



**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 320-34181-1**

*Naval Air Warfare Center Warminster
Warminster, Pennsylvania*

August 2019

N62269_001159
WARMINSTER_NAWC
SSIC 5000-33c

LABORATORY DATA PACKAGE, 320-34181-1, NAS WILLOW GROVE NAWC
WARMINSTER PA
12/21/2017
TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

ANALYTICAL REPORT

Job Number: 320-34181-1

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.
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Project Manager I
12/21/2017 10:13 AM

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Definitions/Glossary

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

TestAmerica Job ID: 320-34181-1

Qualifiers

LCMS

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

Glossary

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

Job Narrative
320-34181-1

Receipt

The samples were received on 12/12/2017 9:55 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.1° C.

LCMS

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

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

Organic Prep

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-199900.

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

Detection Summary

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

TestAmerica Job ID: 320-34181-1

Client Sample ID: WGNA-121117-RW-0488

Lab Sample ID: 320-34181-1

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|--------------------------------------|--------|-----------|-----|-----|------|---------|---|--------|-----------|
| Perfluorooctanoic acid (PFOA) | 11 | J | 22 | 3.1 | ng/L | 1 | | 537 | Total/NA |
| Perfluorohexanesulfonic acid (PFHxS) | 7.3 | J | 33 | 6.0 | ng/L | 1 | | 537 | Total/NA |
| Perfluoroheptanoic acid (PFHpA) | 5.3 | J | 11 | 2.1 | ng/L | 1 | | 537 | Total/NA |

Client Sample ID: WGNA-121117-FRB-0488

Lab Sample ID: 320-34181-2

No Detections.

Client Sample ID: NAWC-121117-RW-136

Lab Sample ID: 320-34181-3

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|-------------------------------------|--------|-----------|-----|-----|------|---------|---|--------|-----------|
| Perfluorooctanesulfonic acid (PFOS) | 8.6 | J | 41 | 6.9 | ng/L | 1 | | 537 | Total/NA |
| Perfluorooctanoic acid (PFOA) | 12 | J | 20 | 2.8 | ng/L | 1 | | 537 | Total/NA |
| Perfluoroheptanoic acid (PFHpA) | 4.5 | J | 10 | 1.9 | ng/L | 1 | | 537 | Total/NA |

Client Sample ID: NAWC-121117-FRB-136

Lab Sample ID: 320-34181-4

No Detections.

Client Sample ID: NAWC-121117-RW-040

Lab Sample ID: 320-34181-5

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|--------------------------------------|--------|-----------|-----|-----|------|---------|---|--------|-----------|
| Perfluorooctanesulfonic acid (PFOS) | 18 | J M | 40 | 6.8 | ng/L | 1 | | 537 | Total/NA |
| Perfluorooctanoic acid (PFOA) | 18 | J | 20 | 2.8 | ng/L | 1 | | 537 | Total/NA |
| Perfluorohexanesulfonic acid (PFHxS) | 7.3 | J | 30 | 5.5 | ng/L | 1 | | 537 | Total/NA |
| Perfluoroheptanoic acid (PFHpA) | 5.2 | J | 10 | 1.9 | ng/L | 1 | | 537 | Total/NA |

Client Sample ID: NAWC-121117-FRB-040

Lab Sample ID: 320-34181-6

No Detections.

Client Sample ID: WGNA-121117-RW-4846

Lab Sample ID: 320-34181-7

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|-------------------------------|--------|-----------|-----|-----|------|---------|---|--------|-----------|
| Perfluorooctanoic acid (PFOA) | 5.3 | J | 20 | 2.8 | ng/L | 1 | | 537 | Total/NA |

Client Sample ID: WGNA-121117-FRB-4846

Lab Sample ID: 320-34181-8

No Detections.

Client Sample ID: WGNA-121117-DUP14

Lab Sample ID: 320-34181-9

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|--------------------------------------|--------|-----------|-----|-----|------|---------|---|--------|-----------|
| Perfluorooctanoic acid (PFOA) | 12 | J | 20 | 2.8 | ng/L | 1 | | 537 | Total/NA |
| Perfluorohexanesulfonic acid (PFHxS) | 7.6 | J | 31 | 5.6 | ng/L | 1 | | 537 | Total/NA |
| Perfluoroheptanoic acid (PFHpA) | 5.3 | J | 10 | 1.9 | ng/L | 1 | | 537 | Total/NA |

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-34181-1

Client Sample ID: WGNA-121117-RW-0488

Lab Sample ID: 320-34181-1

Date Collected: 12/11/17 11:40

Matrix: Water

Date Received: 12/12/17 09:55

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

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|------------------|------------------|---------------|-----|------|---|-----------------|-----------------|----------------|
| Perfluorooctanesulfonic acid (PFOS) | 17 | U | 44 | 7.4 | ng/L | | 12/14/17 12:48 | 12/19/17 20:54 | 1 |
| Perfluorooctanoic acid (PFOA) | 11 | J | 22 | 3.1 | ng/L | | 12/14/17 12:48 | 12/19/17 20:54 | 1 |
| Perfluorononanoic acid (PFNA) | 22 | U | 26 | 8.7 | ng/L | | 12/14/17 12:48 | 12/19/17 20:54 | 1 |
| Perfluorohexanesulfonic acid (PFHxS) | 7.3 | J | 33 | 6.0 | ng/L | | 12/14/17 12:48 | 12/19/17 20:54 | 1 |
| Perfluoroheptanoic acid (PFHpA) | 5.3 | J | 11 | 2.1 | ng/L | | 12/14/17 12:48 | 12/19/17 20:54 | 1 |
| Perfluorobutanesulfonic acid (PFBS) | 39 | U | 98 | 18 | ng/L | | 12/14/17 12:48 | 12/19/17 20:54 | 1 |
| Surrogate | %Recovery | Qualifier | Limits | | | | Prepared | Analyzed | Dil Fac |
| 13C2 PFHxA | 98 | | 70 - 130 | | | | 12/14/17 12:48 | 12/19/17 20:54 | 1 |
| 13C2 PFDA | 100 | | 70 - 130 | | | | 12/14/17 12:48 | 12/19/17 20:54 | 1 |

Client Sample ID: WGNA-121117-FRB-0488

Lab Sample ID: 320-34181-2

Date Collected: 12/11/17 11:35

Matrix: Water

Date Received: 12/12/17 09:55

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

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|--------------------------------------|------------------|------------------|---------------|-----|------|---|-----------------|-----------------|----------------|
| Perfluorooctanesulfonic acid (PFOS) | 16 | U | 39 | 6.7 | ng/L | | 12/14/17 12:48 | 12/19/17 20:59 | 1 |
| Perfluorooctanoic acid (PFOA) | 7.9 | U | 20 | 2.8 | ng/L | | 12/14/17 12:48 | 12/19/17 20:59 | 1 |
| Perfluorononanoic acid (PFNA) | 20 | U | 24 | 7.9 | ng/L | | 12/14/17 12:48 | 12/19/17 20:59 | 1 |
| Perfluorohexanesulfonic acid (PFHxS) | 12 | U | 30 | 5.4 | ng/L | | 12/14/17 12:48 | 12/19/17 20:59 | 1 |
| Perfluoroheptanoic acid (PFHpA) | 3.9 | U | 9.9 | 1.9 | ng/L | | 12/14/17 12:48 | 12/19/17 20:59 | 1 |
| Perfluorobutanesulfonic acid (PFBS) | 35 | U | 89 | 16 | ng/L | | 12/14/17 12:48 | 12/19/17 20:59 | 1 |
| Surrogate | %Recovery | Qualifier | Limits | | | | Prepared | Analyzed | Dil Fac |
| 13C2 PFHxA | 92 | | 70 - 130 | | | | 12/14/17 12:48 | 12/19/17 20:59 | 1 |
| 13C2 PFDA | 89 | | 70 - 130 | | | | 12/14/17 12:48 | 12/19/17 20:59 | 1 |

Client Sample ID: NAWC-121117-RW-136

Lab Sample ID: 320-34181-3

Date Collected: 12/11/17 12:40

Matrix: Water

Date Received: 12/12/17 09:55

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

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|--|------------------|------------------|---------------|-----|------|---|-----------------|-----------------|----------------|
| Perfluorooctanesulfonic acid (PFOS) | 8.6 | J | 41 | 6.9 | ng/L | | 12/14/17 12:48 | 12/19/17 21:03 | 1 |
| Perfluorooctanoic acid (PFOA) | 12 | J | 20 | 2.8 | ng/L | | 12/14/17 12:48 | 12/19/17 21:03 | 1 |
| Perfluorononanoic acid (PFNA) | 20 | U M | 24 | 8.1 | ng/L | | 12/14/17 12:48 | 12/19/17 21:03 | 1 |
| Perfluorohexanesulfonic acid (PFHxS) | 12 | U M | 30 | 5.6 | ng/L | | 12/14/17 12:48 | 12/19/17 21:03 | 1 |
| Perfluoroheptanoic acid (PFHpA) | 4.5 | J | 10 | 1.9 | ng/L | | 12/14/17 12:48 | 12/19/17 21:03 | 1 |
| Perfluorobutanesulfonic acid (PFBS) | 37 | U | 91 | 16 | ng/L | | 12/14/17 12:48 | 12/19/17 21:03 | 1 |
| Surrogate | %Recovery | Qualifier | Limits | | | | Prepared | Analyzed | Dil Fac |
| 13C2 PFHxA | 85 | | 70 - 130 | | | | 12/14/17 12:48 | 12/19/17 21:03 | 1 |
| 13C2 PFDA | 87 | | 70 - 130 | | | | 12/14/17 12:48 | 12/19/17 21:03 | 1 |

Client Sample Results

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

TestAmerica Job ID: 320-34181-1

Client Sample ID: NAWC-121117-FRB-136

Lab Sample ID: 320-34181-4

Date Collected: 12/11/17 12:35

Matrix: Water

Date Received: 12/12/17 09:55

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

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|--------------------------------------|--------|-----------|-----|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS) | 16 | U | 40 | 6.8 | ng/L | | 12/14/17 12:48 | 12/19/17 21:08 | 1 |
| Perfluorooctanoic acid (PFOA) | 8.0 | U | 20 | 2.8 | ng/L | | 12/14/17 12:48 | 12/19/17 21:08 | 1 |
| Perfluorononanoic acid (PFNA) | 20 | U | 24 | 8.0 | ng/L | | 12/14/17 12:48 | 12/19/17 21:08 | 1 |
| Perfluorohexanesulfonic acid (PFHxS) | 12 | U | 30 | 5.5 | ng/L | | 12/14/17 12:48 | 12/19/17 21:08 | 1 |
| Perfluoroheptanoic acid (PFHpA) | 4.0 | U | 10 | 1.9 | ng/L | | 12/14/17 12:48 | 12/19/17 21:08 | 1 |
| Perfluorobutanesulfonic acid (PFBS) | 36 | U | 90 | 16 | ng/L | | 12/14/17 12:48 | 12/19/17 21:08 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA | 99 | | 70 - 130 | 12/14/17 12:48 | 12/19/17 21:08 | 1 |
| 13C2 PFDA | 95 | | 70 - 130 | 12/14/17 12:48 | 12/19/17 21:08 | 1 |

Client Sample ID: NAWC-121117-RW-040

Lab Sample ID: 320-34181-5

Date Collected: 12/11/17 13:10

Matrix: Water

Date Received: 12/12/17 09:55

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

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|--------------------------------------|--------|-----------|-----|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS) | 18 | J M | 40 | 6.8 | ng/L | | 12/14/17 12:48 | 12/19/17 21:13 | 1 |
| Perfluorooctanoic acid (PFOA) | 18 | J | 20 | 2.8 | ng/L | | 12/14/17 12:48 | 12/19/17 21:13 | 1 |
| Perfluorononanoic acid (PFNA) | 20 | U | 24 | 8.1 | ng/L | | 12/14/17 12:48 | 12/19/17 21:13 | 1 |
| Perfluorohexanesulfonic acid (PFHxS) | 7.3 | J | 30 | 5.5 | ng/L | | 12/14/17 12:48 | 12/19/17 21:13 | 1 |
| Perfluoroheptanoic acid (PFHpA) | 5.2 | J | 10 | 1.9 | ng/L | | 12/14/17 12:48 | 12/19/17 21:13 | 1 |
| Perfluorobutanesulfonic acid (PFBS) | 36 | U | 91 | 16 | ng/L | | 12/14/17 12:48 | 12/19/17 21:13 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA | 90 | | 70 - 130 | 12/14/17 12:48 | 12/19/17 21:13 | 1 |
| 13C2 PFDA | 97 | | 70 - 130 | 12/14/17 12:48 | 12/19/17 21:13 | 1 |

Client Sample ID: NAWC-121117-FRB-040

Lab Sample ID: 320-34181-6

Date Collected: 12/11/17 13:05

Matrix: Water

Date Received: 12/12/17 09:55

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

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|--------------------------------------|--------|-----------|-----|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS) | 16 | U | 40 | 6.9 | ng/L | | 12/14/17 12:48 | 12/19/17 21:17 | 1 |
| Perfluorooctanoic acid (PFOA) | 8.1 | U | 20 | 2.8 | ng/L | | 12/14/17 12:48 | 12/19/17 21:17 | 1 |
| Perfluorononanoic acid (PFNA) | 20 | U | 24 | 8.1 | ng/L | | 12/14/17 12:48 | 12/19/17 21:17 | 1 |
| Perfluorohexanesulfonic acid (PFHxS) | 12 | U | 30 | 5.6 | ng/L | | 12/14/17 12:48 | 12/19/17 21:17 | 1 |
| Perfluoroheptanoic acid (PFHpA) | 4.0 | U | 10 | 1.9 | ng/L | | 12/14/17 12:48 | 12/19/17 21:17 | 1 |
| Perfluorobutanesulfonic acid (PFBS) | 36 | U | 91 | 16 | ng/L | | 12/14/17 12:48 | 12/19/17 21:17 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA | 92 | | 70 - 130 | 12/14/17 12:48 | 12/19/17 21:17 | 1 |
| 13C2 PFDA | 98 | | 70 - 130 | 12/14/17 12:48 | 12/19/17 21:17 | 1 |

Client Sample Results

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

TestAmerica Job ID: 320-34181-1

Client Sample ID: WGNA-121117-RW-4846

Lab Sample ID: 320-34181-7

Date Collected: 12/11/17 14:10

Matrix: Water

Date Received: 12/12/17 09:55

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

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|--------------------------------------|------------|-----------|-----|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS) | 16 | U M | 41 | 6.9 | ng/L | | 12/14/17 12:48 | 12/19/17 21:22 | 1 |
| Perfluorooctanoic acid (PFOA) | 5.3 | J | 20 | 2.8 | ng/L | | 12/14/17 12:48 | 12/19/17 21:22 | 1 |
| Perfluorononanoic acid (PFNA) | 20 | U | 24 | 8.1 | ng/L | | 12/14/17 12:48 | 12/19/17 21:22 | 1 |
| Perfluorohexanesulfonic acid (PFHxS) | 12 | U M | 30 | 5.6 | ng/L | | 12/14/17 12:48 | 12/19/17 21:22 | 1 |
| Perfluoroheptanoic acid (PFHpA) | 4.1 | U M | 10 | 1.9 | ng/L | | 12/14/17 12:48 | 12/19/17 21:22 | 1 |
| Perfluorobutanesulfonic acid (PFBS) | 36 | U M | 91 | 16 | ng/L | | 12/14/17 12:48 | 12/19/17 21:22 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA | 88 | | 70 - 130 | 12/14/17 12:48 | 12/19/17 21:22 | 1 |
| 13C2 PFDA | 87 | | 70 - 130 | 12/14/17 12:48 | 12/19/17 21:22 | 1 |

Client Sample ID: WGNA-121117-FRB-4846

Lab Sample ID: 320-34181-8

Date Collected: 12/11/17 14:05

Matrix: Water

Date Received: 12/12/17 09:55

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

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|--------------------------------------|--------|-----------|-----|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS) | 16 | U | 40 | 6.8 | ng/L | | 12/14/17 12:48 | 12/19/17 21:36 | 1 |
| Perfluorooctanoic acid (PFOA) | 8.0 | U | 20 | 2.8 | ng/L | | 12/14/17 12:48 | 12/19/17 21:36 | 1 |
| Perfluorononanoic acid (PFNA) | 20 | U | 24 | 8.0 | ng/L | | 12/14/17 12:48 | 12/19/17 21:36 | 1 |
| Perfluorohexanesulfonic acid (PFHxS) | 12 | U | 30 | 5.5 | ng/L | | 12/14/17 12:48 | 12/19/17 21:36 | 1 |
| Perfluoroheptanoic acid (PFHpA) | 4.0 | U | 10 | 1.9 | ng/L | | 12/14/17 12:48 | 12/19/17 21:36 | 1 |
| Perfluorobutanesulfonic acid (PFBS) | 36 | U | 90 | 16 | ng/L | | 12/14/17 12:48 | 12/19/17 21:36 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA | 91 | | 70 - 130 | 12/14/17 12:48 | 12/19/17 21:36 | 1 |
| 13C2 PFDA | 98 | | 70 - 130 | 12/14/17 12:48 | 12/19/17 21:36 | 1 |

Client Sample ID: WGNA-121117-DUP14

Lab Sample ID: 320-34181-9

Date Collected: 12/11/17 07:00

Matrix: Water

Date Received: 12/12/17 09:55

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

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|------------|-----------|-----|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS) | 16 | U | 41 | 6.9 | ng/L | | 12/14/17 12:48 | 12/19/17 21:41 | 1 |
| Perfluorooctanoic acid (PFOA) | 12 | J | 20 | 2.8 | ng/L | | 12/14/17 12:48 | 12/19/17 21:41 | 1 |
| Perfluorononanoic acid (PFNA) | 20 | U | 24 | 8.1 | ng/L | | 12/14/17 12:48 | 12/19/17 21:41 | 1 |
| Perfluorohexanesulfonic acid (PFHxS) | 7.6 | J | 31 | 5.6 | ng/L | | 12/14/17 12:48 | 12/19/17 21:41 | 1 |
| Perfluoroheptanoic acid (PFHpA) | 5.3 | J | 10 | 1.9 | ng/L | | 12/14/17 12:48 | 12/19/17 21:41 | 1 |
| Perfluorobutanesulfonic acid (PFBS) | 37 | U | 92 | 16 | ng/L | | 12/14/17 12:48 | 12/19/17 21:41 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA | 96 | | 70 - 130 | 12/14/17 12:48 | 12/19/17 21:41 | 1 |
| 13C2 PFDA | 90 | | 70 - 130 | 12/14/17 12:48 | 12/19/17 21:41 | 1 |

Default Detection Limits

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

TestAmerica Job ID: 320-34181-1

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

Prep: 537

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

Surrogate Summary

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

TestAmerica Job ID: 320-34181-1

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

Matrix: Water

Prep Type: Total/NA

| Lab Sample ID | Client Sample ID | Percent Surrogate Recovery (Acceptance Limits) | |
|---------------------|------------------------|--|------------------|
| | | PFHxA (70-130) | PFDA (70-130) |
| 320-34181-1 | WGNA-121117-RW-0488 | 98 | 100 |
| 320-34181-2 | WGNA-121117-FRB-0488 | 92 | 89 |
| 320-34181-3 | NAWC-121117-RW-136 | 85 | 87 |
| 320-34181-4 | NAWC-121117-FRB-136 | 99 | 95 |
| 320-34181-5 | NAWC-121117-RW-040 | 90 | 97 |
| 320-34181-6 | NAWC-121117-FRB-040 | 92 | 98 |
| 320-34181-7 | WGNA-121117-RW-4846 | 88 | 87 |
| 320-34181-8 | WGNA-121117-FRB-4846 | 91 | 98 |
| 320-34181-9 | WGNA-121117-DUP14 | 96 | 90 |
| LCS 320-199900/2-A | Lab Control Sample | 97 | 98 |
| LCSD 320-199900/3-A | Lab Control Sample Dup | 97 | 103 |
| MB 320-199900/1-A | Method Blank | 93 | 96 |

Surrogate Legend

PFHxA = 13C2 PFHxA

PFDA = 13C2 PFDA

QC Sample Results

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

TestAmerica Job ID: 320-34181-1

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

Lab Sample ID: MB 320-199900/1-A
Matrix: Water
Analysis Batch: 200646

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 199900

| Analyte | MB | MB | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|--------------------------------------|--------|-----------|-----|-----|------|---|----------------|----------------|---------|
| | Result | Qualifier | | | | | | | |
| Perfluorooctanesulfonic acid (PFOS) | 16 | U | 40 | 6.8 | ng/L | | 12/14/17 12:48 | 12/19/17 20:40 | 1 |
| Perfluorooctanoic acid (PFOA) | 8.0 | U | 20 | 2.8 | ng/L | | 12/14/17 12:48 | 12/19/17 20:40 | 1 |
| Perfluorononanoic acid (PFNA) | 20 | U | 24 | 8.0 | ng/L | | 12/14/17 12:48 | 12/19/17 20:40 | 1 |
| Perfluorohexanesulfonic acid (PFHxS) | 12 | U | 30 | 5.5 | ng/L | | 12/14/17 12:48 | 12/19/17 20:40 | 1 |
| Perfluoroheptanoic acid (PFHpA) | 4.0 | U | 10 | 1.9 | ng/L | | 12/14/17 12:48 | 12/19/17 20:40 | 1 |
| Perfluorobutanesulfonic acid (PFBS) | 36 | U | 90 | 16 | ng/L | | 12/14/17 12:48 | 12/19/17 20:40 | 1 |

| Surrogate | MB | MB | Limits | Prepared | Analyzed | Dil Fac |
|------------|-----------|-----------|----------|----------------|----------------|---------|
| | %Recovery | Qualifier | | | | |
| 13C2 PFHxA | 93 | | 70 - 130 | 12/14/17 12:48 | 12/19/17 20:40 | 1 |
| 13C2 PFDA | 96 | | 70 - 130 | 12/14/17 12:48 | 12/19/17 20:40 | 1 |

