PF<br>OA | Ave           | 201053<br>4019666   | 453612  | 1020851 | 2106479  | 3023088  | 2.00<br>40.0          | 4.45  | 10.0  | 20.0  | 30.0  |
| 13C2 PFHxA                              | 13PF<br>OA | Ave           | 1655691<br>1664260  | 1708988 | 1701491 | 1719911  | 1675220  | 10.0<br>10.0          | 10.0  | 10.0  | 10.0  | 10.0  |
| 13C2 PFDA                               | 13PF<br>OA | Ave           | 1177922<br>1164156  | 1184358 | 1166275 | 1207887  | 1139992  | 10.0<br>10.0          | 10.0  | 10.0  | 10.0  | 10.0  |

Curve Type Legend:

|                                   |
|-----------------------------------|
| Ave = Average ISTD                |
| QuaF = Quadratic ISTD forced zero |

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

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1 Analy Batch No.: 192908

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

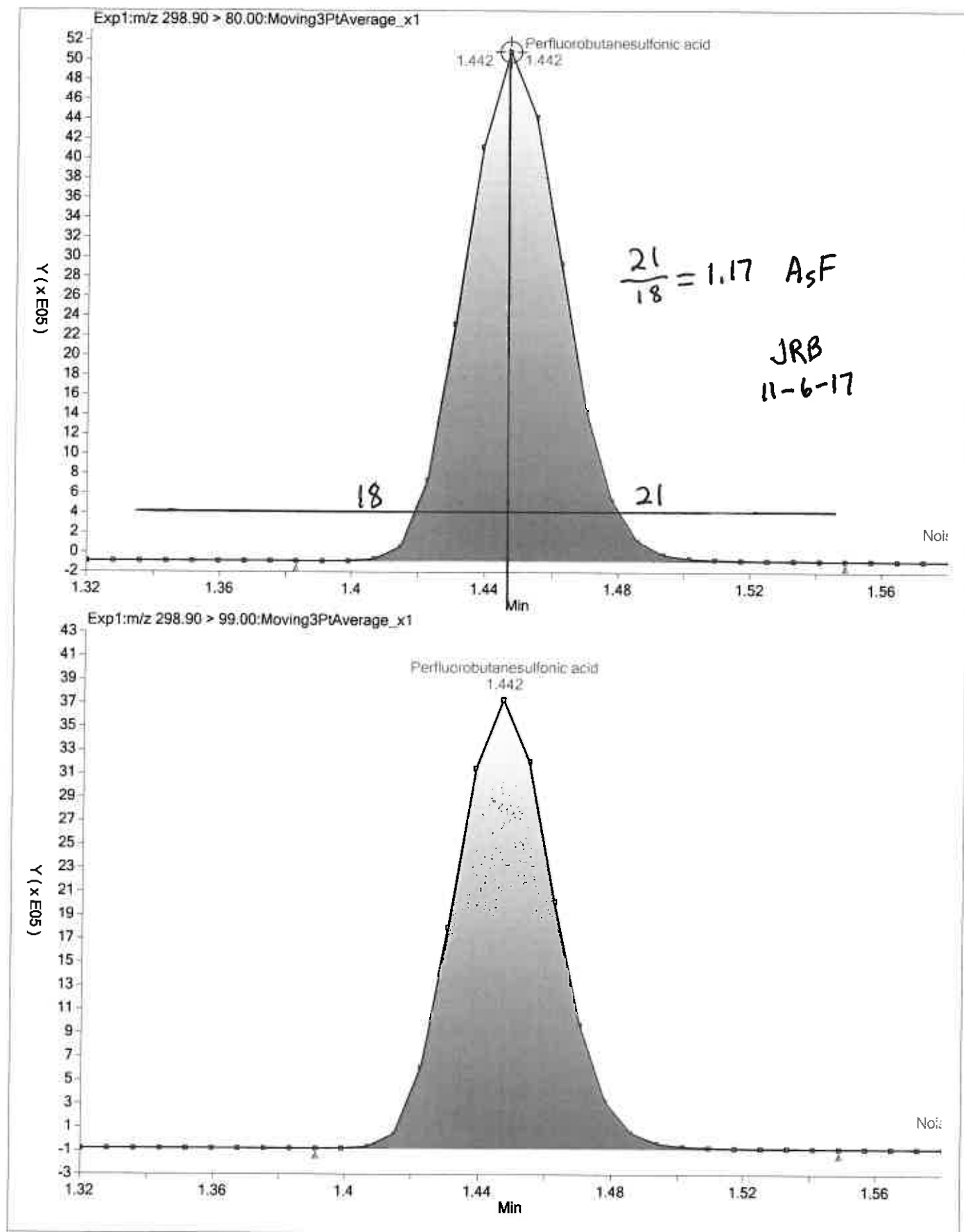
Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