Lab Sample ID: LCS 320-199900/2-A
Matrix: Water
Analysis Batch: 200646

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 199900

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|--------------------------------------|-------------|------------|---------------|------|---|------|--------------|
| | | | | | | | |
| Perfluorooctanoic acid (PFOA) | 111 | 110 | | ng/L | | 99 | 70 - 130 |
| Perfluorononanoic acid (PFNA) | 111 | 109 | | ng/L | | 98 | 70 - 130 |
| Perfluorohexanesulfonic acid (PFHxS) | 167 | 183 | | ng/L | | 110 | 70 - 130 |
| Perfluoroheptanoic acid (PFHpA) | 55.6 | 62.1 | | ng/L | | 112 | 70 - 130 |
| Perfluorobutanesulfonic acid (PFBS) | 500 | 494 | | ng/L | | 99 | 70 - 130 |

| Surrogate | LCS | LCS | Limits |
|------------|-----------|-----------|----------|
| | %Recovery | Qualifier | |
| 13C2 PFHxA | 97 | | 70 - 130 |
| 13C2 PFDA | 98 | | 70 - 130 |

Lab Sample ID: LCSD 320-199900/3-A
Matrix: Water
Analysis Batch: 200646

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 199900

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|--------------------------------------|-------------|-------------|----------------|------|---|------|--------------|-----|-----------|
| | | | | | | | | | |
| Perfluorooctanoic acid (PFOA) | 111 | 109 | | ng/L | | 98 | 70 - 130 | 1 | 30 |
| Perfluorononanoic acid (PFNA) | 111 | 106 | | ng/L | | 95 | 70 - 130 | 3 | 30 |
| Perfluorohexanesulfonic acid (PFHxS) | 167 | 174 | | ng/L | | 104 | 70 - 130 | 5 | 30 |
| Perfluoroheptanoic acid (PFHpA) | 55.6 | 60.0 | | ng/L | | 108 | 70 - 130 | 3 | 30 |
| Perfluorobutanesulfonic acid (PFBS) | 500 | 480 | | ng/L | | 96 | 70 - 130 | 3 | 30 |

| Surrogate | LCSD | LCSD | Limits |
|------------|-----------|-----------|----------|
| | %Recovery | Qualifier | |
| 13C2 PFHxA | 97 | | 70 - 130 |
| 13C2 PFDA | 103 | | 70 - 130 |

TestAmerica Sacramento

QC Association Summary

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

TestAmerica Job ID: 320-34181-1

LCMS

Prep Batch: 199900

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---------------------|------------------------|-----------|--------|--------|------------|
| 320-34181-1 | WGNA-121117-RW-0488 | Total/NA | Water | 537 | |
| 320-34181-2 | WGNA-121117-FRB-0488 | Total/NA | Water | 537 | |
| 320-34181-3 | NAWC-121117-RW-136 | Total/NA | Water | 537 | |
| 320-34181-4 | NAWC-121117-FRB-136 | Total/NA | Water | 537 | |
| 320-34181-5 | NAWC-121117-RW-040 | Total/NA | Water | 537 | |
| 320-34181-6 | NAWC-121117-FRB-040 | Total/NA | Water | 537 | |
| 320-34181-7 | WGNA-121117-RW-4846 | Total/NA | Water | 537 | |
| 320-34181-8 | WGNA-121117-FRB-4846 | Total/NA | Water | 537 | |
| 320-34181-9 | WGNA-121117-DUP14 | Total/NA | Water | 537 | |
| MB 320-199900/1-A | Method Blank | Total/NA | Water | 537 | |
| LCS 320-199900/2-A | Lab Control Sample | Total/NA | Water | 537 | |
| LCSD 320-199900/3-A | Lab Control Sample Dup | Total/NA | Water | 537 | |

Analysis Batch: 200646

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---------------------|------------------------|-----------|--------|--------|------------|
| 320-34181-1 | WGNA-121117-RW-0488 | Total/NA | Water | 537 | 199900 |
| 320-34181-2 | WGNA-121117-FRB-0488 | Total/NA | Water | 537 | 199900 |
| 320-34181-3 | NAWC-121117-RW-136 | Total/NA | Water | 537 | 199900 |
| 320-34181-4 | NAWC-121117-FRB-136 | Total/NA | Water | 537 | 199900 |
| 320-34181-5 | NAWC-121117-RW-040 | Total/NA | Water | 537 | 199900 |
| 320-34181-6 | NAWC-121117-FRB-040 | Total/NA | Water | 537 | 199900 |
| 320-34181-7 | WGNA-121117-RW-4846 | Total/NA | Water | 537 | 199900 |
| MB 320-199900/1-A | Method Blank | Total/NA | Water | 537 | 199900 |
| LCS 320-199900/2-A | Lab Control Sample | Total/NA | Water | 537 | 199900 |
| LCSD 320-199900/3-A | Lab Control Sample Dup | Total/NA | Water | 537 | 199900 |

Analysis Batch: 200767

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---------------|----------------------|-----------|--------|--------|------------|
| 320-34181-8 | WGNA-121117-FRB-4846 | Total/NA | Water | 537 | 199900 |
| 320-34181-9 | WGNA-121117-DUP14 | Total/NA | Water | 537 | 199900 |

Lab Chronicle

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

TestAmerica Job ID: 320-34181-1

Client Sample ID: WGNA-121117-RW-0488

Date Collected: 12/11/17 11:40

Date Received: 12/12/17 09:55

Lab Sample ID: 320-34181-1

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA | Prep | 537 | | | 199900 | 12/14/17 12:48 | KMK | TAL SAC |
| Total/NA | Analysis | 537 | | 1 | 200646 | 12/19/17 20:54 | JRB | TAL SAC |

Client Sample ID: WGNA-121117-FRB-0488

Date Collected: 12/11/17 11:35

Date Received: 12/12/17 09:55

Lab Sample ID: 320-34181-2

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA | Prep | 537 | | | 199900 | 12/14/17 12:48 | KMK | TAL SAC |
| Total/NA | Analysis | 537 | | 1 | 200646 | 12/19/17 20:59 | JRB | TAL SAC |

Client Sample ID: NAWC-121117-RW-136

Date Collected: 12/11/17 12:40

Date Received: 12/12/17 09:55

Lab Sample ID: 320-34181-3

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA | Prep | 537 | | | 199900 | 12/14/17 12:48 | KMK | TAL SAC |
| Total/NA | Analysis | 537 | | 1 | 200646 | 12/19/17 21:03 | JRB | TAL SAC |

Client Sample ID: NAWC-121117-FRB-136

Date Collected: 12/11/17 12:35

Date Received: 12/12/17 09:55

Lab Sample ID: 320-34181-4

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA | Prep | 537 | | | 199900 | 12/14/17 12:48 | KMK | TAL SAC |
| Total/NA | Analysis | 537 | | 1 | 200646 | 12/19/17 21:08 | JRB | TAL SAC |

Client Sample ID: NAWC-121117-RW-040

Date Collected: 12/11/17 13:10

Date Received: 12/12/17 09:55

Lab Sample ID: 320-34181-5

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA | Prep | 537 | | | 199900 | 12/14/17 12:48 | KMK | TAL SAC |
| Total/NA | Analysis | 537 | | 1 | 200646 | 12/19/17 21:13 | JRB | TAL SAC |

Client Sample ID: NAWC-121117-FRB-040

Date Collected: 12/11/17 13:05

Date Received: 12/12/17 09:55

Lab Sample ID: 320-34181-6

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA | Prep | 537 | | | 199900 | 12/14/17 12:48 | KMK | TAL SAC |
| Total/NA | Analysis | 537 | | 1 | 200646 | 12/19/17 21:17 | JRB | TAL SAC |

TestAmerica Sacramento

Lab Chronicle

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

TestAmerica Job ID: 320-34181-1

Client Sample ID: WGNA-121117-RW-4846

Date Collected: 12/11/17 14:10

Date Received: 12/12/17 09:55

Lab Sample ID: 320-34181-7

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA | Prep | 537 | | | 199900 | 12/14/17 12:48 | KMK | TAL SAC |
| Total/NA | Analysis | 537 | | 1 | 200646 | 12/19/17 21:22 | JRB | TAL SAC |

Client Sample ID: WGNA-121117-FRB-4846

Date Collected: 12/11/17 14:05

Date Received: 12/12/17 09:55

Lab Sample ID: 320-34181-8

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA | Prep | 537 | | | 199900 | 12/14/17 12:48 | KMK | TAL SAC |
| Total/NA | Analysis | 537 | | 1 | 200767 | 12/19/17 21:36 | JRB | TAL SAC |

Client Sample ID: WGNA-121117-DUP14

Date Collected: 12/11/17 07:00

Date Received: 12/12/17 09:55

Lab Sample ID: 320-34181-9

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA | Prep | 537 | | | 199900 | 12/14/17 12:48 | KMK | TAL SAC |
| Total/NA | Analysis | 537 | | 1 | 200767 | 12/19/17 21:41 | 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: 320-34181-1

Laboratory: TestAmerica Sacramento

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

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

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

Method Summary

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

TestAmerica Job ID: 320-34181-1

| 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: 320-34181-1

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

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---------------|----------------------|--------|----------------|----------------|
| 320-34181-1 | WGNA-121117-RW-0488 | Water | 12/11/17 11:40 | 12/12/17 09:55 |
| 320-34181-2 | WGNA-121117-FRB-0488 | Water | 12/11/17 11:35 | 12/12/17 09:55 |
| 320-34181-3 | NAWC-121117-RW-136 | Water | 12/11/17 12:40 | 12/12/17 09:55 |
| 320-34181-4 | NAWC-121117-FRB-136 | Water | 12/11/17 12:35 | 12/12/17 09:55 |
| 320-34181-5 | NAWC-121117-RW-040 | Water | 12/11/17 13:10 | 12/12/17 09:55 |
| 320-34181-6 | NAWC-121117-FRB-040 | Water | 12/11/17 13:05 | 12/12/17 09:55 |
| 320-34181-7 | WGNA-121117-RW-4846 | Water | 12/11/17 14:10 | 12/12/17 09:55 |
| 320-34181-8 | WGNA-121117-FRB-4846 | Water | 12/11/17 14:05 | 12/12/17 09:55 |
| 320-34181-9 | WGNA-121117-DUP14 | Water | 12/11/17 07:00 | 12/12/17 09:55 |

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 192908

Lab Sample ID: IC 320-192908/4 Client Sample ID: _____

Date Analyzed: 11/03/17 13:37 Lab File ID: 2017.11.03_537XICAL_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

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

Lab Sample ID: IC 320-192908/5 Client Sample ID: _____

Date Analyzed: 11/03/17 13:42 Lab File ID: 2017.11.03_537XICAL_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

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

Lab Sample ID: IC 320-192908/7 ICISAV Client Sample ID: _____

Date Analyzed: 11/03/17 13:52 Lab File ID: 2017.11.03_537XICAL_007.d GC Column: GeminiC18 3x1 ID: 3(mm)

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

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 200292

Lab Sample ID: CCVL 320-200292/1 Client Sample ID: _____

Date Analyzed: 12/18/17 09:53 Lab File ID: 2017.12.18_537A_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

| COMPOUND NAME | RETENTION TIME | MANUAL INTEGRATION | | |
|-------------------------------------|----------------|--------------------|-----------|----------------|
| | | REASON | ANALYST | DATE |
| Perfluorooctanesulfonic acid (PFOS) | 2.12 | Assign Peak | hannigana | 12/18/17 10:44 |

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 200646

Lab Sample ID: CCV 320-200646/1 CCVIS Client Sample ID: _____

Date Analyzed: 12/19/17 20:31 Lab File ID: 2017.12.19_537A_050.d GC Column: GeminiC18 3x1 ID: 3(mm)

| COMPOUND NAME | RETENTION TIME | MANUAL INTEGRATION | | |
|-------------------------------------|----------------|--------------------|----------|----------------|
| | | REASON | ANALYST | DATE |
| Perfluorooctanesulfonic acid (PFOS) | 2.06 | Missed Peak | barnettj | 12/20/17 14:18 |

Lab Sample ID: LCS 320-199900/2-A Client Sample ID: _____

Date Analyzed: 12/19/17 20:45 Lab File ID: 2017.12.19_537A_053.d GC Column: GeminiC18 3x1 ID: 3(mm)

| COMPOUND NAME | RETENTION TIME | MANUAL INTEGRATION | | |
|-------------------------------------|----------------|--------------------|----------|----------------|
| | | REASON | ANALYST | DATE |
| Perfluorooctanesulfonic acid (PFOS) | 2.07 | Missed Peak | barnettj | 12/20/17 14:20 |

Lab Sample ID: LCSD 320-199900/3-A Client Sample ID: _____

Date Analyzed: 12/19/17 20:49 Lab File ID: 2017.12.19_537A_054.d GC Column: GeminiC18 3x1 ID: 3(mm)

| COMPOUND NAME | RETENTION TIME | MANUAL INTEGRATION | | |
|-------------------------------------|----------------|--------------------|----------|----------------|
| | | REASON | ANALYST | DATE |
| Perfluorooctanesulfonic acid (PFOS) | 2.07 | Missed Peak | barnettj | 12/20/17 14:21 |

Lab Sample ID: 320-34181-3 Client Sample ID: NAWC-121117-RW-136

Date Analyzed: 12/19/17 21:03 Lab File ID: 2017.12.19_537A_057.d GC Column: GeminiC18 3x1 ID: 3(mm)

| COMPOUND NAME | RETENTION TIME | MANUAL INTEGRATION | | |
|--------------------------------------|----------------|--------------------|----------|----------------|
| | | REASON | ANALYST | DATE |
| Perfluorohexanesulfonic acid (PFHxS) | 1.62 | Missed Peak | barnettj | 12/20/17 14:24 |
| Perfluorononanoic acid (PFNA) | 2.07 | Missed Peak | barnettj | 12/20/17 14:24 |

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 200646

Lab Sample ID: 320-34181-5 Client Sample ID: NAWC-121117-RW-040

Date Analyzed: 12/19/17 21:13 Lab File ID: 2017.12.19_537A_059.d GC Column: GeminiC18 3x1 ID: 3(mm)

| COMPOUND NAME | RETENTION TIME | MANUAL INTEGRATION | | |
|-------------------------------------|----------------|--------------------|----------|----------------|
| | | REASON | ANALYST | DATE |
| Perfluorooctanesulfonic acid (PFOS) | 2.07 | Missed Peak | barnettj | 12/20/17 14:25 |

Lab Sample ID: 320-34181-7 Client Sample ID: WGNA-121117-RW-4846

Date Analyzed: 12/19/17 21:22 Lab File ID: 2017.12.19_537A_061.d GC Column: GeminiC18 3x1 ID: 3(mm)

| COMPOUND NAME | RETENTION TIME | MANUAL INTEGRATION | | |
|--------------------------------------|----------------|--------------------|----------|----------------|
| | | REASON | ANALYST | DATE |
| Perfluorobutanesulfonic acid (PFBS) | 1.37 | Missed Peak | barnettj | 12/20/17 14:27 |
| Perfluoroheptanoic acid (PFHpA) | 1.63 | Missed Peak | barnettj | 12/20/17 14:27 |
| Perfluorohexanesulfonic acid (PFHxS) | 1.63 | Missed Peak | barnettj | 12/20/17 14:27 |
| Perfluorooctanesulfonic acid (PFOS) | 1.97 | Missed Peak | barnettj | 12/20/17 14:27 |

Lab Sample ID: CCV 320-200646/13 CCVIS Client Sample ID: _____

Date Analyzed: 12/19/17 21:27 Lab File ID: 2017.12.19_537A_062.d GC Column: GeminiC18 3x1 ID: 3(mm)

| COMPOUND NAME | RETENTION TIME | MANUAL INTEGRATION | | |
|-------------------------------------|----------------|--------------------|----------|----------------|
| | | REASON | ANALYST | DATE |
| Perfluorooctanesulfonic acid (PFOS) | 2.06 | Missed Peak | barnettj | 12/20/17 14:19 |

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 200767

Lab Sample ID: CCV 320-200767/13 CCVIS Client Sample ID: _____

Date Analyzed: 12/19/17 21:27 Lab File ID: 2017.12.19_537A_062.d GC Column: GeminiC18 3x1 ID: 3(mm)

| COMPOUND NAME | RETENTION TIME | MANUAL INTEGRATION | | |
|-------------------------------------|----------------|--------------------|----------|----------------|
| | | REASON | ANALYST | DATE |
| Perfluorooctanesulfonic acid (PFOS) | 2.06 | Missed Peak | barnettj | 12/20/17 14:19 |

Lab Sample ID: CCV 320-200767/21 CCVIS Client Sample ID: _____

Date Analyzed: 12/19/17 22:04 Lab File ID: 2017.12.19_537A_070.d GC Column: GeminiC18 3x1 ID: 3(mm)

| COMPOUND NAME | RETENTION TIME | MANUAL INTEGRATION | | |
|-------------------------------------|----------------|--------------------|----------|----------------|
| | | REASON | ANALYST | DATE |
| Perfluorooctanesulfonic acid (PFOS) | 2.07 | Missed Peak | barnettj | 12/20/17 14:19 |

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-34181-1

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 | | |
| .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 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 49.6 mL | LC537_PFOS_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.: 320-34181-1

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_00054 | 05/27/18 | 11/27/17 | Methanol, Lot 090285 | 30000 uL | LCM2PFOA_00007 | 60 uL | 13C2-PFOA | 0.1 ug/mL |
| | | | | | LCMPFOS_00021 | 180 uL | 13C4 PFOS | 0.2868 ug/mL |

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-34181-1

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 | 50 ug/mL | | |
| .LCMPFOS_00021 | 12/12/21 | | Wellington Laboratories, Lot MPFOS1216 | | (Purchased Reagent) | | 13C4 PFOS | 47.8 ug/mL | | |
| .LC537-MSP_00029 | 02/10/18 | 08/10/17 | Methanol, Lot 141039 | 20000 uL | LC537SPIM_00023 | 166.7 uL | Perfluorobutanesulfonic acid (PFBS) | 750.15 ng/mL | | |
| | | | | | | | Perfluoroheptanoic acid (PFHpA) | 83.3637 ng/mL | | |
| | | | | | | | Perfluorohexanesulfonic acid (PFHxS) | 250.086 ng/mL | | |
| | | | | | | | Perfluorononanoic acid (PFNA) | 166.716 ng/mL | | |
| | | | | | | | Perfluorooctanoic acid (PFOA) | 166.826 ng/mL | | |
| | | | | | | | Perfluorooctanesulfonic acid (PFOS) | 333.455 ng/mL | | |
| ..LC537SPIM_00023 | 02/10/18 | 08/10/17 | Methanol, Lot 104453 | 10000 uL | LC537-PFBS_00008 | 450 uL | Perfluorobutanesulfonic acid (PFBS) | 90 ug/mL | | |
| | | | | | | | LC537-PFHpA_00015 | 100 uL | Perfluoroheptanoic acid (PFHpA) | 10.0016 ug/mL |
| | | | | | | | LC537-PFHxS_00010 | 150 uL | Perfluorohexanesulfonic acid (PFHxS) | 30.0043 ug/mL |
| | | | | | | | LC537-PFNA_00013 | 200 uL | Perfluorononanoic acid (PFNA) | 20.002 ug/mL |
| | | | | | | | LC537-PFOA_00013 | 200 uL | Perfluorooctanoic acid (PFOA) | 20.0151 ug/mL |
| | | | | | | | LC537-PFOS_00008 | 400 uL | Perfluorooctanesulfonic acid (PFOS) | 40.0066 ug/mL |
| ...LC537-PFBS_00008 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 49.6 mL | LC537_PFBS_00002 | 0.0992 g | Perfluorobutanesulfonic acid (PFBS) | 2 mg/mL | | |
|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.: 320-34181-1