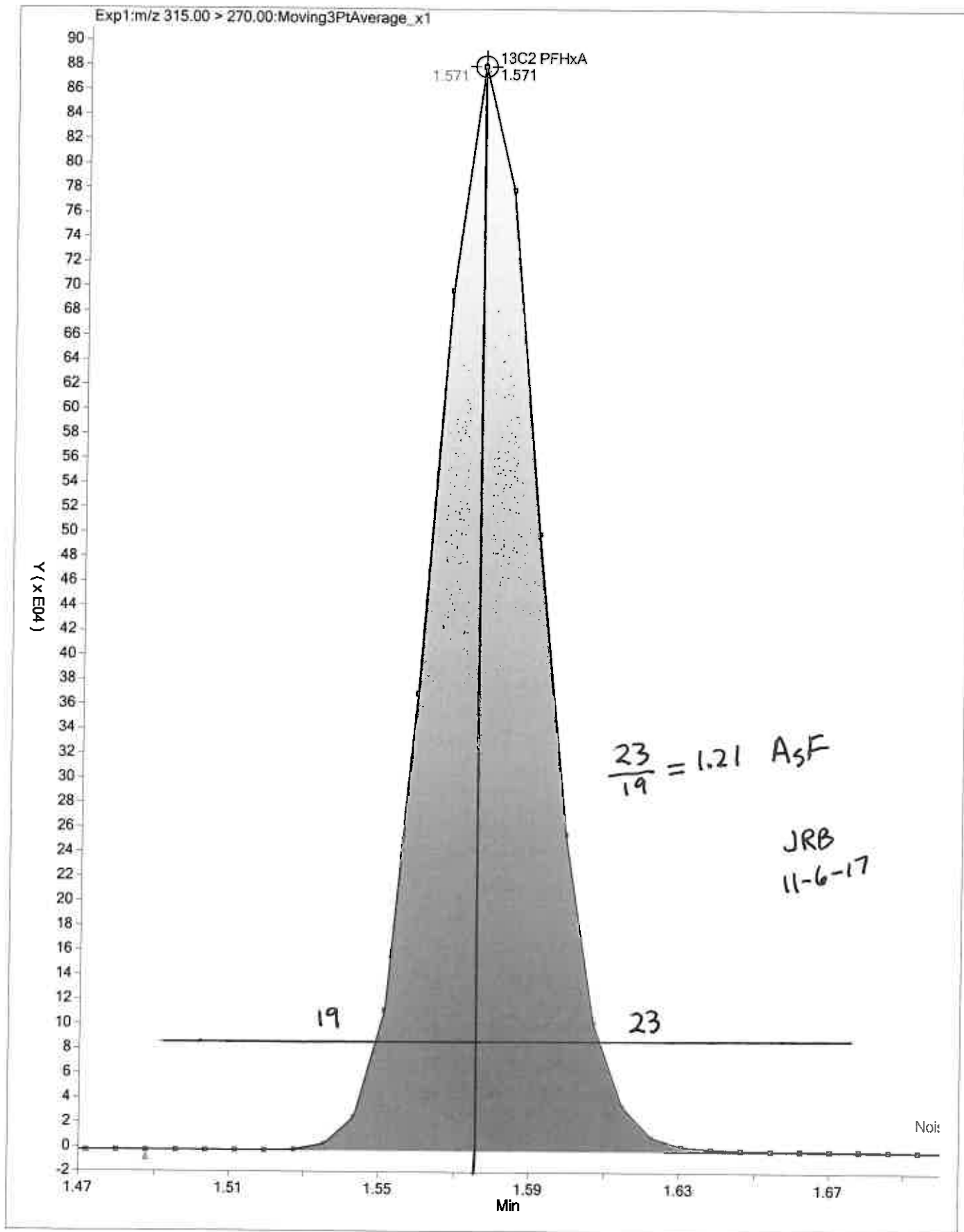
Calibration Files:

| LEVEL:  | LAB SAMPLE ID:  | LAB FILE ID:              |
|---------|-----------------|---------------------------|
| Level 1 | IC 320-192908/4 | 2017.11.03_537XICAL_004.d |
| Level 2 | IC 320-192908/5 | 2017.11.03_537XICAL_005.d |
| Level 3 | IC 320-192908/6 | 2017.11.03_537XICAL_006.d |
| Level 4 | IC 320-192908/7 | 2017.11.03_537XICAL_007.d |
| Level 5 | IC 320-192908/8 | 2017.11.03_537XICAL_008.d |
| Level 6 | IC 320-192908/9 | 2017.11.03_537XICAL_009.d |

| ANALYTE                              | PERCENT ERROR |         |         |         |         |         | PERCENT ERROR LIMIT |       |       |       |       |       |
|--------------------------------------|---------------|---------|---------|---------|---------|---------|---------------------|-------|-------|-------|-------|-------|
|                                      | LVL 1 #       | LVL 2 # | LVL 3 # | LVL 4 # | LVL 5 # | LVL 6 # | LVL 1               | LVL 2 | LVL 3 | LVL 4 | LVL 5 | LVL 6 |
| Perfluorobutanesulfonic acid (PFBS)  | -6.0          | -1.2    | 3.9     | -3.1    | 1.9     | -0.5    | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluoroheptanoic acid (PFHpA)      | 0.7           | -1.9    | 1.9     | -2.0    | -3.8    | 5.1     | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluorohexanesulfonic acid (PFHxS) | -1.7          | -2.3    | 4.0     | -0.7    | 0.1     | 0.6     | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluorooctanoic acid (PFOA)        | 5.4           | -3.7    | -2.8    | -3.3    | -1.5    | 5.8     | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluorooctanesulfonic acid (PFOS)  | -4.6          | -1.9    | -1.2    | -1.3    | 3.5     | 5.5     | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluorononanoic acid (PFNA)        | -0.5          | -5.4    | -0.3    | 2.5     | -2.5    | 6.0     | 50                  | 30    | 30    | 30    | 30    | 30    |
| 13C2 PFHxA                           | -1.0          | -4.3    | 0.4     | 1.1     | -2.1    | 6.0     | 30                  | 30    | 30    | 30    | 30    | 30    |
| 13C2 PFDA                            | 1.3           | -4.7    | -1.1    | 2.1     | -4.2    | 6.6     | 30                  | 30    | 30    | 30    | 30    | 30    |







FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-192908/11 Calibration Date: 11/03/2017 14:10  
 Instrument ID: A8\_N Calib Start Date: 11/03/2017 13:37  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01  
 Lab File ID: 2017.11.03\_537XICAL\_011.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | QuaF          |         | 1.109  |         | 20.4           | 20.0            | 1.9  | 50.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 0.9369  | 0.9382 |         | 2.23           | 2.22            | 0.1  | 50.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.674   | 1.688  |         | 6.72           | 6.67            | 0.8  | 50.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 0.9258  | 0.8825 |         | 4.24           | 4.45            | -4.7 | 50.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 0.9389  | 0.9176 |         | 8.69           | 8.89            | -2.3 | 50.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.6642  | 0.6625 |         | 4.43           | 4.45            | -0.2 | 50.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.068  |         | 9.70           | 10.0            | -3.0 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.7652  | 0.7460 |         | 9.75           | 10.0            | -2.5 | 30.0      |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: ICV 320-192908/13 Calibration Date: 11/03/2017 14:20  
 Instrument ID: A8\_N Calib Start Date: 11/03/2017 13:37  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01  
 Lab File ID: 2017.11.03\_537XICAL\_013.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D    | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|-------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | QuaF          |         | 0.8310 |         | 83.7           | 100             | -16.4 | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 0.9369  | 0.8136 |         | 8.68           | 10.0            | -13.2 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.674   | 1.463  |         | 17.5           | 20.1            | -12.6 | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 0.9258  | 0.7995 |         | 17.7           | 20.5            | -13.6 | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 0.9389  | 0.8637 |         | 18.1           | 19.7            | -8.0  | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.6642  | 0.6428 |         | 19.5           | 20.1            | -3.2  | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.039  |         | 9.44           | 10.0            | -5.6  | 30.0      |
| 13C2 PFDA                               | Ave           | 0.7652  | 0.7391 |         | 9.66           | 10.0            | -3.4  | 30.0      |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-194241/1 Calibration Date: 11/13/2017 02:37  
 Instrument ID: A8\_N Calib Start Date: 11/03/2017 13:37  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01  
 Lab File ID: 2017.11.13\_537A\_004.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | QuaF          |         | 1.127  |         | 20.7           | 20.0            | 3.5  | 50.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 0.9369  | 0.9071 |         | 2.15           | 2.22            | -3.2 | 50.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.674   | 1.664  |         | 6.63           | 6.67            | -0.6 | 50.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 0.9258  | 0.9135 |         | 4.39           | 4.45            | -1.3 | 50.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 0.9389  | 0.9202 |         | 8.71           | 8.89            | -2.0 | 50.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.6642  | 0.6934 |         | 4.64           | 4.45            | 4.4  | 50.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.120  |         | 10.2           | 10.0            | 1.8  | 30.0      |
| 13C2 PFDA                               | Ave           | 0.7652  | 0.7392 |         | 9.66           | 10.0            | -3.4 | 30.0      |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-194241/2 Calibration Date: 11/13/2017 02:41  
 Instrument ID: A8\_N Calib Start Date: 11/03/2017 13:37  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01  
 Lab File ID: 2017.11.13\_537A\_005.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | QuaF          |         | 1.145  |         | 49.3           | 45.0            | 9.5  | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 0.9369  | 0.9151 |         | 4.88           | 5.00            | -2.3 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.674   | 1.751  |         | 15.7           | 15.0            | 4.6  | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 0.9258  | 0.9280 |         | 10.0           | 10.0            | 0.2  | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 0.9389  | 0.9620 |         | 20.5           | 20.0            | 2.5  | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.6642  | 0.6857 |         | 10.3           | 10.0            | 3.2  | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.080  |         | 9.82           | 10.0            | -1.8 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.7652  | 0.7611 |         | 9.95           | 10.0            | -0.5 | 30.0      |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-194241/14 Calibration Date: 11/13/2017 03:38  
 Instrument ID: A8\_N Calib Start Date: 11/03/2017 13:37  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01  
 Lab File ID: 2017.11.13\_537A\_017.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | QuaF          |         | 0.9190 |         | 135            | 135             | 0.3  | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 0.9369  | 0.9320 |         | 14.9           | 15.0            | -0.5 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.674   | 1.682  |         | 45.2           | 45.0            | 0.5  | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 0.9258  | 0.9706 |         | 31.5           | 30.0            | 4.8  | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 0.9389  | 0.9543 |         | 61.0           | 60.0            | 1.6  | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.6642  | 0.6855 |         | 31.0           | 30.0            | 3.2  | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.089  |         | 9.90           | 10.0            | -1.0 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.7652  | 0.7607 |         | 9.94           | 10.0            | -0.6 | 30.0      |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-194251/14 Calibration Date: 11/13/2017 03:38  
 Instrument ID: A8\_N Calib Start Date: 11/03/2017 13:37  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01  
 Lab File ID: 2017.11.13\_537A\_017.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | QuaF          |         | 0.9190 |         | 135            | 135             | 0.3  | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 0.9369  | 0.9320 |         | 14.9           | 15.0            | -0.5 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.674   | 1.682  |         | 45.2           | 45.0            | 0.5  | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 0.9258  | 0.9706 |         | 31.5           | 30.0            | 4.8  | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 0.9389  | 0.9543 |         | 61.0           | 60.0            | 1.6  | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.6642  | 0.6855 |         | 31.0           | 30.0            | 3.2  | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.089  |         | 9.90           | 10.0            | -1.0 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.7652  | 0.7607 |         | 9.94           | 10.0            | -0.6 | 30.0      |



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33018-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-194251/25 Calibration Date: 11/13/2017 04:29  
 Instrument ID: A8\_N Calib Start Date: 11/03/2017 13:37  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01  
 Lab File ID: 2017.11.13\_537A\_028.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | QuaF          |         | 1.109  |         | 47.6           | 45.0            | 5.8  | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 0.9369  | 0.8978 |         | 4.79           | 5.00            | -4.2 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.674   | 1.698  |         | 15.2           | 15.0            | 1.4  | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 0.9258  | 0.9001 |         | 9.73           | 10.0            | -2.8 | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 0.9389  | 0.9068 |         | 19.3           | 20.0            | -3.4 | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.6642  | 0.6547 |         | 9.86           | 10.0            | -1.4 | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.061  |         | 9.65           | 10.0            | -3.5 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.7652  | 0.7009 |         | 9.16           | 10.0            | -8.4 | 30.0      |

# LCMS ANALYSIS RUN LOG

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

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Start Date: 11/03/2017 13:37

Analysis Batch Number: 192908 End Date: 11/03/2017 14:24

| LAB SAMPLE ID             | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID                   | COLUMN ID             |
|---------------------------|------------------|------------------|--------------------|-------------------------------|-----------------------|
| IC 320-192908/4           |                  | 11/03/2017 13:37 | 1                  | 2017.11.03_537X<br>ICAL 004.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/5           |                  | 11/03/2017 13:42 | 1                  | 2017.11.03_537X<br>ICAL 005.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/6           |                  | 11/03/2017 13:47 | 1                  | 2017.11.03_537X<br>ICAL 006.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/7<br>ICISAV |                  | 11/03/2017 13:52 | 1                  | 2017.11.03_537X<br>ICAL 007.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/8           |                  | 11/03/2017 13:56 | 1                  | 2017.11.03_537X<br>ICAL 008.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/9           |                  | 11/03/2017 14:01 | 1                  | 2017.11.03_537X<br>ICAL 009.d | GeminiC18 3x100 3(mm) |
| ZZZZZ                     |                  | 11/03/2017 14:06 | 1                  |                               | GeminiC18 3x100 3(mm) |
| CCVL 320-192908/11        |                  | 11/03/2017 14:10 | 1                  | 2017.11.03_537X<br>ICAL 011.d | GeminiC18 3x100 3(mm) |
| ZZZZZ                     |                  | 11/03/2017 14:15 | 1                  |                               | GeminiC18 3x100 3(mm) |
| ICV 320-192908/13         |                  | 11/03/2017 14:20 | 1                  | 2017.11.03_537X<br>ICAL 013.d | GeminiC18 3x100 3(mm) |
| ZZZZZ                     |                  | 11/03/2017 14:24 | 1                  |                               | GeminiC18 3x100 3(mm) |

## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-33018-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_NStart Date: 11/13/2017 02:37Analysis Batch Number: 194241End Date: 11/13/2017 03:38

| LAB SAMPLE ID              | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID              | COLUMN ID             |
|----------------------------|------------------|------------------|--------------------|--------------------------|-----------------------|
| CCVL 320-194241/1          |                  | 11/13/2017 02:37 | 1                  | 2017.11.13_537A<br>004.d | GeminiC18 3x100 3(mm) |
| CCV 320-194241/2<br>CCVIS  |                  | 11/13/2017 02:41 | 1                  | 2017.11.13_537A<br>005.d | GeminiC18 3x100 3(mm) |
| ZZZZZ                      |                  | 11/13/2017 02:46 | 1                  |                          | GeminiC18 3x100 3(mm) |
| MB 320-193512/1-A          |                  | 11/13/2017 02:51 | 1                  | 2017.11.13_537A<br>007.d | GeminiC18 3x100 3(mm) |
| LCS 320-193512/2-A         |                  | 11/13/2017 02:55 | 1                  | 2017.11.13_537A<br>008.d | GeminiC18 3x100 3(mm) |
| LCSD 320-193512/3-A        |                  | 11/13/2017 03:00 | 1                  | 2017.11.13_537A<br>009.d | GeminiC18 3x100 3(mm) |
| 320-33018-1                |                  | 11/13/2017 03:05 | 1                  | 2017.11.13_537A<br>010.d | GeminiC18 3x100 3(mm) |
| 320-33018-2                |                  | 11/13/2017 03:09 | 1                  | 2017.11.13_537A<br>011.d | GeminiC18 3x100 3(mm) |
| 320-33018-3                |                  | 11/13/2017 03:14 | 1                  | 2017.11.13_537A<br>012.d | GeminiC18 3x100 3(mm) |
| 320-33018-4                |                  | 11/13/2017 03:19 | 1                  | 2017.11.13_537A<br>013.d | GeminiC18 3x100 3(mm) |
| 320-33018-5                |                  | 11/13/2017 03:24 | 1                  | 2017.11.13_537A<br>014.d | GeminiC18 3x100 3(mm) |
| 320-33018-6                |                  | 11/13/2017 03:28 | 1                  | 2017.11.13_537A<br>015.d | GeminiC18 3x100 3(mm) |
| 320-33018-7                |                  | 11/13/2017 03:33 | 1                  | 2017.11.13_537A<br>016.d | GeminiC18 3x100 3(mm) |
| CCV 320-194241/14<br>CCVIS |                  | 11/13/2017 03:38 | 1                  | 2017.11.13_537A<br>017.d | GeminiC18 3x100 3(mm) |

## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-33018-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_NStart Date: 11/13/2017 03:38Analysis Batch Number: 194251End Date: 11/13/2017 04:29

| LAB SAMPLE ID              | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID              | COLUMN ID             |
|----------------------------|------------------|------------------|--------------------|--------------------------|-----------------------|
| CCV 320-194251/14<br>CCVIS |                  | 11/13/2017 03:38 | 1                  | 2017.11.13_537A<br>017.d | GeminiC18 3x100 3(mm) |
| ZZZZZ                      |                  | 11/13/2017 03:42 | 1                  |                          | GeminiC18 3x100 3(mm) |
| 320-33018-8                |                  | 11/13/2017 03:47 | 1                  | 2017.11.13_537A<br>019.d | GeminiC18 3x100 3(mm) |
| 320-33018-9                |                  | 11/13/2017 03:52 | 1                  | 2017.11.13_537A<br>020.d | GeminiC18 3x100 3(mm) |
| 320-33018-10               |                  | 11/13/2017 03:56 | 1                  | 2017.11.13_537A<br>021.d | GeminiC18 3x100 3(mm) |
| 320-33018-11               |                  | 11/13/2017 04:01 | 1                  | 2017.11.13_537A<br>022.d | GeminiC18 3x100 3(mm) |
| 320-33018-12               |                  | 11/13/2017 04:06 | 1                  | 2017.11.13_537A<br>023.d | GeminiC18 3x100 3(mm) |
| 320-33018-13               |                  | 11/13/2017 04:10 | 1                  | 2017.11.13_537A<br>024.d | GeminiC18 3x100 3(mm) |
| 320-33018-14               |                  | 11/13/2017 04:15 | 1                  | 2017.11.13_537A<br>025.d | GeminiC18 3x100 3(mm) |
| 320-33018-15               |                  | 11/13/2017 04:20 | 1                  | 2017.11.13_537A<br>026.d | GeminiC18 3x100 3(mm) |
| 320-33018-16               |                  | 11/13/2017 04:24 | 1                  | 2017.11.13_537A<br>027.d | GeminiC18 3x100 3(mm) |
| CCV 320-194251/25<br>CCVIS |                  | 11/13/2017 04:29 | 1                  | 2017.11.13_537A<br>028.d | GeminiC18 3x100 3(mm) |

## LCMS BATCH WORKSHEET

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

SDG No.: \_\_\_\_\_

Batch Number: 193512 Batch Start Date: 11/08/17 11:47 Batch Analyst: Kolstad, Kate MBatch Method: 537 Batch End Date: 11/10/17 21:40

| Lab Sample ID     | Client Sample ID         | Method Chain | Basis | GrossWeight | TareWeight | InitialAmount | FinalAmount | ReceivedpH | LC537-HSP 00023 |
|-------------------|--------------------------|--------------|-------|-------------|------------|---------------|-------------|------------|-----------------|
| MB 320-193512/1   |                          | 537, 537     |       |             |            | 250.00 mL     | 1.00 mL     | 7 SU       |                 |
| LCS 320-193512/2  |                          | 537, 537     |       |             |            | 250.00 mL     | 1.00 mL     | 7 SU       | 100 uL          |
| LCSD 320-193512/3 |                          | 537, 537     |       |             |            | 250.00 mL     | 1.00 mL     | 7 SU       | 100 uL          |
| 320-33018-A-1     | NAWC-110217-RW-286       | 537, 537     | T     | 270.43 g    | 28.11 g    | 242.3 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-2     | NAWC-110217-FRB-286      | 537, 537     | T     | 271.04 g    | 27.17 g    | 243.9 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-3     | WGNA-110217-RW-3978      | 537, 537     | T     | 273.22 g    | 27.56 g    | 245.7 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-4     | WGNA-110217-FRB-3978     | 537, 537     | T     | 274.53 g    | 27.09 g    | 247.4 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-5     | NAWC-110217-RW-177-IRR   | 537, 537     | T     | 270.84 g    | 27.71 g    | 243.1 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-6     | NAWC-110217-FRB-177-IRR  | 537, 537     | T     | 273.38 g    | 27.11 g    | 246.3 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-7     | NAWC-110217-RW-177-SHOP  | 537, 537     | T     | 271.42 g    | 27.64 g    | 243.8 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-8     | NAWC-110217-FRB-177-SHOP | 537, 537     | T     | 278.25 g    | 27.13 g    | 251.1 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-9     | NAWC-110217-RW-185       | 537, 537     | T     | 276.72 g    | 27.58 g    | 249.1 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-10    | NAWC-110217-FRB-185      | 537, 537     | T     | 278.08 g    | 27.51 g    | 250.6 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-11    | NAWC-110217-RW-355       | 537, 537     | T     | 277.12 g    | 27.81 g    | 249.3 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-12    | NAWC-110217-FRB-355      | 537, 537     | T     | 272.81 g    | 27.63 g    | 245.2 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-13    | NAWC-110217-RW-348       | 537, 537     | T     | 278.13 g    | 27.83 g    | 250.3 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-14    | NAWC-110217-FRB-348      | 537, 537     | T     | 279.53 g    | 27.08 g    | 252.5 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-15    | WGNA-110217-RW-3882      | 537, 537     | T     | 278.85 g    | 27.95 g    | 250.9 mL      | 1.00 mL     | 7 SU       |                 |
| 320-33018-A-16    | WGNA-110217-FRB-3882     | 537, 537     | T     | 275.73 g    | 27.85 g    | 247.9 mL      | 1.00 mL     | 7 SU       |                 |