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 |
| LC537-L2_00020 | 02/04/18 | 08/14/17 | MeOH/H2O, Lot 090285 | 5 mL | LC537-HSP_00025 | 80 uL | Perfluorobutanesulfonic acid (PFBS) | 20.0016 ng/mL |
| | | | | | | | Perfluoroheptanoic acid (PFHpA) | 2.22277 ng/mL |
| | | | | | | | Perfluorohexanesulfonic acid (PFHxS) | 6.66817 ng/mL |
| | | | | | | | Perfluorononanoic acid (PFNA) | 4.44524 ng/mL |
| | | | | | | | Perfluorooctanoic acid (PFOA) | 4.44816 ng/mL |
| | | | | | | | Perfluorooctanesulfonic acid (PFOS) | 8.89106 ng/mL |
| | | | | | LC537-IS_00048 | 500 uL | 13C2-PFOA | 10 ng/mL |
| | | | | | | | 13C4 PFOS | 28.68 ng/mL |
| | | | | | LC537-SU_00049 | 500 uL | 13C2 PFDA | 10 ng/mL |
| | | | | | | | 13C2 PFHxA | 10 ng/mL |
| .LC537-HSP_00025 | 02/10/18 | 08/10/17 | Methanol, Lot 141039 | 20000 uL | LC537SPIM_00023 | 277.8 uL | Perfluorobutanesulfonic acid (PFBS) | 1250.1 ng/mL |
| | | | | | | | Perfluoroheptanoic acid (PFHpA) | 138.923 ng/mL |
| | | | | | | | Perfluorohexanesulfonic acid (PFHxS) | 416.76 ng/mL |
| | | | | | | | Perfluorononanoic acid (PFNA) | 277.827 ng/mL |
| | | | | | | | Perfluorooctanoic acid (PFOA) | 278.01 ng/mL |
| | | | | | | | Perfluorooctanesulfonic acid (PFOS) | 555.691 ng/mL |
| ..LC537SPIM_00023 | 02/10/18 | 08/10/17 | Methanol, Lot 104453 | 10000 uL | LC537-PFBS_00008 | 450 uL | Perfluorobutanesulfonic acid (PFBS) | 90 ug/mL |
| | | | | | 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.: 320-34181-1

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 BCM2579V | | (Purchased Reagent) | | Perfluoroheptanoic acid (PFHpA) | 0.99 g/g |
| ...LC537-PFHxS_00010 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 55.92 mL | LC537_PFHxS_00002 | 0.123 g | Perfluorohexanesulfonic acid (PFHxS) | 2.00029 mg/mL |
|LC537_PFHxS_00002 | 04/01/18 | | Sigma, Lot BCBL3545V | | (Purchased Reagent) | | Perfluorohexanesulfonic acid (PFHxS) | 0.9094 g/g |
| ...LC537-PFNA_00013 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 62.3 mL | LC537 PFNA_00002 | 0.0647 g | Perfluorononanoic acid (PFNA) | 1000.1 ug/mL |
|LC537 PFNA_00002 | 04/01/18 | | TCI America, Lot QN44F | | (Purchased Reagent) | | Perfluorononanoic acid (PFNA) | 0.963 g/g |
| ...LC537-PFOA_00013 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 22.76 mL | LC537_PFOA_00003 | 0.0228 g | Perfluorooctanoic acid (PFOA) | 1.00076 mg/mL |
|LC537_PFOA_00003 | 10/31/23 | | SIGMA ALDRICH, Lot BCBS1198V | | (Purchased Reagent) | | Perfluorooctanoic acid (PFOA) | 0.999 g/g |
| ...LC537-PFOS_00008 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 44.43 mL | LC537_PFOS_00003 | 0.0488 g | Perfluorooctanesulfonic acid (PFOS) | 1.00016 mg/mL |
|LC537_PFOS_00003 | 04/17/19 | | sigma alrich, Lot SZBE107XV | | (Purchased Reagent) | | Perfluorooctanesulfonic acid (PFOS) | 0.9106 g/g |
| .LC537-IS_00048 | 02/04/18 | 08/04/17 | Methanol, Lot 090285 | 30000 uL | LCM2PFOA_00007 | 60 uL | 13C2-PFOA | 0.1 ug/mL |
| | | | | | LCMPFOS_00021 | 180 uL | 13C4 PFOS | 0.2868 ug/mL |
| ..LCM2PFOA_00007 | 02/12/21 | | Wellington Laboratories, Lot M2PFOA0216 | | (Purchased Reagent) | | 13C2-PFOA | 50 ug/mL |
| ..LCMPFOS_00021 | 12/12/21 | | Wellington Laboratories, Lot MPFOS1216 | | (Purchased Reagent) | | 13C4 PFOS | 47.8 ug/mL |
| .LC537-SU_00049 | 02/04/18 | 08/04/17 | Methanol, Lot 104453 | 30000 uL | LCMPFDA_00012 | 60 uL | 13C2 PFDA | 0.1 ug/mL |
| | | | | | LCMPFHxA_00013 | 60 uL | 13C2 PFHxA | 0.1 ug/mL |
| ..LCMPFDA_00012 | 09/30/21 | | Wellington Laboratories, Lot MPFDA0916 | | (Purchased Reagent) | | 13C2 PFDA | 50 ug/mL |
| ..LCMPFHxA_00013 | 04/08/21 | | Wellington Laboratories, Lot MPFHxA0416 | | (Purchased Reagent) | | 13C2 PFHxA | 50 ug/mL |
| LC537-L3_00023 | 02/04/18 | 08/14/17 | MeOH/H2O, Lot 090285 | 5 mL | LC537-HSP_00025 | 180 uL | Perfluorobutanesulfonic acid (PFBS) | 45.0036 ng/mL |
| | | | | | | | Perfluoroheptanoic acid (PFHpA) | 5.00122 ng/mL |
| | | | | | | | Perfluorohexanesulfonic acid (PFHxS) | 15.0034 ng/mL |
| | | | | | | | Perfluorononanoic acid (PFNA) | 10.0018 ng/mL |
| | | | | | | | Perfluorooctanoic acid (PFOA) | 10.0084 ng/mL |
| | | | | | | | Perfluorooctanesulfonic acid (PFOS) | 20.0049 ng/mL |
| | | | | | LC537-IS_00048 | 500 uL | 13C2-PFOA | 10 ng/mL |
| | | | | | | | 13C4 PFOS | 28.68 ng/mL |
| | | | | | LC537-SU_00049 | 500 uL | 13C2 PFDA | 10 ng/mL |
| | | | | | | | 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 |

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-34181-1

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 |
| | | | | | | | 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) | | 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 |
| | | | | | | | 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 |
| | | | | | | | 13C2 PFHxA | 0.1 ug/mL |
| ..LCMPFDA_00012 | 09/30/21 | | Wellington Laboratories, Lot MPFDA0916 | | (Purchased Reagent) | | 13C2 PFDA | 50 ug/mL |
| ..LCMPFHxA_00013 | 04/08/21 | | Wellington Laboratories, Lot MPFHxA0416 | | (Purchased Reagent) | | 13C2 PFHxA | 50 ug/mL |
| LC537-L4_00020 | 02/04/18 | 08/14/17 | MeOH/H2O, Lot 090285 | 5 mL | LC537-HSP_00025 | 360 uL | Perfluorobutanesulfonic acid (PFBS) | 90.0072 ng/mL |
| | | | | | | | Perfluoroheptanoic acid (PFHpA) | 10.0024 ng/mL |

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-34181-1

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 |
| | | | | | | | | | 13C4 PFOS | 28.68 ng/mL |
| ..LC537-HSP_00025 | 02/10/18 | 08/10/17 | Methanol, Lot 141039 | 20000 uL | LC537SPIM_00023 | 277.8 uL | 13C2 PFDA | 10 ng/mL | | |
| | | | | | | | 13C2 PFHxA | 10 ng/mL | | |
| | | | | | | | Perfluorobutanesulfonic acid (PFBS) | 1250.1 ng/mL | | |
| | | | | | | | Perfluoroheptanoic acid (PFHpA) | 138.923 ng/mL | | |
| | | | | | | | Perfluorohexanesulfonic acid (PFHxS) | 416.76 ng/mL | | |
| | | | | | | | Perfluorononanoic acid (PFNA) | 277.827 ng/mL | | |
| | | Perfluorooctanoic acid (PFOA) | 278.01 ng/mL | | | | | | | |
| | | Perfluorooctanesulfonic acid (PFOS) | 555.691 ng/mL | | | | | | | |
| ..LC537SPIM_00023 | 02/10/18 | 08/10/17 | Methanol, Lot 104453 | 10000 uL | LC537-PFBS_00008 | 450 uL | Perfluorobutanesulfonic acid (PFBS) | 90 ug/mL | | |
| | | | | | | | LC537-PFHpA_00015 | 100 uL | Perfluoroheptanoic acid (PFHpA) | 10.0016 ug/mL |
| | | | | | | | LC537-PFHxS_00010 | 150 uL | Perfluorohexanesulfonic acid (PFHxS) | 30.0043 ug/mL |
| | | | | | | | LC537-PFNA_00013 | 200 uL | Perfluorononanoic acid (PFNA) | 20.002 ug/mL |
| | | | | | | | LC537-PFOA_00013 | 200 uL | Perfluorooctanoic acid (PFOA) | 20.0151 ug/mL |
| | | | | | | | LC537-PFOS_00008 | 400 uL | Perfluorooctanesulfonic acid (PFOS) | 40.0066 ug/mL |
| ...LC537-PFBS_00008 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 49.6 mL | LC537_PFBS_00002 | 0.0992 g | Perfluorobutanesulfonic acid (PFBS) | 2 mg/mL | | |
|LC537_PFBS_00002 | 04/01/18 | Sigma, Lot MKBP8842V | | | (Purchased Reagent) | | Perfluorobutanesulfonic acid (PFBS) | 1 g/g | | |
| ...LC537-PFHpA_00015 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 48.7 mL | LC537_PFHpA_00002 | 0.0492 g | Perfluoroheptanoic acid (PFHpA) | 1.00016 mg/mL | | |
|LC537_PFHpA_00002 | 04/01/18 | Aldrich, Lot BCBM2579V | | | (Purchased Reagent) | | Perfluoroheptanoic acid (PFHpA) | 0.99 g/g | | |
| ...LC537-PFHxS_00010 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 55.92 mL | LC537_PFHxS_00002 | 0.123 g | Perfluorohexanesulfonic acid (PFHxS) | 2.00029 mg/mL | | |
|LC537_PFHxS_00002 | 04/01/18 | Sigma, Lot BCBL3545V | | | (Purchased Reagent) | | Perfluorohexanesulfonic acid (PFHxS) | 0.9094 g/g | | |
| ...LC537-PFNA_00013 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 62.3 mL | LC537 PFNA_00002 | 0.0647 g | Perfluorononanoic acid (PFNA) | 1000.1 ug/mL | | |
|LC537 PFNA_00002 | 04/01/18 | TCI America, Lot QN44F | | | (Purchased Reagent) | | Perfluorononanoic acid (PFNA) | 0.963 g/g | | |
| ...LC537-PFOA_00013 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 22.76 mL | LC537 PFOA_00003 | 0.0228 g | Perfluorooctanoic acid (PFOA) | 1.00076 mg/mL | | |
|LC537 PFOA_00003 | 10/31/23 | SIGMA ALDRICH, Lot BCBS1198V | | | (Purchased Reagent) | | Perfluorooctanoic acid (PFOA) | 0.999 g/g | | |
| ...LC537-PFOS_00008 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 44.43 mL | LC537_PFOS_00003 | 0.0488 g | Perfluorooctanesulfonic acid (PFOS) | 1.00016 mg/mL | | |
|LC537_PFOS_00003 | 04/17/19 | sigma alrich, Lot SZBE107XV | | | (Purchased Reagent) | | Perfluorooctanesulfonic acid (PFOS) | 0.9106 g/g | | |

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-34181-1

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 |
| LC537-L5_00024 | 02/04/18 | 08/14/17 | MeOH/H2O, Lot 090285 | 5 mL | LC537-HSP_00025 | 540 uL | Perfluorobutanesulfonic acid (PFBS) | 135.011 ng/mL |
| | | | | | | | Perfluoroheptanoic acid (PFHpA) | 15.0037 ng/mL |
| | | | | | | | Perfluorohexanesulfonic acid (PFHxS) | 45.0101 ng/mL |
| | | | | | | | Perfluorononanoic acid (PFNA) | 30.0053 ng/mL |
| | | | | | | | Perfluorooctanoic acid (PFOA) | 30.0251 ng/mL |
| | | | | | | | Perfluorooctanesulfonic acid (PFOS) | 60.0146 ng/mL |
| | | | | | LC537-IS_00048 | 500 uL | 13C2-PFOA | 10 ng/mL |
| | | | | | | | 13C4 PFOS | 28.68 ng/mL |
| | | | | | LC537-SU_00049 | 500 uL | 13C2 PFDA | 10 ng/mL |
| | | | | | | | 13C2 PFHxA | 10 ng/mL |
| .LC537-HSP_00025 | 02/10/18 | 08/10/17 | Methanol, Lot 141039 | 20000 uL | LC537SPIM_00023 | 277.8 uL | Perfluorobutanesulfonic acid (PFBS) | 1250.1 ng/mL |
| | | | | | | | Perfluoroheptanoic acid (PFHpA) | 138.923 ng/mL |
| | | | | | | | Perfluorohexanesulfonic acid (PFHxS) | 416.76 ng/mL |
| | | | | | | | Perfluorononanoic acid (PFNA) | 277.827 ng/mL |
| | | | | | | | Perfluorooctanoic acid (PFOA) | 278.01 ng/mL |
| | | | | | | | Perfluorooctanesulfonic acid (PFOS) | 555.691 ng/mL |
| ..LC537SPIM_00023 | 02/10/18 | 08/10/17 | Methanol, Lot 104453 | 10000 uL | LC537-PFBS_00008 | 450 uL | Perfluorobutanesulfonic acid (PFBS) | 90 ug/mL |
| | | | | | LC537-PFHpA_00015 | 100 uL | Perfluoroheptanoic acid (PFHpA) | 10.0016 ug/mL |
| | | | | | LC537-PFHxS_00010 | 150 uL | Perfluorohexanesulfonic acid (PFHxS) | 30.0043 ug/mL |
| | | | | | LC537-PFNA_00013 | 200 uL | Perfluorononanoic acid (PFNA) | 20.002 ug/mL |
| | | | | | LC537-PFOA_00013 | 200 uL | Perfluorooctanoic acid (PFOA) | 20.0151 ug/mL |
| | | | | | LC537-PFOS_00008 | 400 uL | Perfluorooctanesulfonic acid (PFOS) | 40.0066 ug/mL |
| ...LC537-PFBS_00008 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 49.6 mL | LC537_PFBS_00002 | 0.0992 g | Perfluorobutanesulfonic acid (PFBS) | 2 mg/mL |
|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.: 320-34181-1

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 BCM2579V | | (Purchased Reagent) | | Perfluoroheptanoic acid (PFHpA) | 0.99 g/g |
| ...LC537-PFHxS_00010 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 55.92 mL | LC537_PFHxS_00002 | 0.123 g | Perfluorohexanesulfonic acid (PFHxS) | 2.00029 mg/mL |
|LC537_PFHxS_00002 | 04/01/18 | | Sigma, Lot BCBL3545V | | (Purchased Reagent) | | Perfluorohexanesulfonic acid (PFHxS) | 0.9094 g/g |
| ...LC537-PFNA_00013 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 62.3 mL | LC537_PFNA_00002 | 0.0647 g | Perfluorononanoic acid (PFNA) | 1000.1 ug/mL |
|LC537 PFNA_00002 | 04/01/18 | | TCI America, Lot QN44F | | (Purchased Reagent) | | Perfluorononanoic acid (PFNA) | 0.963 g/g |
| ...LC537-PFOA_00013 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 22.76 mL | LC537_PFOA_00003 | 0.0228 g | Perfluorooctanoic acid (PFOA) | 1.00076 mg/mL |
|LC537_PFOA_00003 | 10/31/23 | | SIGMA ALDRICH, Lot BCBS1198V | | (Purchased Reagent) | | Perfluorooctanoic acid (PFOA) | 0.999 g/g |
| ...LC537-PFOS_00008 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 44.43 mL | LC537_PFOS_00003 | 0.0488 g | Perfluorooctanesulfonic acid (PFOS) | 1.00016 mg/mL |
|LC537_PFOS_00003 | 04/17/19 | | sigma alrich, Lot SZBE107XV | | (Purchased Reagent) | | Perfluorooctanesulfonic acid (PFOS) | 0.9106 g/g |
| .LC537-IS_00048 | 02/04/18 | 08/04/17 | Methanol, Lot 090285 | 30000 uL | LCM2PFOA_00007 | 60 uL | 13C2-PFOA | 0.1 ug/mL |
| ..LCM2PFOA_00007 | 02/12/21 | | Wellington Laboratories, Lot M2PFOA0216 | | LCMPFOS_00021 | 180 uL | 13C4 PFOS | 0.2868 ug/mL |
| ..LCMPFOS_00021 | 12/12/21 | | Wellington Laboratories, Lot MPFOS1216 | | (Purchased Reagent) | | 13C2-PFOA | 50 ug/mL |
| .LC537-SU_00049 | 02/04/18 | 08/04/17 | Methanol, Lot 104453 | 30000 uL | LCMPFDA_00012 | 60 uL | 13C2 PFDA | 0.1 ug/mL |
| ..LCMPFDA_00012 | 09/30/21 | | Wellington Laboratories, Lot MPFDA0916 | | LCMPFHxA_00013 | 60 uL | 13C2 PFHxA | 0.1 ug/mL |
| ..LCMPFHxA_00013 | 04/08/21 | | Wellington Laboratories, Lot MPFHxA0416 | | (Purchased Reagent) | | 13C2 PFDA | 50 ug/mL |
| LC537-L6_00020 | 02/04/18 | 08/14/17 | MeOH/H2O, Lot 090285 | 5 mL | LC537-HSP_00025 | 720 uL | Perfluorobutanesulfonic acid (PFBS) | 180.014 ng/mL |
| | | | | | | | Perfluoroheptanoic acid (PFHpA) | 20.0049 ng/mL |
| | | | | | | | Perfluorohexanesulfonic acid (PFHxS) | 60.0135 ng/mL |
| | | | | | | | Perfluorononanoic acid (PFNA) | 40.0071 ng/mL |
| | | | | | | | Perfluorooctanoic acid (PFOA) | 40.0334 ng/mL |
| | | | | | | | Perfluorooctanesulfonic acid (PFOS) | 80.0195 ng/mL |
| LC537-IS_00048 | 500 uL | 13C2-PFOA | 10 ng/mL | | | | | |
| LC537-SU_00049 | 500 uL | 13C4 PFOS | 28.68 ng/mL | | | | | |
| .LC537-HSP_00025 | 02/10/18 | 08/10/17 | Methanol, Lot 141039 | 20000 uL | LC537SPIM_00023 | 277.8 uL | 13C2 PFDA | 10 ng/mL |
| | | | | | | | 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.: 320-34181-1

SDG No.: _____

| Reagent ID | Exp Date | Prep Date | Dilutant Used | Reagent Final Volume | Parent Reagent | | Analyte | Concentration |
|-----------------------|----------|---|----------------------|----------------------|---------------------|--------------|--------------------------------------|---------------|
| | | | | | Reagent ID | Volume Added | | |
| | | | | | LC537-PFHpA_00015 | 100 uL | Perfluoroheptanoic acid (PFHpA) | 10.0016 ug/mL |
| | | | | | LC537-PFHxS_00010 | 150 uL | Perfluorohexanesulfonic acid (PFHxS) | 30.0043 ug/mL |
| | | | | | LC537-PFNA_00013 | 200 uL | Perfluorononanoic acid (PFNA) | 20.002 ug/mL |
| | | | | | LC537-PFOA_00013 | 200 uL | Perfluorooctanoic acid (PFOA) | 20.0151 ug/mL |
| | | | | | LC537-PFOS_00008 | 400 uL | Perfluorooctanesulfonic acid (PFOS) | 40.0066 ug/mL |
| ...LC537-PFBS_00008 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 49.6 mL | LC537_PFBS_00002 | 0.0992 g | Perfluorobutanesulfonic acid (PFBS) | 2 mg/mL |
|LC537_PFBS_00002 | 04/01/18 | Sigma, Lot MKBP8842V | | | (Purchased Reagent) | | Perfluorobutanesulfonic acid (PFBS) | 1 g/g |
| ...LC537-PFHpA_00015 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 48.7 mL | LC537_PFHpA_00002 | 0.0492 g | Perfluoroheptanoic acid (PFHpA) | 1.00016 mg/mL |
|LC537_PFHpA_00002 | 04/01/18 | Aldrich, Lot BCM2579V | | | (Purchased Reagent) | | Perfluoroheptanoic acid (PFHpA) | 0.99 g/g |
| ...LC537-PFHxS_00010 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 55.92 mL | LC537_PFHxS_00002 | 0.123 g | Perfluorohexanesulfonic acid (PFHxS) | 2.00029 mg/mL |
|LC537_PFHxS_00002 | 04/01/18 | Sigma, Lot BCBL3545V | | | (Purchased Reagent) | | Perfluorohexanesulfonic acid (PFHxS) | 0.9094 g/g |
| ...LC537-PFNA_00013 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 62.3 mL | LC537_PFNA_00002 | 0.0647 g | Perfluorononanoic acid (PFNA) | 1000.1 ug/mL |
|LC537_PFNA_00002 | 04/01/18 | TCI America, Lot QN44F | | | (Purchased Reagent) | | Perfluorononanoic acid (PFNA) | 0.963 g/g |
| ...LC537-PFOA_00013 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 22.76 mL | LC537_PFOA_00003 | 0.0228 g | Perfluorooctanoic acid (PFOA) | 1.00076 mg/mL |
|LC537_PFOA_00003 | 10/31/23 | SIGMA ALDRICH, Lot BCBS1198V | | | (Purchased Reagent) | | Perfluorooctanoic acid (PFOA) | 0.999 g/g |
| ...LC537-PFOS_00008 | 02/10/18 | 08/10/17 | Methanol, Lot 090285 | 44.43 mL | LC537_PFOS_00003 | 0.0488 g | Perfluorooctanesulfonic acid (PFOS) | 1.00016 mg/mL |
|LC537_PFOS_00003 | 04/17/19 | sigma alrich, Lot SZBE107XV | | | (Purchased Reagent) | | Perfluorooctanesulfonic acid (PFOS) | 0.9106 g/g |
| .LC537-IS_00048 | 02/04/18 | 08/04/17 | Methanol, Lot 090285 | 30000 uL | LCM2PFOA_00007 | 60 uL | 13C2-PFOA | 0.1 ug/mL |
| ..LCM2PFOA_00007 | 02/12/21 | Wellington Laboratories, Lot M2PFOA0216 | | | LCMPFOS_00021 | 180 uL | 13C4 PFOS | 0.2868 ug/mL |
| ..LCMPFOS_00021 | 12/12/21 | Wellington Laboratories, Lot MPFOS1216 | | | (Purchased Reagent) | | 13C2-PFOA | 50 ug/mL |
| .LC537-SU_00049 | 02/04/18 | 08/04/17 | Methanol, Lot 104453 | 30000 uL | LCMPFDA_00012 | 60 uL | 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_00056 | 05/27/18 | 11/27/17 | Methanol, Lot 104453 | 30000 uL | LCMPFDA_00012 | 60 uL | 13C2 PFDA | 0.1 ug/mL |
| .LCMPFDA_00012 | 09/30/21 | Wellington Laboratories, Lot MPFDA0916 | | | LCMPFHxA_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