| Lab Sample ID   | Client Sample ID | Method Chain | Basis | LC537-IS 00050 | LC537-SU 00051 | AnalysisComment |  |  |  |
|-----------------|------------------|--------------|-------|----------------|----------------|-----------------|--|--|--|
| MB 320-193512/1 |                  | 537, 537     |       | 100 uL         | 100 uL         | Cl ND           |  |  |  |

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

## LCMS BATCH WORKSHEET

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

SDG No.: \_\_\_\_\_

Batch Number: 193512 Batch Start Date: 11/08/17 11:47 Batch Analyst: Kolstad, Kate MBatch Method: 537 Batch End Date: 11/10/17 21:40

| Lab Sample ID        | Client Sample ID             | Method Chain | Basis | LC537-IS 00050 | LC537-SU 00051 | AnalysisComment |  |  |  |
|----------------------|------------------------------|--------------|-------|----------------|----------------|-----------------|--|--|--|
| LCS<br>320-193512/2  |                              | 537, 537     |       | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| LCSD<br>320-193512/3 |                              | 537, 537     |       | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-1        | NAWC-110217-RW-2<br>86       | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-2        | NAWC-110217-FRB-<br>286      | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-3        | WGNA-110217-RW-3<br>978      | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-4        | WGNA-110217-FRB-<br>3978     | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-5        | NAWC-110217-RW-1<br>77-IRR   | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-6        | NAWC-110217-FRB-<br>177-IRR  | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-7        | NAWC-110217-RW-1<br>77-SHOP  | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-8        | NAWC-110217-FRB-<br>177-SHOP | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-9        | NAWC-110217-RW-1<br>85       | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-10       | NAWC-110217-FRB-<br>185      | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-11       | NAWC-110217-RW-3<br>55       | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-12       | NAWC-110217-FRB-<br>355      | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-13       | NAWC-110217-RW-3<br>48       | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-14       | NAWC-110217-FRB-<br>348      | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-15       | WGNA-110217-RW-3<br>882      | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |
| 320-33018-A-16       | WGNA-110217-FRB-<br>3882     | 537, 537     | T     | 100 uL         | 100 uL         | C1 ND           |  |  |  |

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

## LCMS BATCH WORKSHEET

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

SDG No.: \_\_\_\_\_

Batch Number: 193512 Batch Start Date: 11/08/17 11:47 Batch Analyst: Kolstad, Kate MBatch Method: 537 Batch End Date: 11/10/17 21:40

| Batch Notes                          |            |
|--------------------------------------|------------|
| Analyst ID - Aliquot Step            | TWL        |
| Analyst ID - Concentration           | NIGHTS/CCB |
| Analyst ID - Final Volume Step       | CCB        |
| Internal Standard ID#                | 1041858    |
| Manifold ID                          | 3, 4       |
| Methanol ID                          | 1076416    |
| Pipette ID                           | M16387D    |
| Analyst ID - IS Reagent Drop         | CCB        |
| Analyst ID - IS Reagent Drop Witness | JNS        |
| Analyst ID - SU Reagent Drop         | VPM        |
| Analyst ID - SU Reagent Drop Witness | KMK        |
| Analyst ID - TA Reagent Drop         | VPM        |
| Analyst ID - TA Reagent Drop Witness | KMK        |
| SPE Cartridge ID                     | 6357081-09 |
| Trizma ID                            | SLBR4303V  |
| Reagent Water ID                     | 11-2-17    |

| Basis | Basis Description |
|-------|-------------------|
| T     | Total/NA          |