LC537_PFB_00002

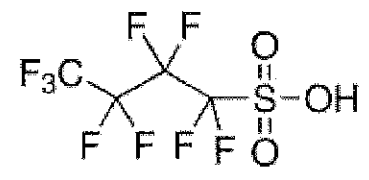
#: 4/1/15 SPV

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

Certificate of Analysis

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

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



PFBS

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

Jamie Gleason

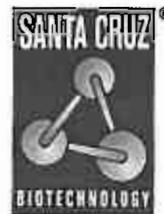
Jamie Gleason, Manager
Quality Control
Milwaukee, Wisconsin US

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Reagent

LC537_PFB2_00002

F: 6.8.17 SW



CERTIFICATE OF ANALYSIS

The Power to Question

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

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

Reagent

LC537_PFHpA_00002

R: 4/1/15 4V

Certificate of Analysis

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

PFHpA

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

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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Reagent

LC537_PFHpA2_00002

Certificate of analysis

r:6.13.17 SW

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

PFHe A

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

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ThermoFisher
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Reagent

LC537_PFHxS_00002

r: 4/1/15 stw

Certificate of Analysis

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

Product Number: 50929

Batch Number: BCBL3545V

Brand: Aldrich

CAS Number: 3871-99-6

Formula: C₆F₁₃KO₃S

Formula Weight: 438.20

Quality Release Date: 20 JUN 2013

PFH₁₃S-K

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

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

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

stw 4/1/15

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Reagent

LC537_PFHxS2_00002

n: 6-8-17 SKJ

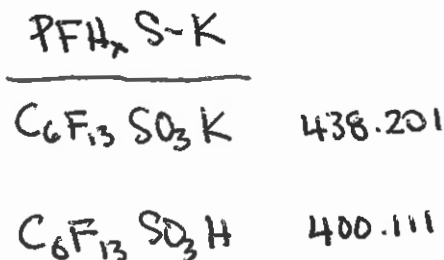


The Future of Science

CERTIFICATE OF ANALYSIS

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

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



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

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

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

Reagent

LC537_PENA_00002

R: 4/1/15 SKV



Certificate of Analysis

Apr 2, 2015 (JST)

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

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

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

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

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

PFNA

Reagent

LC537_PFN2_00002

P: 6.14.17 SKW

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: www.sigmaaldrich.com

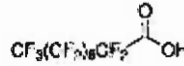
Email USA: techserv@sial.com

Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name:
Perfluorononanoic acid - 97%

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



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

Michael Grady, Manager
Quality Control
Milwaukee, WI US

PFNA

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

Reagent

LC537_PFOA_00003

R: 11/30/16 SKV
PFA

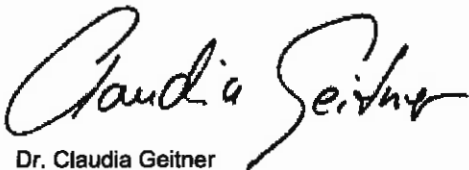
SIGMA-ALDRICH

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

Certificate of Analysis

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

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



Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

Reagent

LC537_PFOA2_00002

Certificate of analysis

P: 6/21/17 SW

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

PFOA

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

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Reagent

LC537_PFOs_00003

n: 11/30/16 SV
PFOS

SIGMA-ALDRICH

CERTIFICATE OF ANALYSIS

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

Seelze, 22.04.2014/524107/14/08646

Order-No.:

Customer-No.:

Order-Code:

Quantity:

Production Date: 17.Apr.2014

Expiry Date: 17.Apr.2019

Article/Product: 33829

Batch : SZBE107XV

Heptadecafluorooctanesulfonic acid potassium salt OEKANAL[®]

Reference Material (RM)

1. General Information

Formula: C₈F₁₇KO₃S

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

Usage : PFOS

Molar mass: 538.22 g/Mole

Recomm. storage temp.: roomtemp.

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

2. Batch Analysis

Identity

Assay (LC-MS)

Date of Analysis

complying

98 %

22.Apr.2014

3. Advice and Remarks

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

Sigma-Aldrich Laborchemikalien GmbH
Quality Management SA-LC

Reagent

LC537_PFOs2_00002

R: 6.14.17 SKV

Certificate of Analysis

Product Name: HEPTADECAFLUOROOCCTANESULFONIC ACID TETRAETHYLAMMONIUM SALT
98 %

Product Number: 365289

Batch Number: BCBQ0108V

Brand: Aldrich

CAS Number: 56773-42-3

Formula: $CF_3(CF_2)_6CF_2SO_3N(C_2H_5)_4$

Formula Weight: 629.37

Quality Release Date: 11 JUN 2015

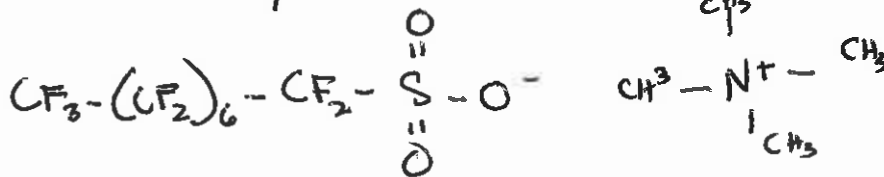
| TEST | SPECIFICATION | RESULT |
|--------------------|--------------------------------|-----------|
| APPEARANCE (COLOR) | WHITE TO OFF WHITE | OFF-WHITE |
| APPEARANCE (FORM) | POWDER OR POWDER WITH CHUNK(S) | POWDER |
| CARBON CONTENT | 29.77 % - 31.29 % | 29.97 % |
| INFRARED SPECTRUM | CONFORMS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

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

Purity & MW correction = 77.37%



| | | |
|------------|-----------------------|----------------|
| | $C_8 F_{17} SO_3^+ H$ | $C_8 H_{20} N$ |
| C = 12.011 | 96.088 | 96.088 |
| F = 18.998 | 322.966 | — |
| S = 32.066 | 32.066 | — |
| O = 16.000 | 47.997 | 20.60 |
| H = 1.008 | 1.008 | 14.007 |
| N = 14.007 | — | — |
| | <hr/> | <hr/> |
| | 500.125 | 130.255 |

Reagent

LCM2PFOA_00007

P: 5/11/17 SKV



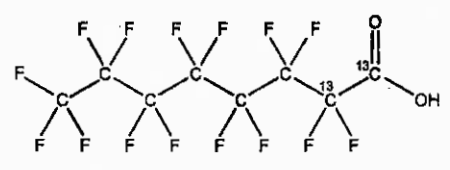
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: M2PFOA0216

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₆HF₁₆O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 416.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/12/2016
EXPIRY DATE: (mm/dd/yyyy) 02/12/2021

ISOTOPIC PURITY: ≥99%¹³C
(1,2-¹³C₂)

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:
B.G. Chittim

Date: 02/24/2016
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

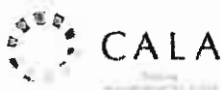
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

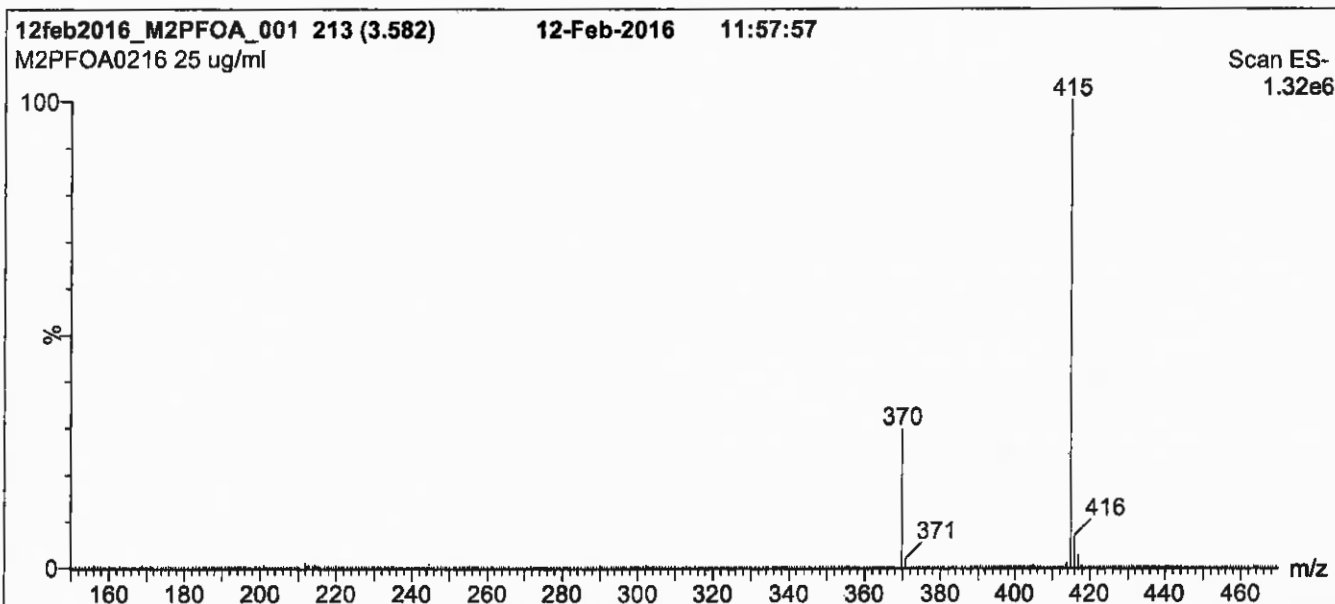
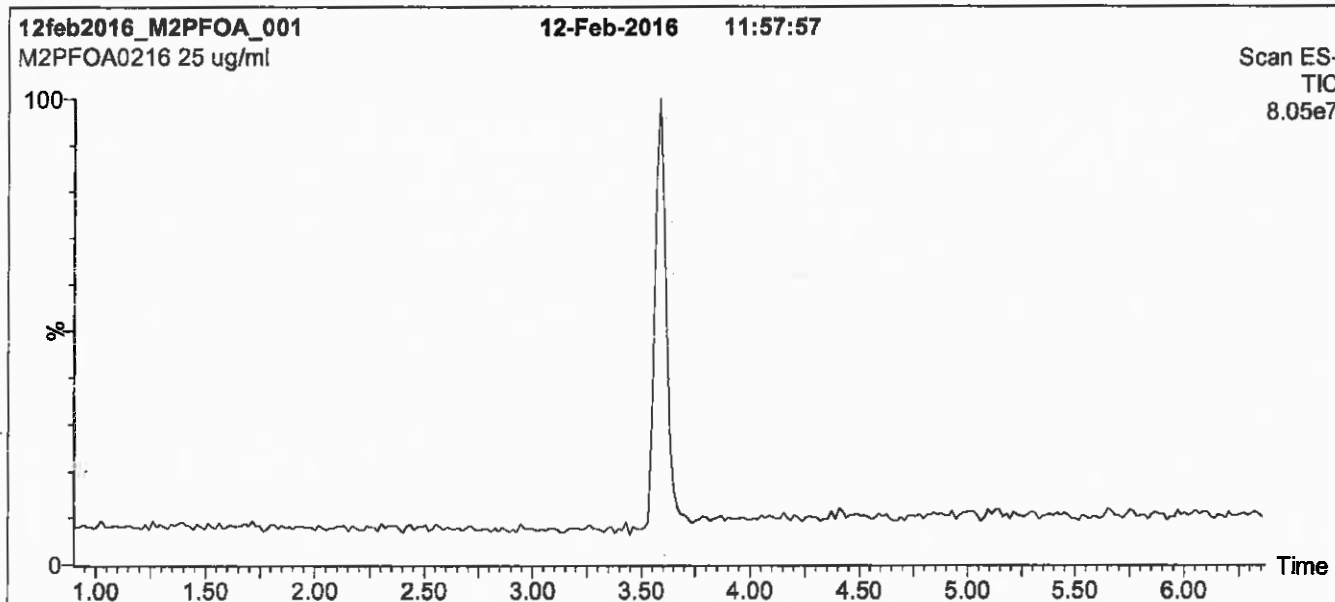
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

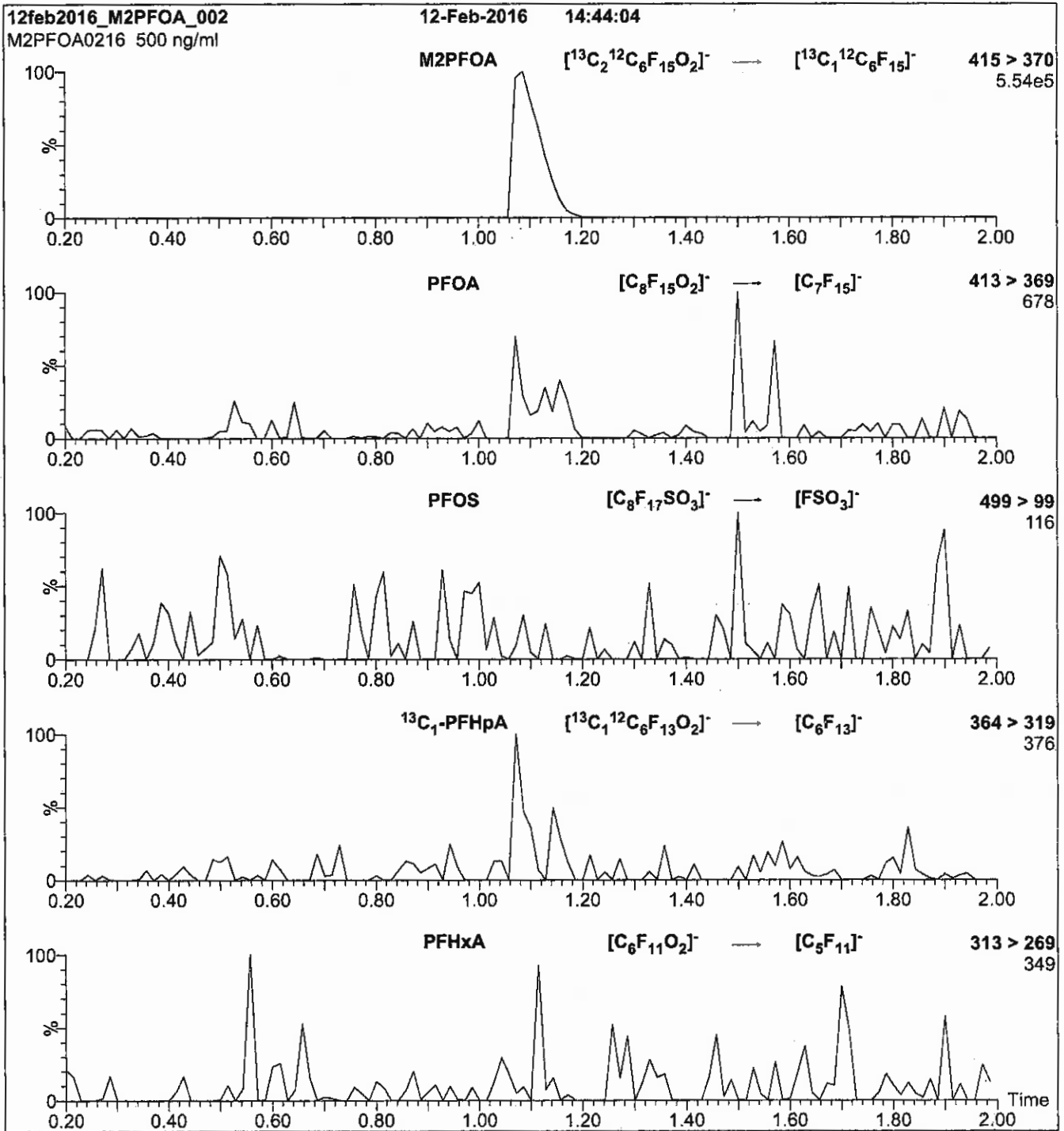
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)
Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: M2PFOA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
 10 μl (500 ng/ml M2PFOA)

Mobile phase: Isocratic 80% MeOH / 20% H₂O

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

MS Parameters

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

Reagent

LCMPFDA_00012

R: SBC 12/21/16



814255

ID: LCMPPFDA_00012

Exp: 09/30/21 Prpd: SBC

13C2-Perfluorodecanoic a



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE: **CAS #:** Not available



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

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

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

LAST TESTED: (mm/dd/yyyy) 09/30/2016

EXPIRY DATE: (mm/dd/yyyy) 09/30/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:
B.G. Chríttim

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

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:

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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:

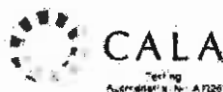
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

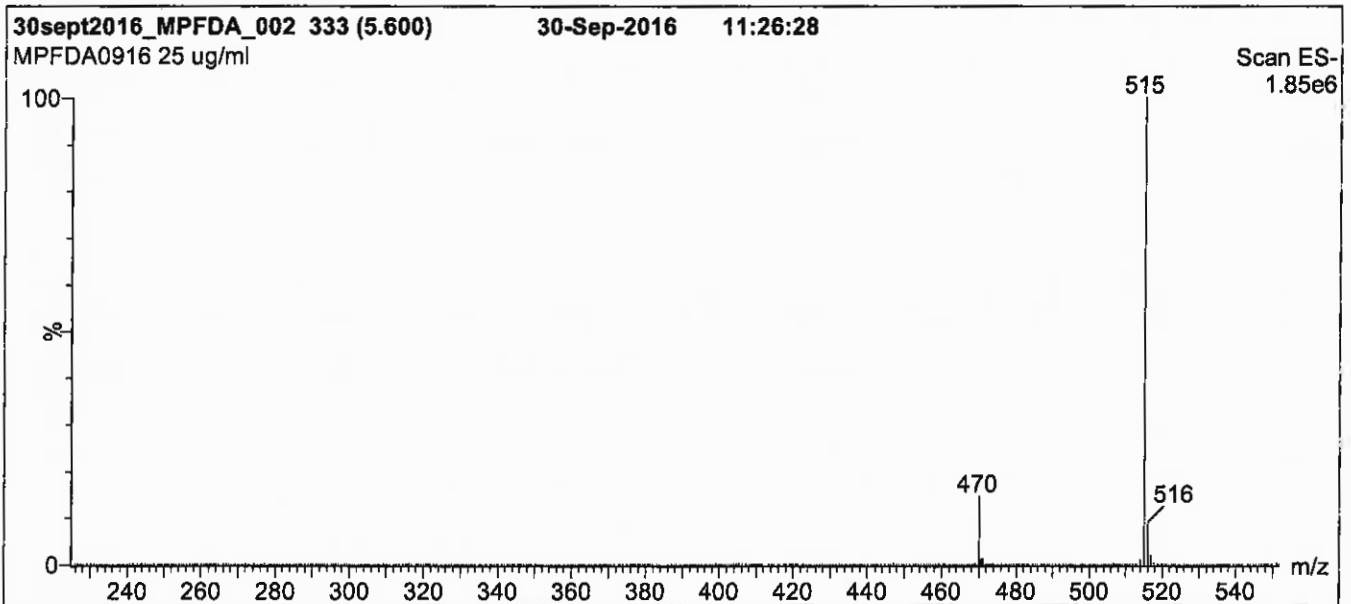
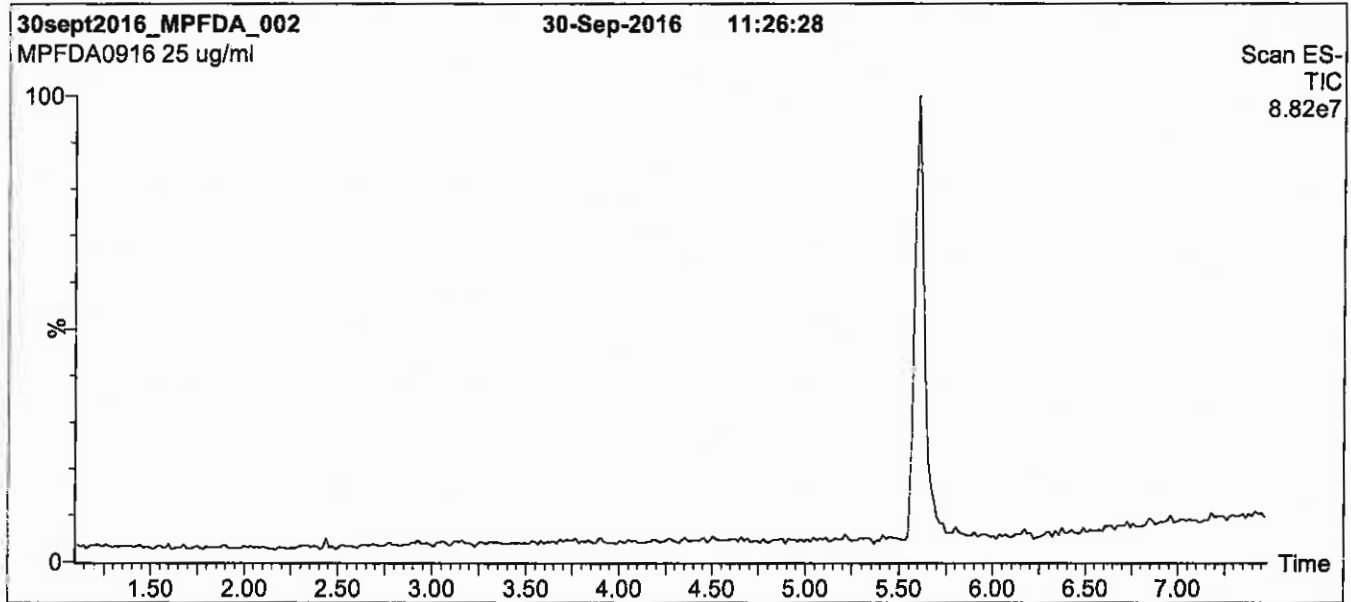
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