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

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512

Analyst: Kolstad, Kate M

Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537\_Prep-320

Batch End: 11/10/2017 9:40:00PM

79 AB 4/12/17  
A8 11/15/17

## Extraction of Perfluorinated Alkyl Acids

| Input Sample Lab ID<br>(Analytical Method) | SDG<br>(Job #)       | GrossWt<br>TareWt | InitAmnt<br>FinAmnt | Rcvd | PHs<br>Adj1 | Adj2 | Due Date | Analytical<br>TAT | Div<br>Rank | Comments | Output Sample Lab ID                                                                  |
|--------------------------------------------|----------------------|-------------------|---------------------|------|-------------|------|----------|-------------------|-------------|----------|---------------------------------------------------------------------------------------|
| 1 MB-320-193512/1<br>N/A                   | N/A                  |                   | 250.00 mL           | 7    |             |      | N/A      | N/A               | N/A         | CI ND    |    |
|                                            |                      |                   | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 2 LCS-320-193512/2<br>N/A                  | N/A                  |                   | 250.00 mL           | 7    |             |      | N/A      | N/A               | N/A         | CI ND    |    |
|                                            |                      |                   | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 3 LCSD-320-193512/3<br>N/A                 | N/A                  |                   | 250.00 mL           | 7    |             |      | N/A      | N/A               | N/A         | CI ND    |    |
|                                            |                      |                   | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 320-33018-A-1<br>(537_DOD5)                | N/A<br>(320-33018-1) | 270.43 g          | 242.3 mL            | 7    |             |      | 11/7/17  | 16_Days           | 4           | CI ND    |    |
|                                            |                      | 28.11 g           | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 320-33018-A-2<br>(537_DOD5)                | N/A<br>(320-33018-1) | 271.04 g          | 243.9 mL            | 7    |             |      | 11/7/17  | 16_Days           | 4           | CI ND    |    |
|                                            |                      | 27.17 g           | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 320-33018-A-3<br>(537_DOD5)                | N/A<br>(320-33018-1) | 273.22 g          | 245.7 mL            | 7    |             |      | 11/7/17  | 16_Days           | 4           | CI ND    |   |
|                                            |                      | 27.56 g           | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 320-33018-A-4<br>(537_DOD5)                | N/A<br>(320-33018-1) | 274.53 g          | 247.4 mL            | 7    |             |      | 11/7/17  | 16_Days           | 4           | CI ND    |  |
|                                            |                      | 27.09 g           | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 320-33018-A-5<br>(537_DOD5)                | N/A<br>(320-33018-1) | 270.84 g          | 243.1 mL            | 7    |             |      | 11/7/17  | 16_Days           | 4           | CI ND    |  |
|                                            |                      | 27.71 g           | 1.00 mL             |      |             |      |          |                   |             | RI       |                                                                                       |
| 320-33018-A-6<br>(537_DOD5)                | N/A<br>(320-33018-1) | 273.38 g          | 246.3 mL            | 7    |             |      | 11/7/17  | 16_Days           | 4           | CI ND    |  |
|                                            |                      | 27.11 g           | 1.00 mL             |      |             |      |          |                   |             |          |                                                                                       |
| 320-33018-A-7<br>(537_DOD5)                | N/A<br>(320-33018-1) | 271.42 g          | 243.8 mL            | 7    |             |      | 11/7/17  | 16_Days           | 4           | CI ND    |  |
|                                            |                      | 27.64 g           | 1.00 mL             |      |             |      |          |                   |             | RI       |                                                                                       |



# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512

Analyst: Kolstad, Kate M

Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537\_Prep-320

Batch End: 11/10/2017 9:40:00PM

|    |                              |                      |                     |                     |   |  |         |         |   |       |                                                                                       |
|----|------------------------------|----------------------|---------------------|---------------------|---|--|---------|---------|---|-------|---------------------------------------------------------------------------------------|
| 11 | 320-33018-A-8<br>(537_DOD5)  | N/A<br>(320-33018-1) | 278.25 g<br>27.13 g | 251.1 mL<br>1.00 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |    |
| 12 | 320-33018-A-9<br>(537_DOD5)  | N/A<br>(320-33018-1) | 276.72 g<br>27.58 g | 249.1 mL<br>1.00 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |    |
| 13 | 320-33018-A-10<br>(537_DOD5) | N/A<br>(320-33018-1) | 278.08 g<br>27.51 g | 250.6 mL<br>1.00 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |    |
| 14 | 320-33018-A-11<br>(537_DOD5) | N/A<br>(320-33018-1) | 277.12 g<br>27.81 g | 249.3 mL<br>1.00 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |    |
| 15 | 320-33018-A-12<br>(537_DOD5) | N/A<br>(320-33018-1) | 272.81 g<br>27.63 g | 245.2 mL<br>1.00 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |    |
| 16 | 320-33018-A-13<br>(537_DOD5) | N/A<br>(320-33018-1) | 278.13 g<br>27.83 g | 250.3 mL<br>1.00 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |    |
| 17 | 320-33018-A-14<br>(537_DOD5) | N/A<br>(320-33018-1) | 279.53 g<br>27.08 g | 252.5 mL<br>1.00 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |    |
| 18 | 320-33018-A-15<br>(537_DOD5) | N/A<br>(320-33018-1) | 278.85 g<br>27.95 g | 250.9 mL<br>1.00 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |    |
| 19 | 320-33018-A-16<br>(537_DOD5) | N/A<br>(320-33018-1) | 275.73 g<br>27.85 g | 247.9 mL<br>1.00 mL | 7 |  | 11/7/17 | 16_Days | 4 | CI ND |  |