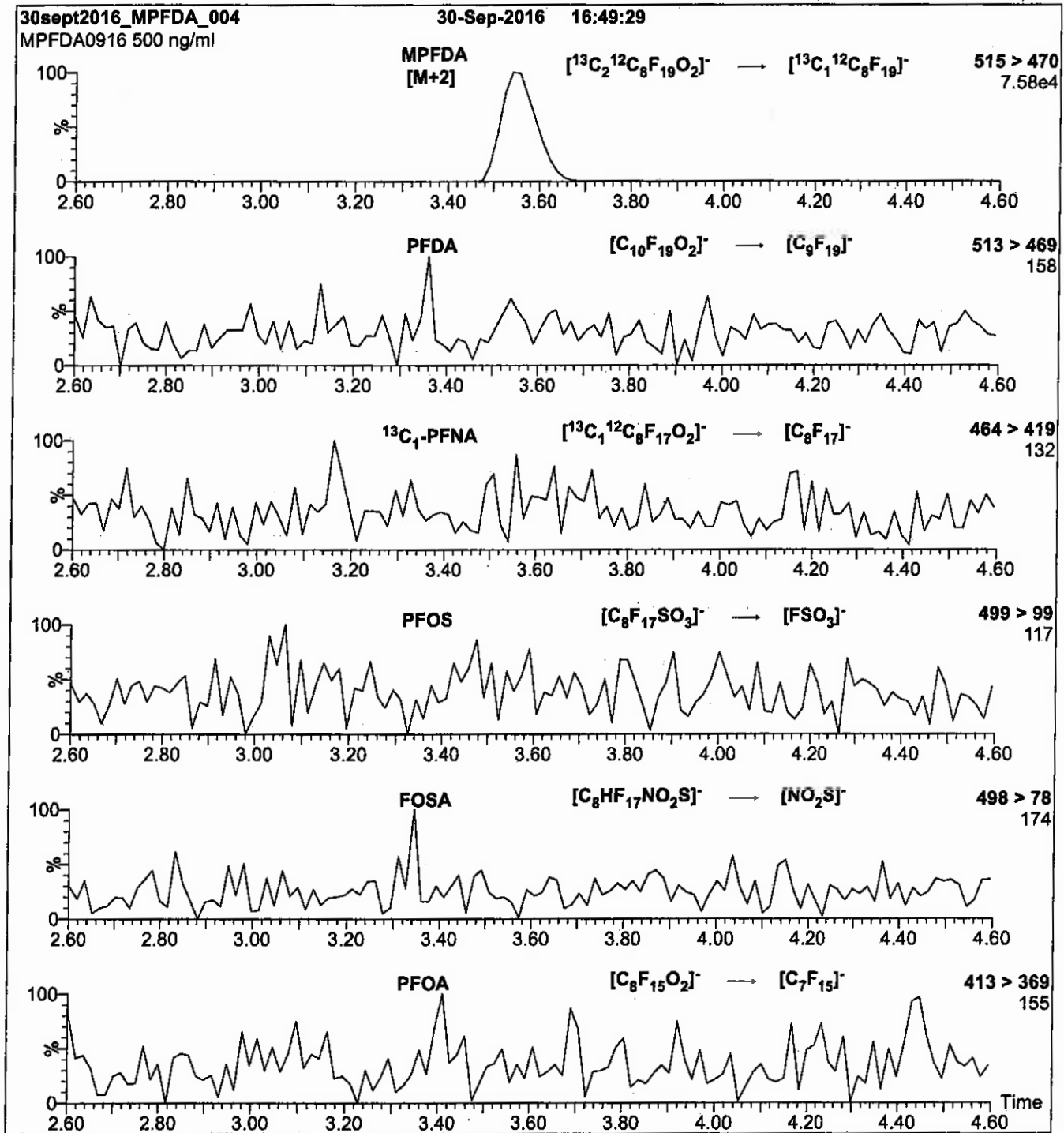
Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFHxA_00013

R: SBC 12/21/16



814258
ID: LCMPFHxA_00013
Exp: 04/08/21 Prgd: SBC
13C2-Perfluorohexanoic ac



WELLINGTON LABORATORIES

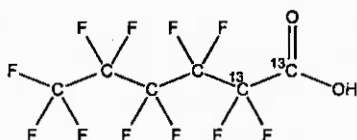
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFHxA0416

STRUCTURE:

CAS #: Not available



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

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/08/2016

ISOTOPIC PURITY: ≥99%¹³C
(1,2-¹³C₂)

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)
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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.

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Certified By:
B.G. Chittim

Date: 04/29/2016
(mm/dd/yyyy)

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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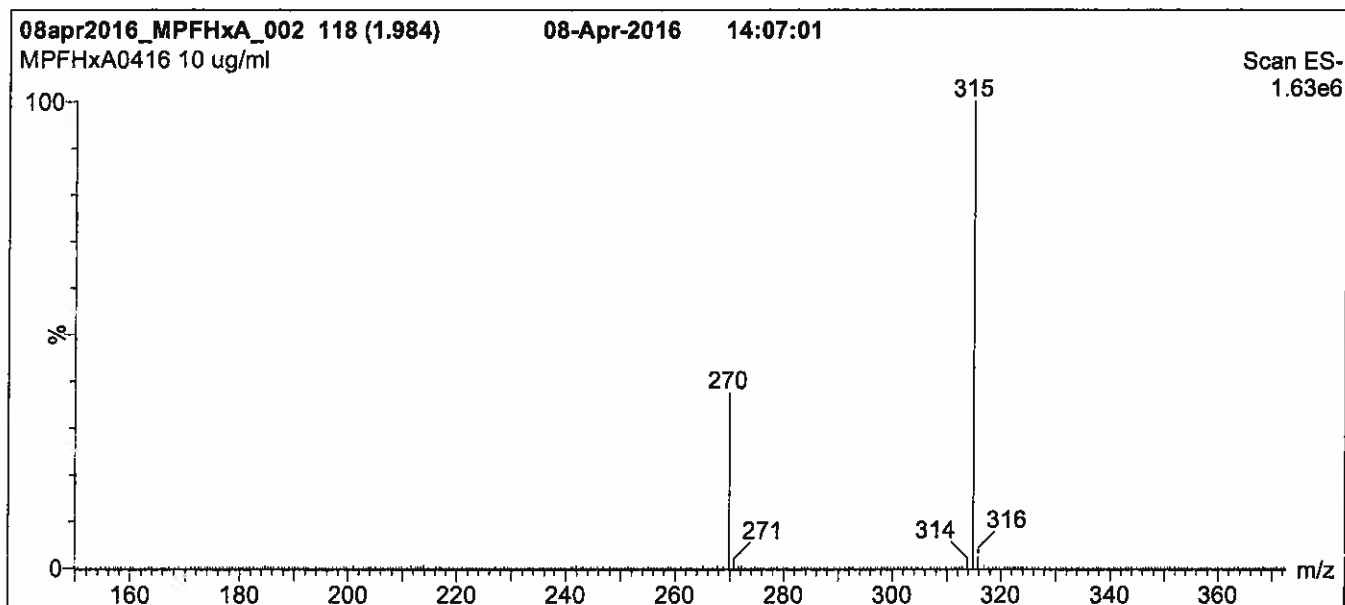
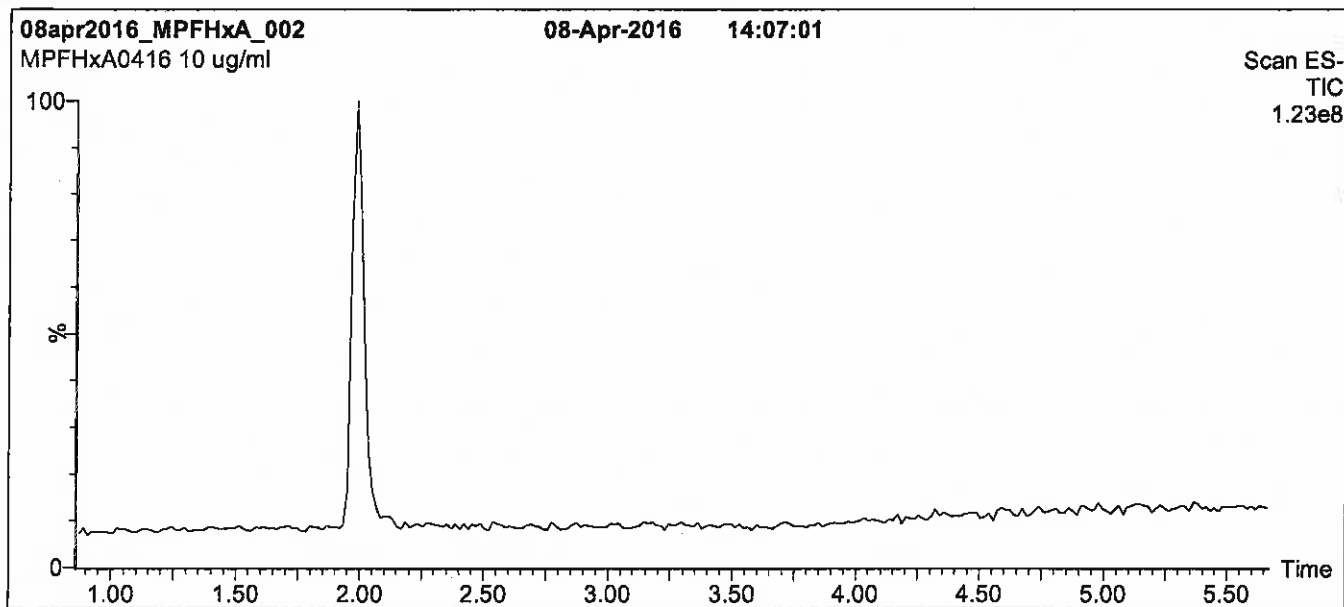
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

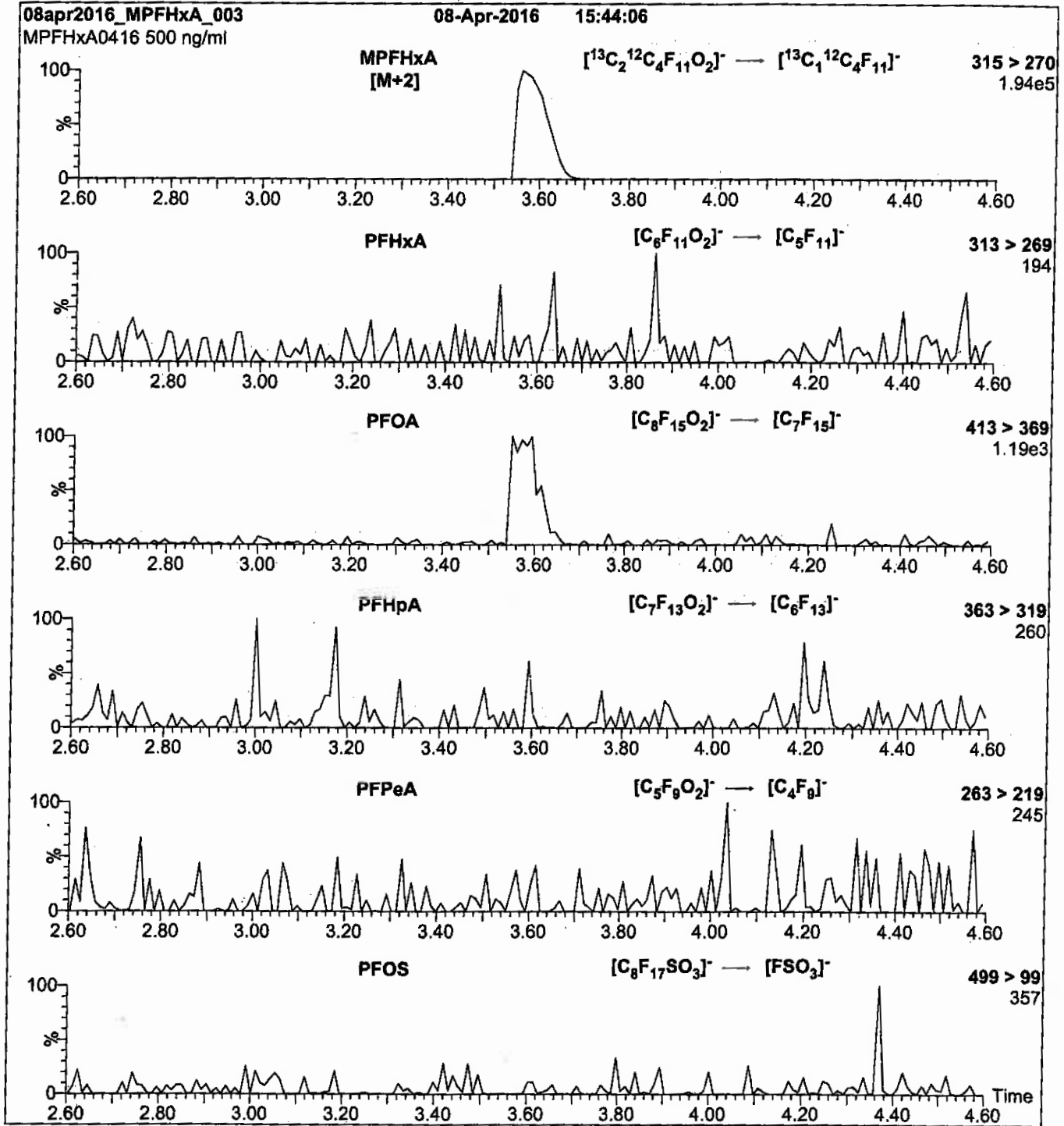
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFHxA_00015

r: 5/10/17 skd



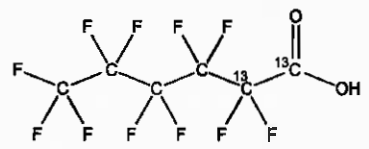
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFHxA1116

STRUCTURE: **CAS #:** Not available



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

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

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

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

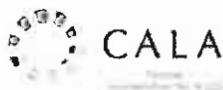
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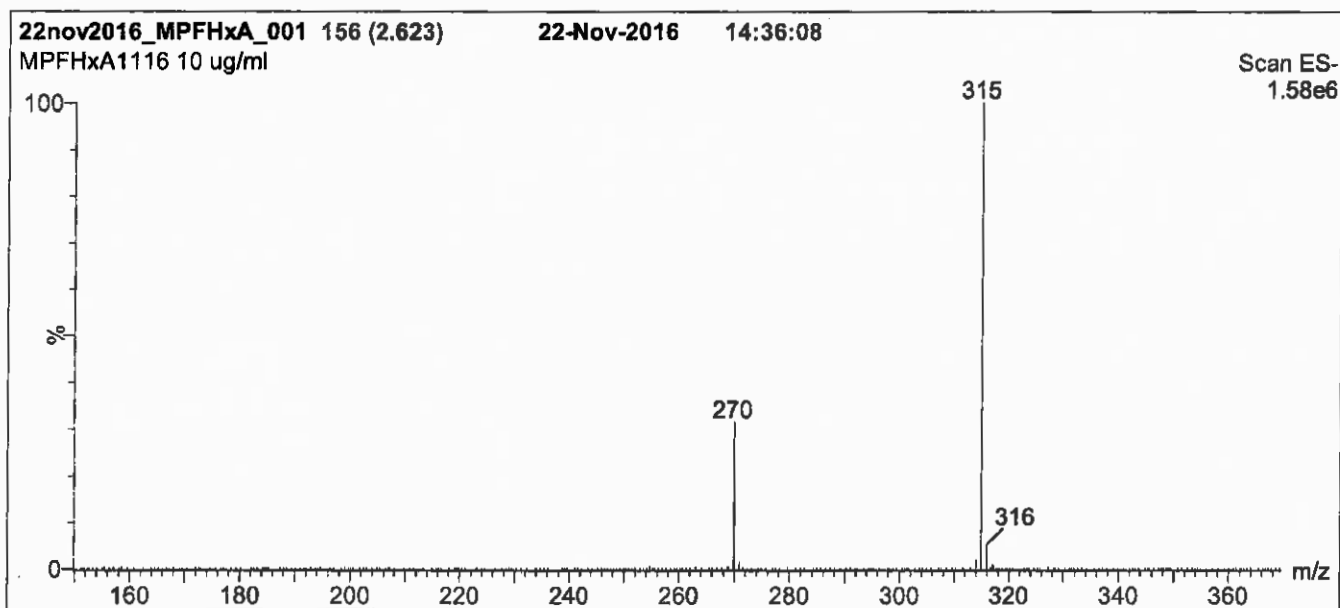
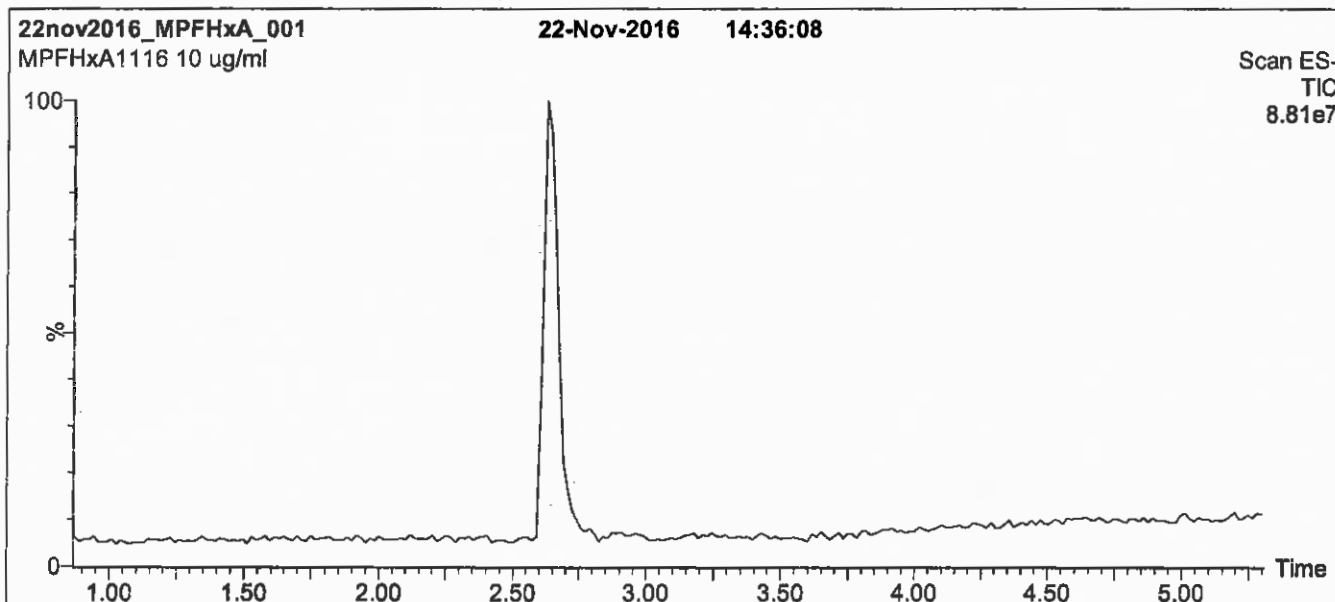
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Figure 1: MPFHxA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