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512

Analyst: Kolstad, Kate M

Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537\_Prep-320

Batch End: 11/10/2017 9:40:00PM

## Batch Notes

Manifold ID 3, 4

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-09

Methanol ID 1076416

Reagent Water ID 11-2-17

Internal Standard ID# 1041858

Pipette ID M16387D

Analyst ID - TA Reagent Drop VPM

Analyst ID - TA Reagent Drop KMK  
Witness

Analyst ID - SU Reagent Drop VPM

Analyst ID - SU Reagent Drop KMK  
Witness

Analyst ID - IS Reagent Drop CCB

Analyst ID - IS Reagent Drop JNS  
Witness

Analyst ID - Concentration NIGHTS/CCB

Analyst ID - Aliquot Step TWL

Analyst ID - Final Volume Step CCB

Batch Comment NA

## Comments

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512

Analyst: Kolstad, Kate M

Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537\_Prep-320

Batch End:

## Reagent Additions Worksheet

| Lab ID            | Reagent Code    | Amount Added | Final Amount | By           | Witness     |
|-------------------|-----------------|--------------|--------------|--------------|-------------|
| MB 320-193512/1   | LC537-SU_00051  | 100 uL       | 1.00 mL      | vpmm 11/8/17 | kmk 11-8-17 |
| LCS 320-193512/2  | LC537-HSP_00023 | 100 uL       | 1.00 mL      |              |             |
| LCS 320-193512/2  | LC537-SU_00051  | 100 uL       | 1.00 mL      |              |             |
| LCSD 320-193512/3 | LC537-HSP_00023 | 100 uL       | 1.00 mL      |              |             |
| LCSD 320-193512/3 | LC537-SU_00051  | 100 uL       | 1.00 mL      |              |             |
| 320-33018-A-1     | LC537-SU_00051  | 100 uL       | 1.00 mL      |              |             |
| 320-33018-A-2     | LC537-SU_00051  | 100 uL       | 1.00 mL      |              |             |
| 320-33018-A-3     | LC537-SU_00051  | 100 uL       | 1.00 mL      |              |             |
| 320-33018-A-4     | LC537-SU_00051  | 100 uL       | 1.00 mL      |              |             |
| 320-33018-A-5     | LC537-SU_00051  | 100 uL       | 1.00 mL      |              |             |
| 320-33018-A-6     | LC537-SU_00051  | 100 uL       | 1.00 mL      |              |             |
| 320-33018-A-7     | LC537-SU_00051  | 100 uL       | 1.00 mL      |              |             |
| 320-33018-A-8     | LC537-SU_00051  | 100 uL       | 1.00 mL      |              |             |
| 320-33018-A-9     | LC537-SU_00051  | 100 uL       | 1.00 mL      |              |             |
| 320-33018-A-10    | LC537-SU_00051  | 100 uL       | 1.00 mL      |              |             |
| 320-33018-A-11    | LC537-SU_00051  | 100 uL       | 1.00 mL      |              |             |
| 320-33018-A-12    | LC537-SU_00051  | 100 uL       | 1.00 mL      |              |             |
| 320-33018-A-13    | LC537-SU_00051  | 100 uL       | 1.00 mL      |              |             |

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# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-193512

Analyst: Kolstad, Kate M

Batch Open: 11/8/2017 11:47:00AM

Method Code: 320-537\_Prep-320

Batch End:

|                |                |        |         |             |             |
|----------------|----------------|--------|---------|-------------|-------------|
| 320-33018-A-14 | LC537-SU_00051 | 100 uL | 1.00 mL | VPM 11/8/17 | KMK 11-8-17 |
| 320-33018-A-15 | LC537-SU_00051 | 100 uL | 1.00 mL | ↓           | ↓           |
| 320-33018-A-16 | LC537-SU_00051 | 100 uL | 1.00 mL | ↓           | ↓           |

## Other Reagents:

Reagent

Amount/Units

Lot#:

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PFAS Calibration Calculations:

Initial Calibration 11/3/2017  
Instrument A8\_N

Perfluorohexanesulfonic acid

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

Continuing Calibration 11/13/2017 @ 2:37  
A8\_N

Perfluorohexanesulfonic acid

| Analyte<br>Concentration | Analyte<br>Response | Internal Standard<br>Response | Internal Standard<br>Amount | RRF    | %D        | Reported<br>RRF | Reported<br>%D |
|--------------------------|---------------------|-------------------------------|-----------------------------|--------|-----------|-----------------|----------------|
| 6.67                     | 1242810             | 3212610                       | 28.7                        | 1.6646 | -0.569094 | 1.664           | -0.6           |

Willow Grove  
SDG 320-33018-1

Sample Identification

NAWC-110217-RW-286

Compound

Perfluorohexanesulfonic acid

|                               |             |
|-------------------------------|-------------|
| Compound Area                 | 287773      |
| Internal Standard Amount (ng) | 28.7        |
| Dilution Factor               | 1           |
| Internal Standard Area        | 3118882     |
| Average RRF                   | 1.6741      |
| Sample Volume(ml)             | 242.3       |
| Volume Extract (ml)           | 1           |
| Injection Volume (µl)         | 1           |
| Conversion factor             | 1000        |
| Concentration                 | 6.5283 ng/L |



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