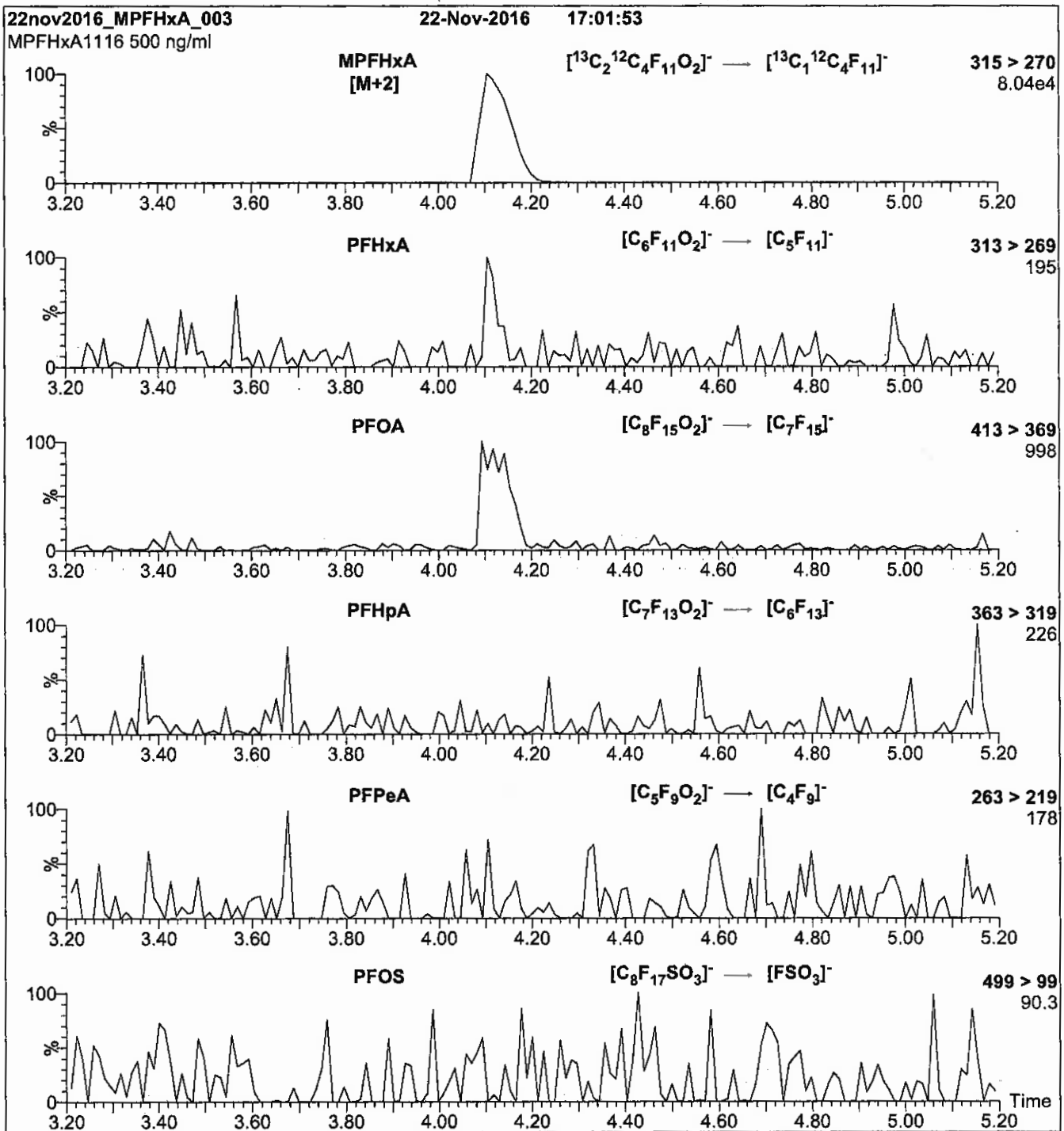
Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm
 Mobile phase: Gradient
 Start: 40% (80:20 MeOH:ACN) / 60% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 2 min
 before returning to initial conditions over 0.5 min.
 Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)
 Source: Electrospray (negative)
 Capillary Voltage (kV) = 2.00
 Cone Voltage (V) = 15.00
 Cone Gas Flow (l/hr) = 100
 Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = $3.46\text{e-}3$
 Collision Energy (eV) = 10

Reagent

LCMPFOS_00019

R: SBC 12/21/16



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

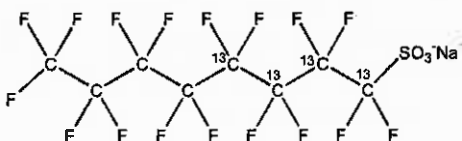


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE: **CAS #:** Not available



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


DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

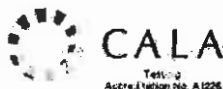
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

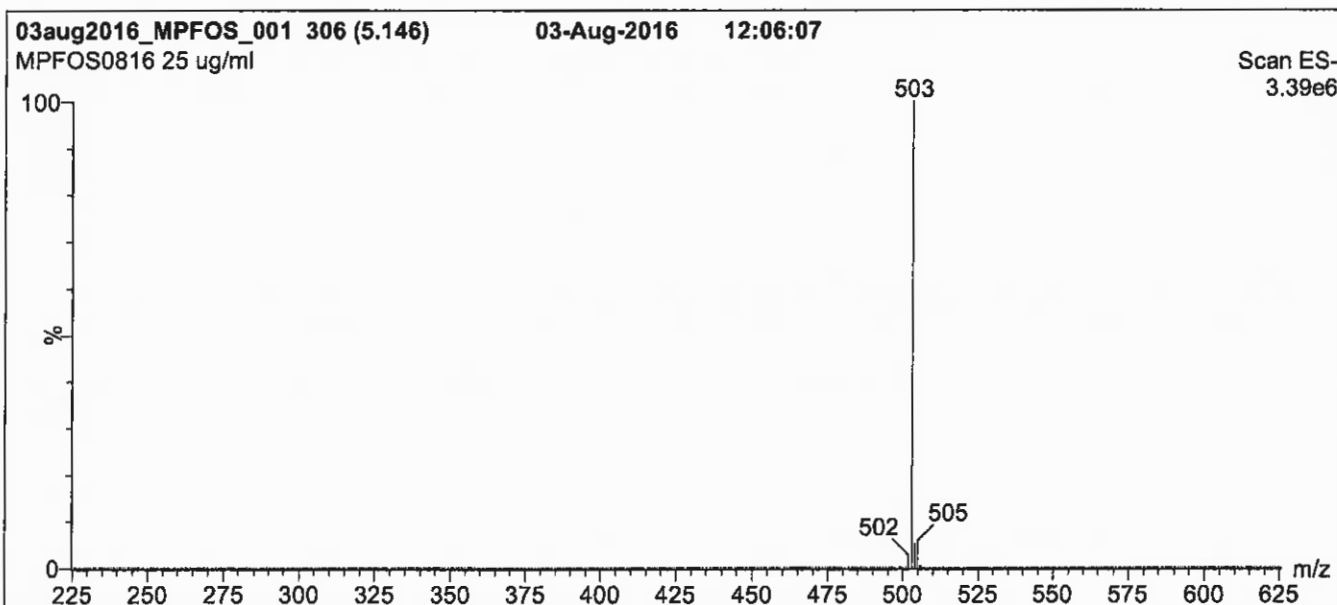
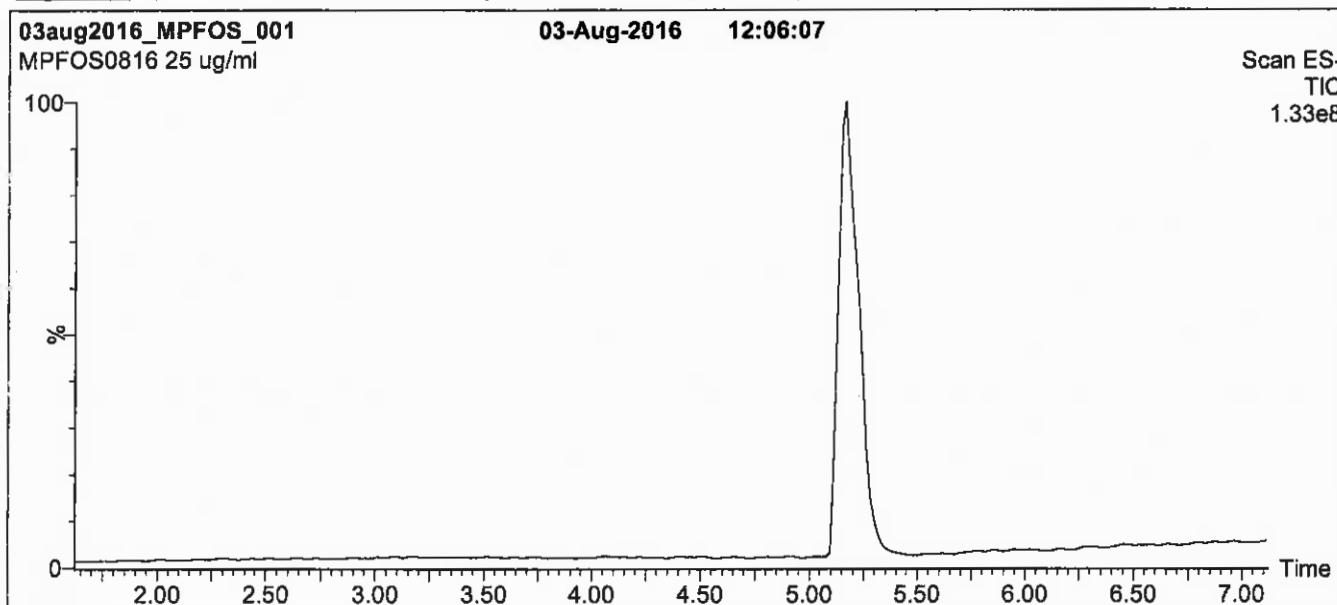
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

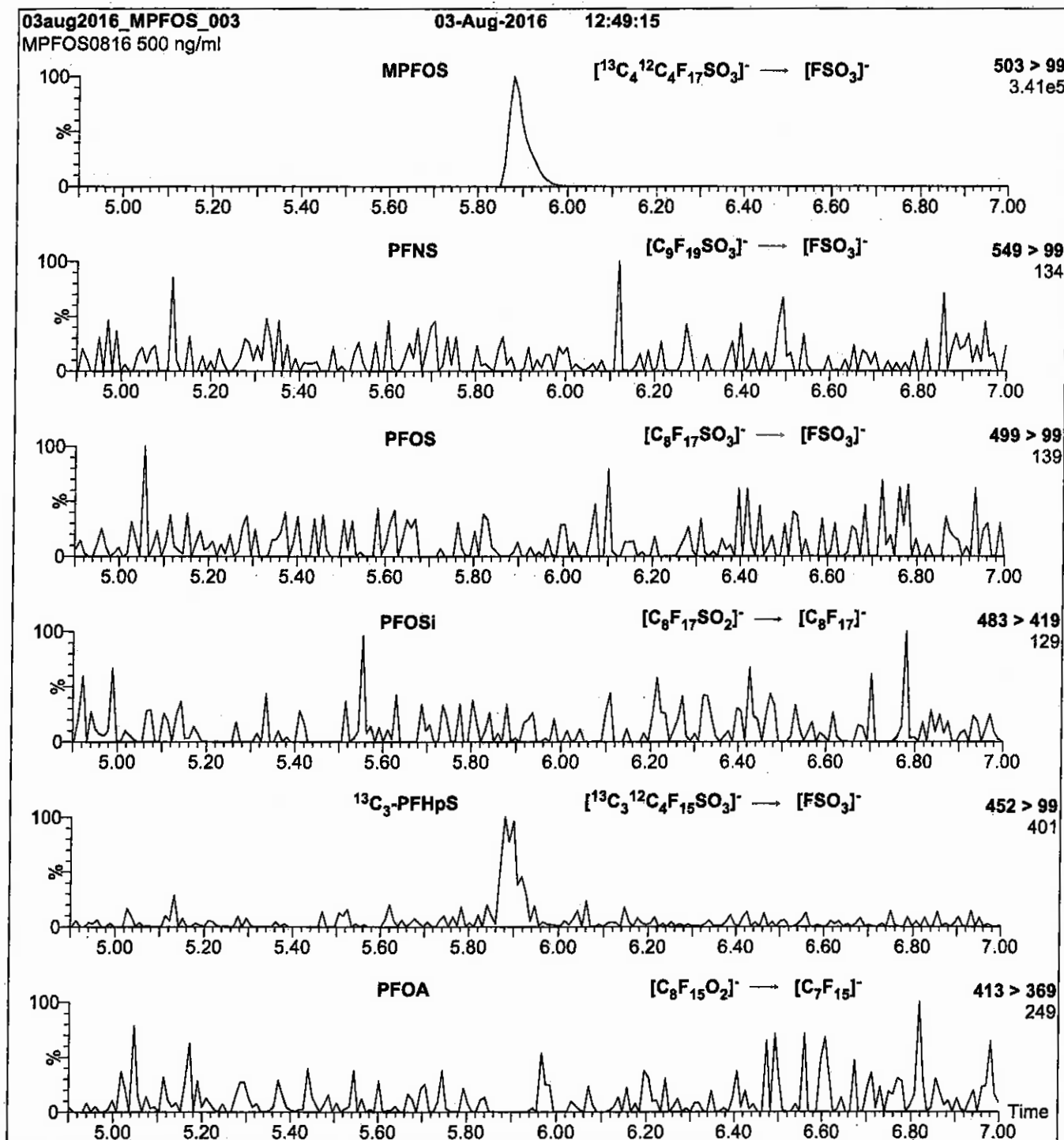
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCMPFOS_00021

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.

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EXPIRY DATE / PERIOD OF VALIDITY:

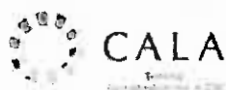
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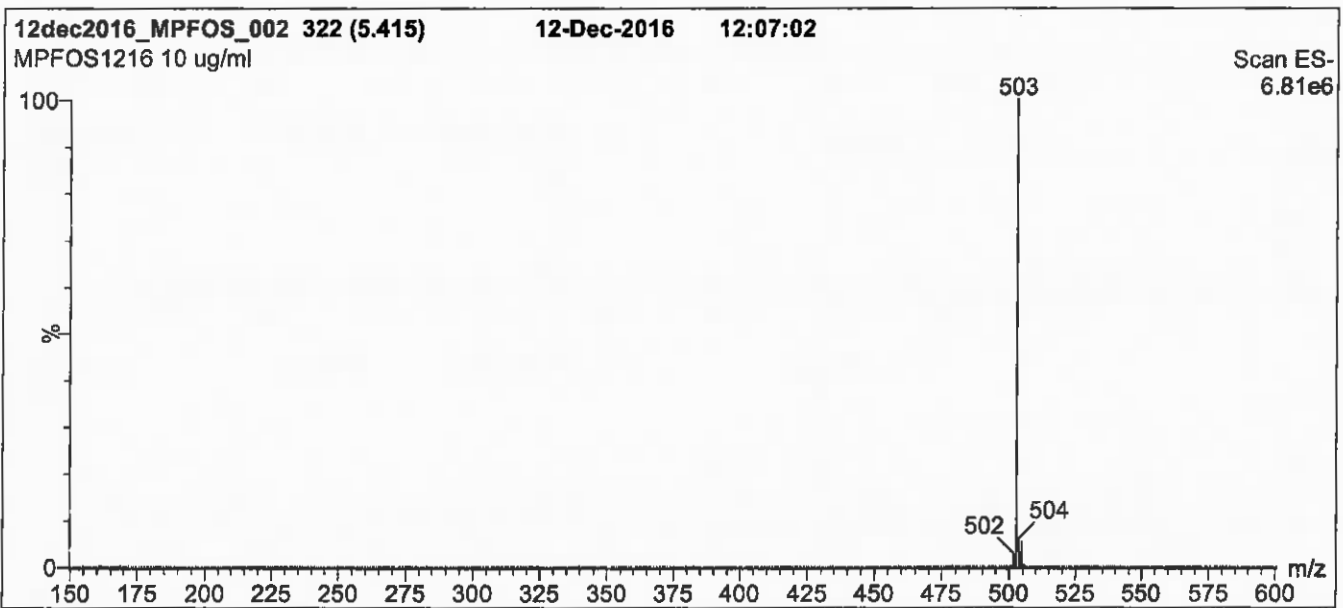
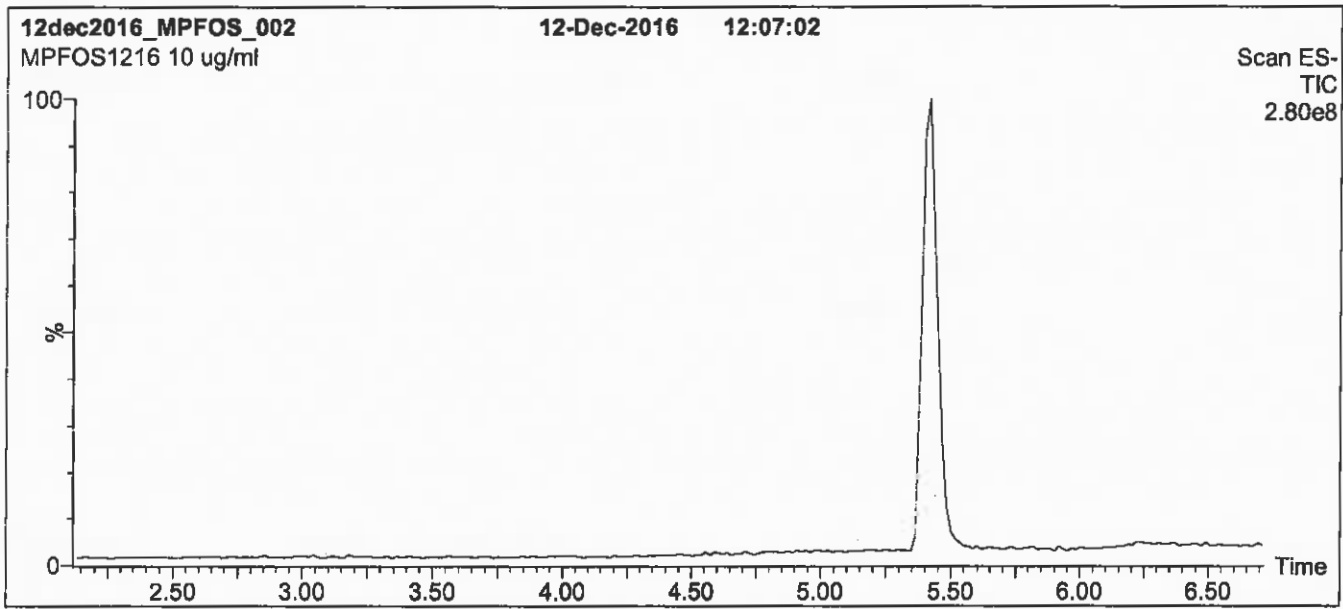
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

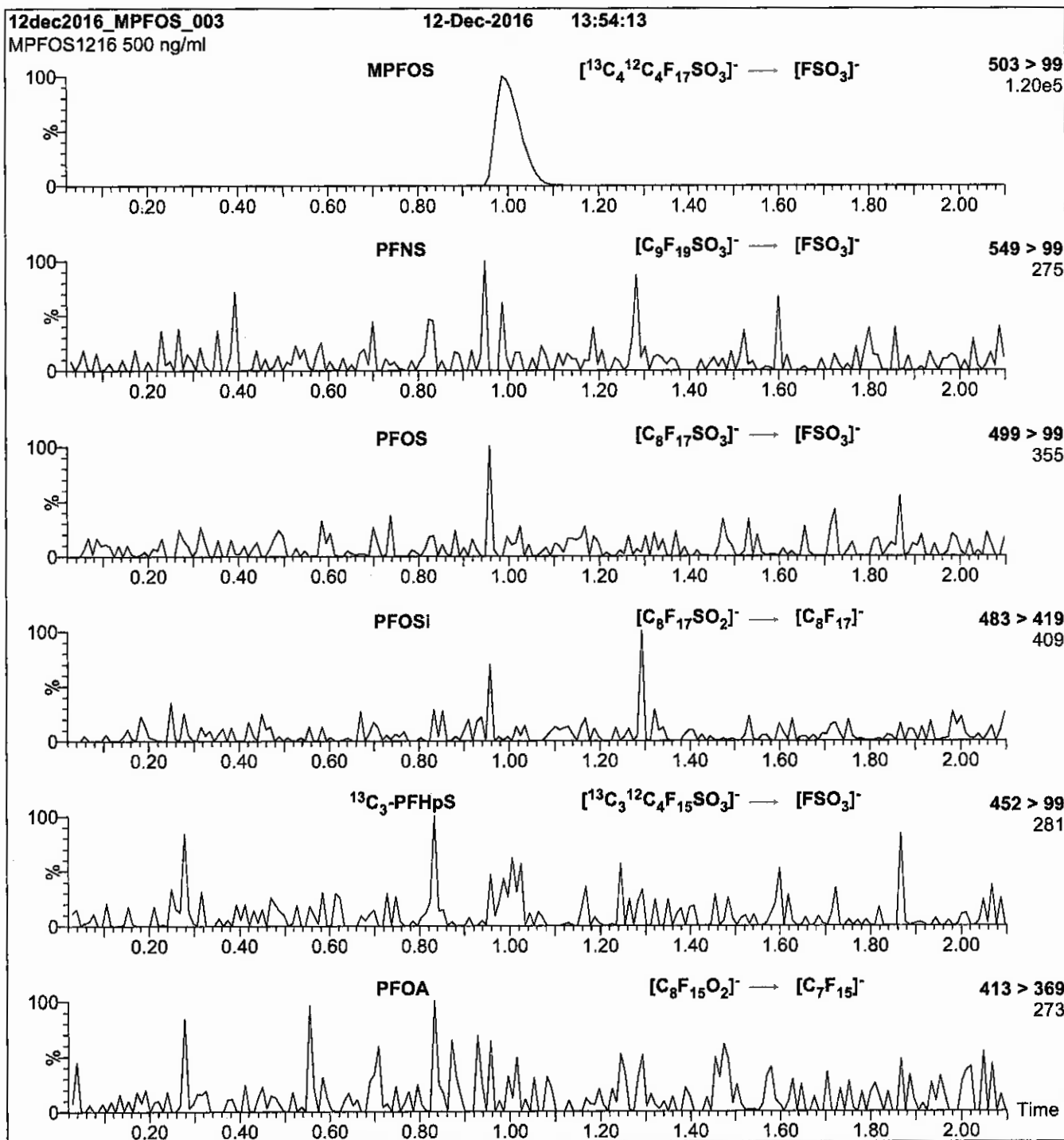
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Method 537 DOD

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

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-34181-1

SDG No.: _____

Matrix: Water

Level: Low

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

| Client Sample ID | Lab Sample ID | PFHxA # | PFDA # |
|----------------------|------------------------|---------|--------|
| WGNA-121117-RW-0488 | 320-34181-1 | 98 | 100 |
| WGNA-121117-FRB-0488 | 320-34181-2 | 92 | 89 |
| NAWC-121117-RW-136 | 320-34181-3 | 85 | 87 |
| NAWC-121117-FRB-136 | 320-34181-4 | 99 | 95 |
| NAWC-121117-RW-040 | 320-34181-5 | 90 | 97 |
| NAWC-121117-FRB-040 | 320-34181-6 | 92 | 98 |
| WGNA-121117-RW-4846 | 320-34181-7 | 88 | 87 |
| WGNA-121117-FRB-4846 | 320-34181-8 | 91 | 98 |
| WGNA-121117-DUP14 | 320-34181-9 | 96 | 90 |
| | MB 320-199900/1-A | 93 | 96 |
| | LCS 320-199900/2-A | 97 | 98 |
| | LCSD 320-199900/3-A | 97 | 103 |

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.: 320-34181-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.12.19_537A_053.d
 Lab ID: LCS 320-199900/2-A Client ID: _____

| COMPOUND | SPIKE ADDED (ng/L) | LCS CONCENTRATION (ng/L) | LCS % REC | QC LIMITS REC | # |
|---|--------------------------|--------------------------------|-----------------|---------------------|---|
| Perfluorooctanesulfonic acid (PFOS) | 222 | 223 | 100 | 70-130 | M |
| Perfluorooctanoic acid (PFOA) | 111 | 110 | 99 | 70-130 | |
| Perfluorononanoic acid (PFNA) | 111 | 109 | 98 | 70-130 | |
| Perfluorohexanesulfonic acid (PFHxS) | 167 | 183 | 110 | 70-130 | |
| Perfluoroheptanoic acid (PFHpA) | 55.6 | 62.1 | 112 | 70-130 | |
| Perfluorobutanesulfonic acid (PFBS) | 500 | 494 | 99 | 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.: 320-34181-1

SDG No.: _____

Matrix: Water Level: Low Lab File ID: 2017.12.19_537A_054.d

Lab ID: LCSD 320-199900/3-A Client ID: _____

| COMPOUND | SPIKE ADDED (ng/L) | LCSD CONCENTRATION (ng/L) | LCSD % REC | % RPD | QC LIMITS | | # |
|---|--------------------------|---------------------------------|------------------|----------|-----------|--------|---|
| | | | | | RPD | REC | |
| Perfluorooctanesulfonic acid (PFOS) | 222 | 216 | 97 | 3 | 30 | 70-130 | M |
| Perfluorooctanoic acid (PFOA) | 111 | 109 | 98 | 1 | 30 | 70-130 | |
| Perfluorononanoic acid (PFNA) | 111 | 106 | 95 | 3 | 30 | 70-130 | |
| Perfluorohexanesulfonic acid (PFHxS) | 167 | 174 | 104 | 5 | 30 | 70-130 | |
| Perfluoroheptanoic acid (PFHpA) | 55.6 | 60.0 | 108 | 3 | 30 | 70-130 | |
| Perfluorobutanesulfonic acid (PFBS) | 500 | 480 | 96 | 3 | 30 | 70-130 | |

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Lab File ID: 2017.12.19_537A_052.d Lab Sample ID: MB 320-199900/1-A
 Matrix: Water Date Extracted: 12/14/2017 12:48
 Instrument ID: A8_N Date Analyzed: 12/19/2017 20:40
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

| CLIENT SAMPLE ID | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED |
|----------------------|---------------------|-----------------------|------------------|
| | LCS 320-199900/2-A | 2017.12.19_537A_053.d | 12/19/2017 20:45 |
| | LCSD 320-199900/3-A | 2017.12.19_537A_054.d | 12/19/2017 20:49 |
| WGNA-121117-RW-0488 | 320-34181-1 | 2017.12.19_537A_055.d | 12/19/2017 20:54 |
| WGNA-121117-FRB-0488 | 320-34181-2 | 2017.12.19_537A_056.d | 12/19/2017 20:59 |
| NAWC-121117-RW-136 | 320-34181-3 | 2017.12.19_537A_057.d | 12/19/2017 21:03 |
| NAWC-121117-FRB-136 | 320-34181-4 | 2017.12.19_537A_058.d | 12/19/2017 21:08 |
| NAWC-121117-RW-040 | 320-34181-5 | 2017.12.19_537A_059.d | 12/19/2017 21:13 |
| NAWC-121117-FRB-040 | 320-34181-6 | 2017.12.19_537A_060.d | 12/19/2017 21:17 |
| WGNA-121117-RW-4846 | 320-34181-7 | 2017.12.19_537A_061.d | 12/19/2017 21:22 |
| WGNA-121117-FRB-4846 | 320-34181-8 | 2017.12.19_537A_064.d | 12/19/2017 21:36 |
| WGNA-121117-DUP14 | 320-34181-9 | 2017.12.19_537A_065.d | 12/19/2017 21:41 |

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 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 | | |
| CCV 320-200646/1 CCVIS | 1495978 | 1.81 | 3096651 | 2.06 | | |
| MB 320-199900/1-A | 1460001 | 1.81 | 3186036 | 2.07 | | |
| LCS 320-199900/2-A | 1457783 | 1.81 | 3055078 | 2.07 | | |
| LCSD 320-199900/3-A | 1467291 | 1.81 | 3102295 | 2.07 | | |
| 320-34181-1 | WGNA-121117-RW-0488 | 1456980 | 1.81 | 3037745 | 2.06 | |
| 320-34181-2 | WGNA-121117-FRB-0488 | 1544196 | 1.81 | 3255698 | 2.06 | |
| 320-34181-3 | NAWC-121117-RW-136 | 1574402 | 1.81 | 3341880 | 2.06 | |
| 320-34181-4 | NAWC-121117-FRB-136 | 1478101 | 1.81 | 3156769 | 2.06 | |
| 320-34181-5 | NAWC-121117-RW-040 | 1556701 | 1.81 | 3369191 | 2.07 | |
| 320-34181-6 | NAWC-121117-FRB-040 | 1531447 | 1.81 | 3175241 | 2.06 | |
| 320-34181-7 | WGNA-121117-RW-4846 | 1486642 | 1.81 | 3153123 | 2.07 | |
| CCV 320-200646/13 CCVIS | 1490421 | 1.81 | 3162377 | 2.06 | | |
| CCV 320-200767/13 CCVIS | 1490421 | 1.81 | 3162377 | 2.06 | | |
| 320-34181-8 | WGNA-121117-FRB-4846 | 1519488 | 1.81 | 3290304 | 2.07 | |
| 320-34181-9 | WGNA-121117-DUP14 | 1565140 | 1.81 | 3193781 | 2.06 | |
| CCV 320-200767/21 CCVIS | 1464558 | 1.81 | 3048007 | 2.07 | | |

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Sample No.: CCV 320-200646/1 Date Analyzed: 12/19/2017 20:31
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.19_537A_050 Heated Purge: (Y/N) N
 Calibration ID: 36012

| | 13PFOA | | PFOS | | AREA # | RT # |
|---------------------|----------------------|---------|---------|---------|--------|------|
| | AREA # | RT # | AREA # | RT # | | |
| 12/24 HOUR STD | 1495978 | 1.81 | 3096651 | 2.06 | | |
| UPPER LIMIT | 2094369 | 2.31 | 4335311 | 2.56 | | |
| LOWER LIMIT | 1047185 | 1.31 | 2167656 | 1.56 | | |
| LAB SAMPLE ID | CLIENT SAMPLE ID | | | | | |
| MB 320-199900/1-A | | 1460001 | 1.81 | 3186036 | 2.07 | |
| LCS 320-199900/2-A | | 1457783 | 1.81 | 3055078 | 2.07 | |
| LCSD 320-199900/3-A | | 1467291 | 1.81 | 3102295 | 2.07 | |
| 320-34181-1 | WGNA-121117-RW-0488 | 1456980 | 1.81 | 3037745 | 2.06 | |
| 320-34181-2 | WGNA-121117-FRB-0488 | 1544196 | 1.81 | 3255698 | 2.06 | |
| 320-34181-3 | NAWC-121117-RW-136 | 1574402 | 1.81 | 3341880 | 2.06 | |
| 320-34181-4 | NAWC-121117-FRB-136 | 1478101 | 1.81 | 3156769 | 2.06 | |
| 320-34181-5 | NAWC-121117-RW-040 | 1556701 | 1.81 | 3369191 | 2.07 | |
| 320-34181-6 | NAWC-121117-FRB-040 | 1531447 | 1.81 | 3175241 | 2.06 | |
| 320-34181-7 | WGNA-121117-RW-4846 | 1486642 | 1.81 | 3153123 | 2.07 | |

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Sample No.: CCV 320-200646/13 Date Analyzed: 12/19/2017 21:27
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.19_537A_062 Heated Purge: (Y/N) N
 Calibration ID: 36012

| | 13PFOA | | PFOS | | AREA # | RT # |
|---------------------|----------------------|---------|---------|---------|--------|------|
| | AREA # | RT # | AREA # | RT # | | |
| 12/24 HOUR STD | 1490421 | 1.81 | 3162377 | 2.06 | | |
| UPPER LIMIT | 2086589 | 2.31 | 4427328 | 2.56 | | |
| LOWER LIMIT | 1043295 | 1.31 | 2213664 | 1.56 | | |
| LAB SAMPLE ID | CLIENT SAMPLE ID | | | | | |
| MB 320-199900/1-A | | 1460001 | 1.81 | 3186036 | 2.07 | |
| LCS 320-199900/2-A | | 1457783 | 1.81 | 3055078 | 2.07 | |
| LCSD 320-199900/3-A | | 1467291 | 1.81 | 3102295 | 2.07 | |
| 320-34181-1 | WGNA-121117-RW-0488 | 1456980 | 1.81 | 3037745 | 2.06 | |
| 320-34181-2 | WGNA-121117-FRB-0488 | 1544196 | 1.81 | 3255698 | 2.06 | |
| 320-34181-3 | NAWC-121117-RW-136 | 1574402 | 1.81 | 3341880 | 2.06 | |
| 320-34181-4 | NAWC-121117-FRB-136 | 1478101 | 1.81 | 3156769 | 2.06 | |
| 320-34181-5 | NAWC-121117-RW-040 | 1556701 | 1.81 | 3369191 | 2.07 | |
| 320-34181-6 | NAWC-121117-FRB-040 | 1531447 | 1.81 | 3175241 | 2.06 | |
| 320-34181-7 | WGNA-121117-RW-4846 | 1486642 | 1.81 | 3153123 | 2.07 | |

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

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

RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Sample No.: CCV 320-200767/13 Date Analyzed: 12/19/2017 21:27
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.19_537A_062 Heated Purge: (Y/N) N
 Calibration ID: 36012

| | 13PFOA | | PFOS | | AREA # | RT # |
|----------------|----------------------|---------|---------|---------|--------|------|
| | AREA # | RT # | AREA # | RT # | | |
| 12/24 HOUR STD | 1490421 | 1.81 | 3162377 | 2.06 | | |
| UPPER LIMIT | 2086589 | 2.31 | 4427328 | 2.56 | | |
| LOWER LIMIT | 1043295 | 1.31 | 2213664 | 1.56 | | |
| LAB SAMPLE ID | CLIENT SAMPLE ID | | | | | |
| 320-34181-8 | WGNA-121117-FRB-4846 | 1519488 | 1.81 | 3290304 | 2.07 | |
| 320-34181-9 | WGNA-121117-DUP14 | 1565140 | 1.81 | 3193781 | 2.06 | |

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Sample No.: CCV 320-200767/21 Date Analyzed: 12/19/2017 22:04
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.19_537A_070 Heated Purge: (Y/N) N
 Calibration ID: 36012

| | 13PFOA | | PFOS | | AREA # | RT # |
|----------------|----------------------|---------|---------|---------|--------|------|
| | AREA # | RT # | AREA # | RT # | | |
| 12/24 HOUR STD | 1464558 | 1.81 | 3048007 | 2.07 | | |
| UPPER LIMIT | 2050381 | 2.31 | 4267210 | 2.57 | | |
| LOWER LIMIT | 1025191 | 1.31 | 2133605 | 1.57 | | |
| LAB SAMPLE ID | CLIENT SAMPLE ID | | | | | |
| 320-34181-8 | WGNA-121117-FRB-4846 | 1519488 | 1.81 | 3290304 | 2.07 | |
| 320-34181-9 | WGNA-121117-DUP14 | 1565140 | 1.81 | 3193781 | 2.06 | |

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

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

Column used to flag values outside QC limits

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: WGNA-121117-RW-0488 Lab Sample ID: 320-34181-1
 Matrix: Water Lab File ID: 2017.12.19_537A_055.d
 Analysis Method: 537 Date Collected: 12/11/2017 11:40
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 228.6(mL) Date Analyzed: 12/19/2017 20:54
 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.: 200646 Units: ng/L

| CAS NO. | COMPOUND NAME | RESULT | Q | LOQ | LOD | DL |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 17 | U | 44 | 17 | 7.4 |
| 335-67-1 | Perfluorooctanoic acid (PFOA) | 11 | J | 22 | 8.7 | 3.1 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 22 | U | 26 | 22 | 8.7 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 7.3 | J | 33 | 13 | 6.0 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 5.3 | J | 11 | 4.4 | 2.1 |
| 375-73-5 | Perfluorobutanesulfonic acid (PFBS) | 39 | U | 98 | 39 | 18 |

| CAS NO. | SURROGATE | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 98 | | 70-130 |
| STL00996 | 13C2 PFDA | 100 | | 70-130 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_055.d
 Lims ID: 320-34181-A-1-A
 Client ID: WGNA-121117-RW-0488
 Sample Type: Client
 Inject. Date: 19-Dec-2017 20:54:32 ALS Bottle#: 37 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-1-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:23:00

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.366 | 1.444 | -0.078 | 1.000 | 121983 | 1.03 | | 274 | |
| 298.90 > 99.00 | 1.366 | 1.444 | -0.078 | 1.000 | 91677 | | 1.33(0.00-0.00) | 188 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.479 | 1.573 | -0.094 | 1.000 | 1572042 | 9.81 | | 10410 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.624 | 1.725 | -0.101 | 1.000 | 296761 | 1.67 | | 318 | |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.624 | 1.725 | -0.101 | 1.000 | 165527 | 1.21 | | 47.0 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.806 | 1.913 | -0.107 | | 1456980 | 10.0 | | 8335 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.813 | 1.914 | -0.101 | 1.000 | 331511 | 2.46 | | 44.5 | |
| 413.00 > 169.00 | 1.806 | 1.914 | -0.108 | 0.996 | 223507 | | 1.48(0.00-0.00) | 475 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.064 | 2.071 | -0.007 | 1.000 | 117887 | 1.19 | | 13.9 | |
| 499.00 > 99.00 | 2.064 | 2.071 | -0.007 | 1.000 | 19633 | | 6.00(0.00-0.00) | 17.6 | |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.064 | 2.151 | -0.087 | | 3037745 | 28.7 | | 5685 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.246 | 2.312 | -0.066 | 1.000 | 1118895 | 10.0 | | 9563 | |

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_055.d

Injection Date: 19-Dec-2017 20:54:32

Instrument ID: A8_N

Lims ID: 320-34181-A-1-A

Lab Sample ID: 320-34181-1

Client ID: WGNA-121117-RW-0488

Operator ID: SACINSTLCMS01

ALS Bottle#: 37

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

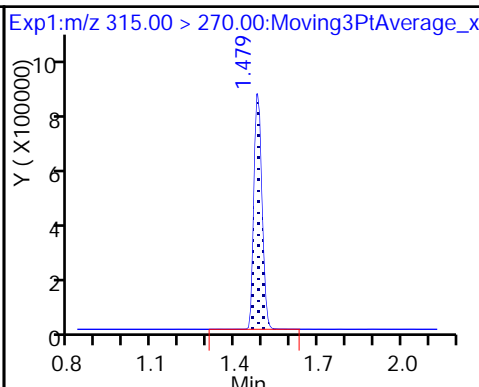
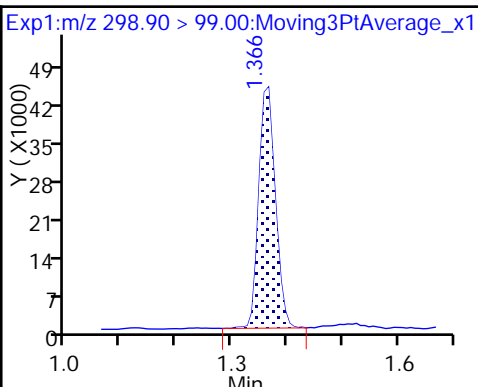
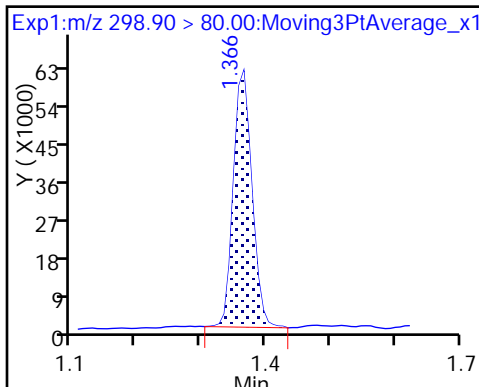
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

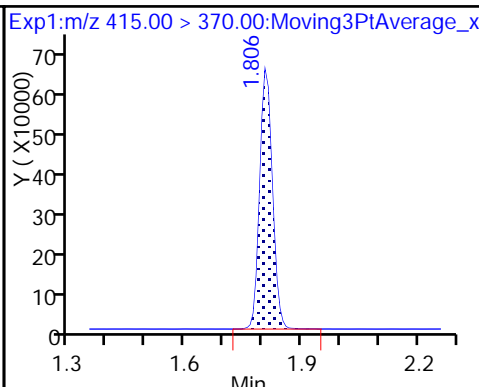
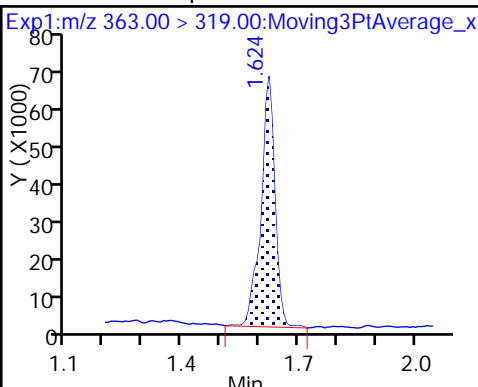
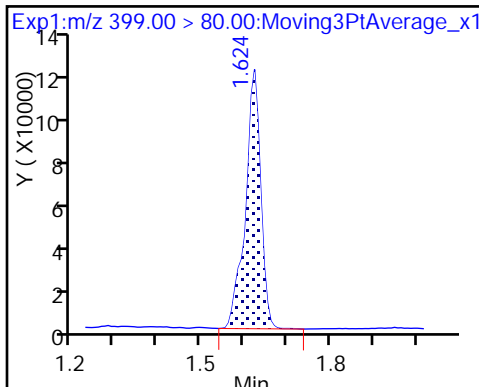
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

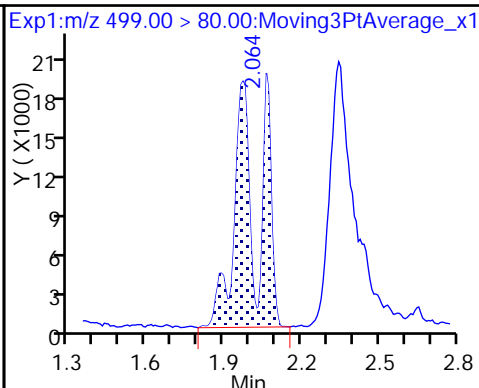
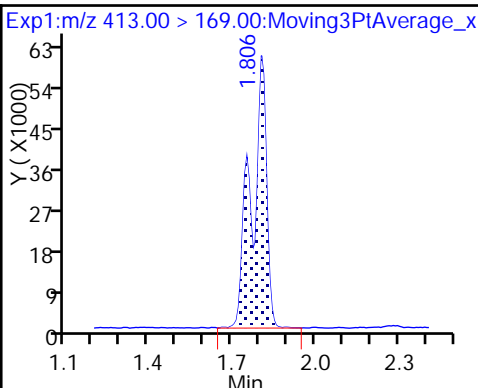
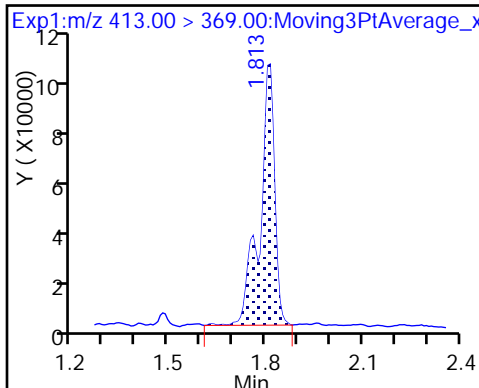
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

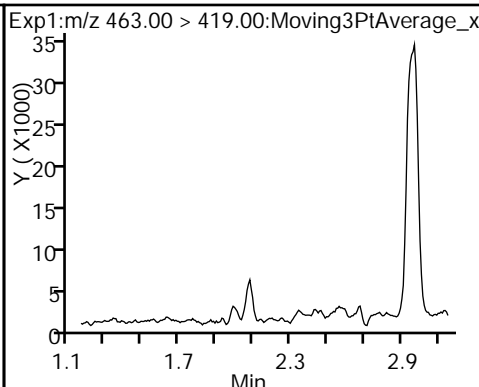
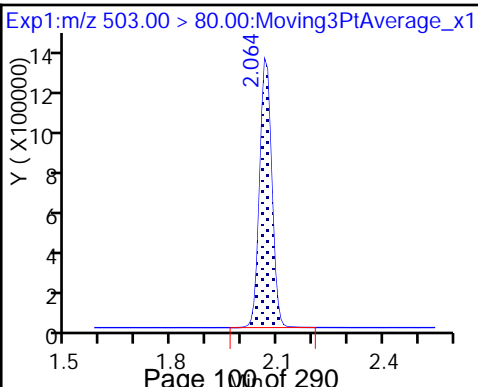
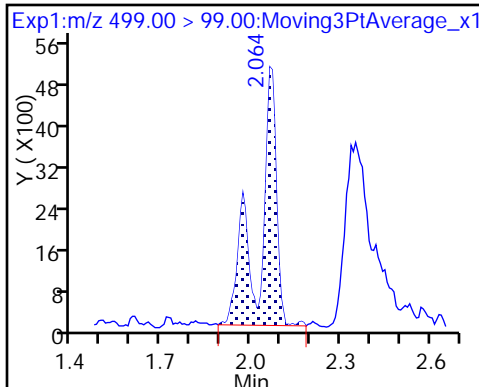
8 Perfluorooctane sulfonic acid



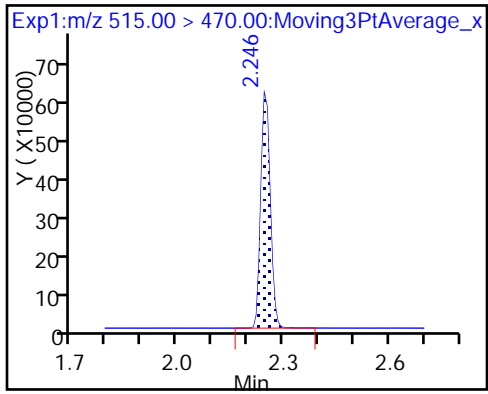
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_055.d
 Lims ID: 320-34181-A-1-A
 Client ID: WGNA-121117-RW-0488
 Sample Type: Client
 Inject. Date: 19-Dec-2017 20:54:32 ALS Bottle#: 37 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-1-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:23:00

| Compound | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0 | 9.81 | 98.06 |
| \$ 10 13C2 PFDA | 10.0 | 10.0 | 100.36 |

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: WGNA-121117-FRB-0488 Lab Sample ID: 320-34181-2
 Matrix: Water Lab File ID: 2017.12.19_537A_056.d
 Analysis Method: 537 Date Collected: 12/11/2017 11:35
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 253.6(mL) Date Analyzed: 12/19/2017 20:59
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200646 Units: ng/L

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

| CAS NO. | SURROGATE | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 92 | | 70-130 |
| STL00996 | 13C2 PFDA | 89 | | 70-130 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_056.d
 Lims ID: 320-34181-A-2-A
 Client ID: WGNA-121117-FRB-0488
 Sample Type: Client
 Inject. Date: 19-Dec-2017 20:59:14 ALS Bottle#: 38 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-2-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:23:45

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|-----------------|-----------------|--------|--------|--------|----------|--------------|---------------|------|-------|
| \$ 2 13C2 PFHxA | 315.00 > 270.00 | 1.479 | 1.573 | -0.094 | 1.000 | 1555673 | 9.16 | 9978 | |
| * 6 13C2-PFOA | 415.00 > 370.00 | 1.806 | 1.913 | -0.107 | | 1544196 | 10.0 | 8000 | |
| * 7 13C4 PFOS | 503.00 > 80.00 | 2.064 | 2.151 | -0.087 | | 3255698 | 28.7 | 8361 | |
| \$ 10 13C2 PFDA | 515.00 > 470.00 | 2.246 | 2.312 | -0.066 | 1.000 | 1045931 | 8.85 | 7991 | |

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_056.d

Injection Date: 19-Dec-2017 20:59:14

Instrument ID: A8_N

Lims ID: 320-34181-A-2-A

Lab Sample ID: 320-34181-2

Client ID: WGNA-121117-FRB-0488

Operator ID: SACINSTLCMS01

ALS Bottle#: 38

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

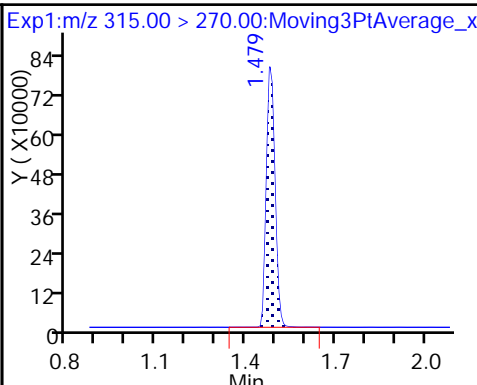
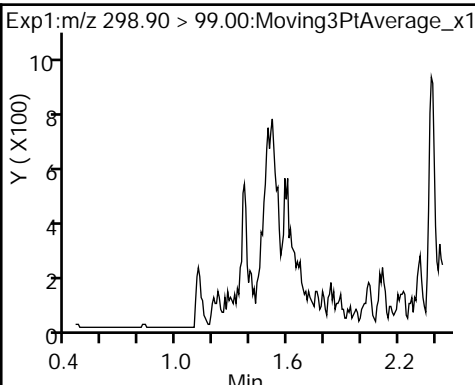
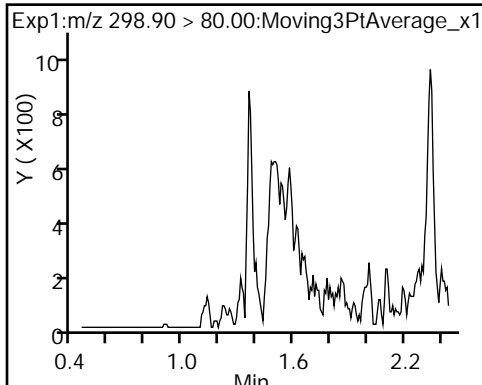
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

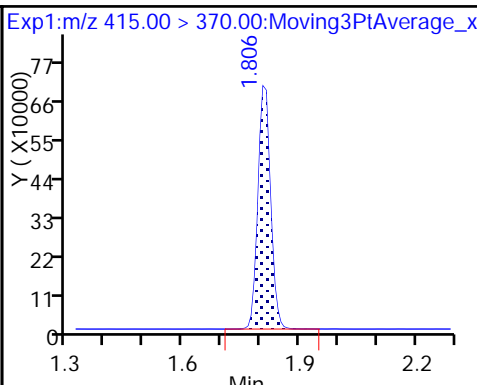
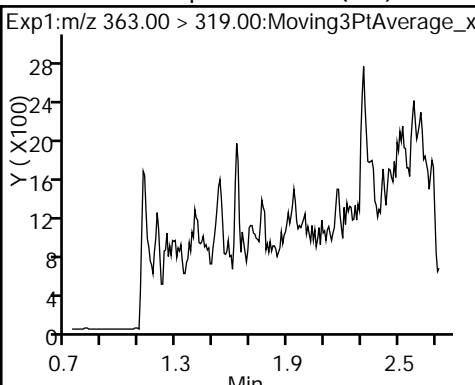
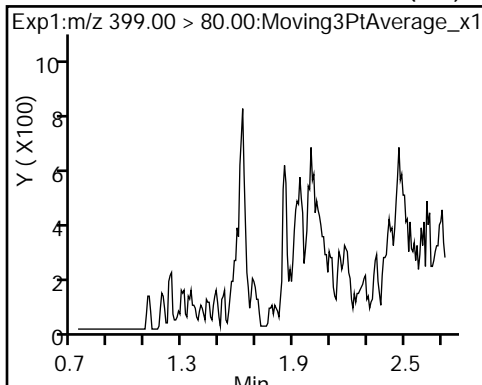
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

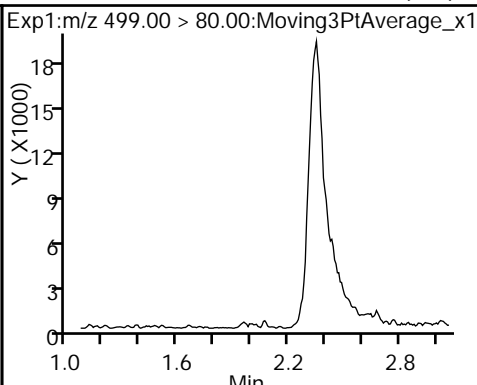
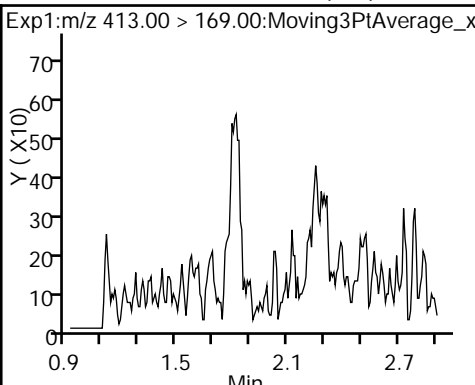
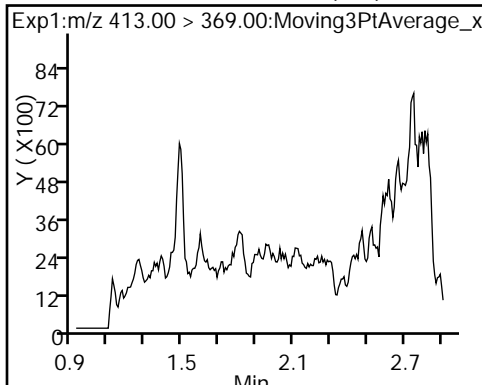
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

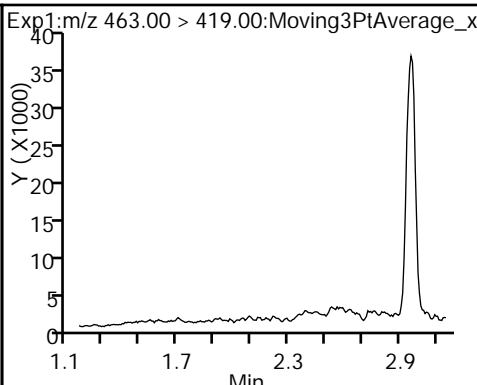
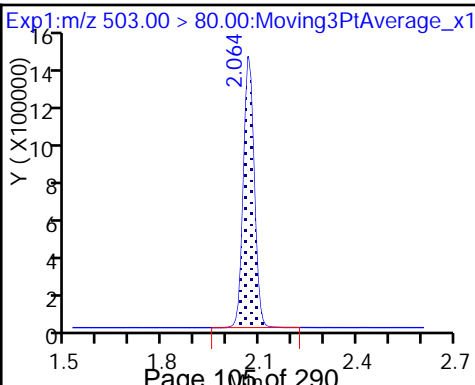
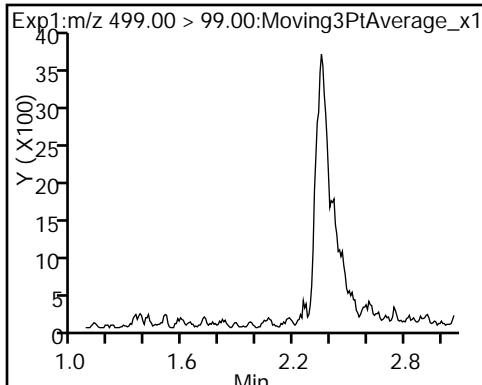
8 Perfluorooctane sulfonic acid (ND)



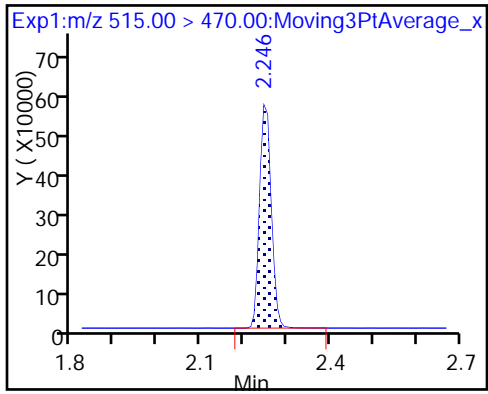
8 Perfluorooctane sulfonic acid (ND)

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_056.d
 Lims ID: 320-34181-A-2-A
 Client ID: WGNA-121117-FRB-0488
 Sample Type: Client
 Inject. Date: 19-Dec-2017 20:59:14 ALS Bottle#: 38 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-2-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:23:45

| Compound | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0 | 9.16 | 91.56 |
| \$ 10 13C2 PFDA | 10.0 | 8.85 | 88.52 |

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: NAWC-121117-RW-136 Lab Sample ID: 320-34181-3
 Matrix: Water Lab File ID: 2017.12.19_537A_057.d
 Analysis Method: 537 Date Collected: 12/11/2017 12:40
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 246(mL) Date Analyzed: 12/19/2017 21:03
 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.: 200646 Units: ng/L

| CAS NO. | COMPOUND NAME | RESULT | Q | LOQ | LOD | DL |
|-----------|--------------------------------------|--------|-----|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 8.6 | J | 41 | 16 | 6.9 |
| 335-67-1 | Perfluorooctanoic acid (PFOA) | 12 | J | 20 | 8.1 | 2.8 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 20 | U M | 24 | 20 | 8.1 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 12 | U M | 30 | 12 | 5.6 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 4.5 | J | 10 | 4.1 | 1.9 |
| 375-73-5 | Perfluorobutanesulfonic acid (PFBS) | 37 | U | 91 | 37 | 16 |

| CAS NO. | SURROGATE | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 85 | | 70-130 |
| STL00996 | 13C2 PFDA | 87 | | 70-130 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_057.d
 Lims ID: 320-34181-A-3-A
 Client ID: NAWC-121117-RW-136
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:03:56 ALS Bottle#: 39 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-3-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:24:42

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.366 | 1.444 | -0.078 | 1.000 | 109019 | 0.8368 | | 150 | |
| 298.90 > 99.00 | 1.366 | 1.444 | -0.078 | 1.000 | 74007 | | 1.47(0.00-0.00) | 160 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.479 | 1.573 | -0.094 | 1.000 | 1472463 | 8.50 | | 8969 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.624 | 1.725 | -0.101 | 1.000 | 113897 | 0.5839 | | 88.3 | M |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.624 | 1.725 | -0.101 | 1.000 | 162369 | 1.10 | | 40.2 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.806 | 1.913 | -0.107 | | 1574402 | 10.0 | | 8783 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.806 | 1.914 | -0.108 | 1.000 | 426136 | 2.92 | | 62.5 | |
| 413.00 > 169.00 | 1.806 | 1.914 | -0.108 | 1.000 | 257408 | | 1.66(0.00-0.00) | 645 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.064 | 2.071 | -0.007 | 1.000 | 231146 | 2.11 | | 31.1 | |
| 499.00 > 99.00 | 2.064 | 2.071 | -0.007 | 1.000 | 38109 | | 6.07(0.00-0.00) | 36.5 | |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.064 | 2.151 | -0.087 | | 3341880 | 28.7 | | 5392 | |
| 9 Perfluorononanoic acid | | | | | | | | | |
| 463.00 > 419.00 | 2.071 | 2.158 | -0.087 | 1.000 | 38479 | 0.3680 | | 6.1 | M |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.246 | 2.312 | -0.066 | 1.000 | 1047743 | 8.70 | | 9722 | |

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_057.d

Injection Date: 19-Dec-2017 21:03:56

Instrument ID: A8_N

Lims ID: 320-34181-A-3-A

Lab Sample ID: 320-34181-3

Client ID: NAWC-121117-RW-136

Operator ID: SACINSTLCMS01

ALS Bottle#: 39

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

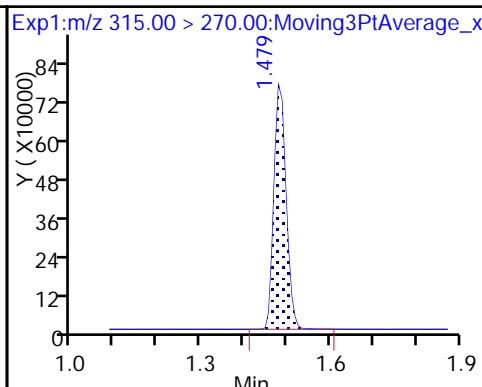
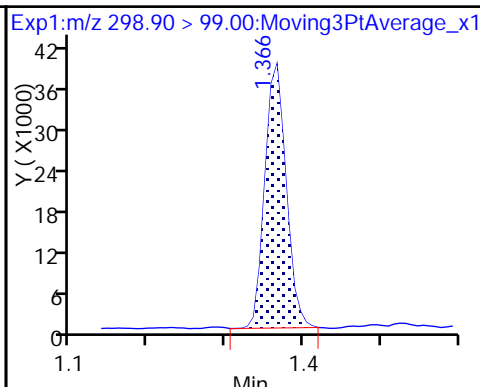
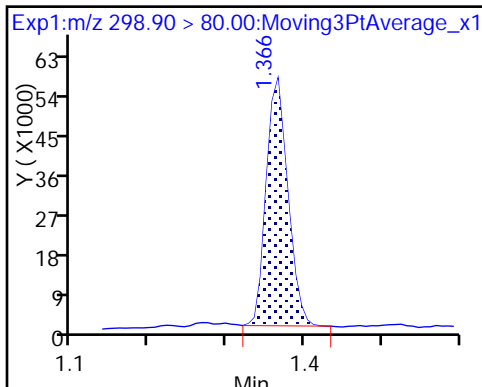
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

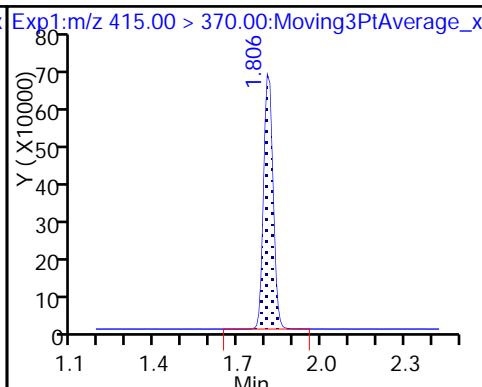
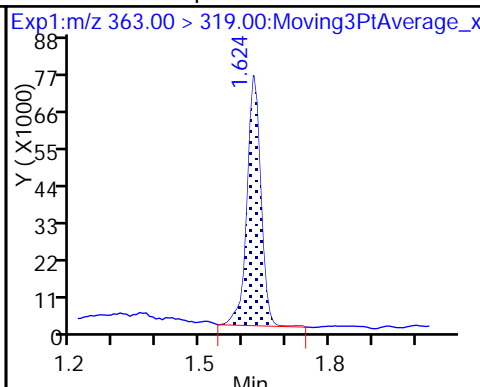
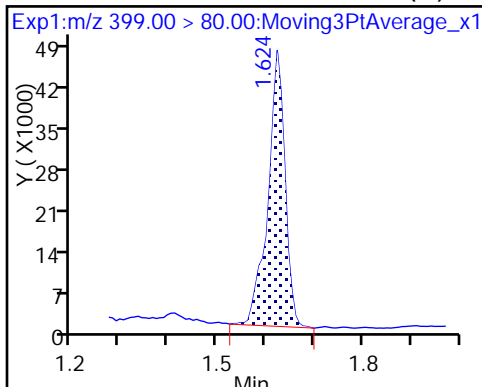
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (M)

4 Perfluoroheptanoic acid

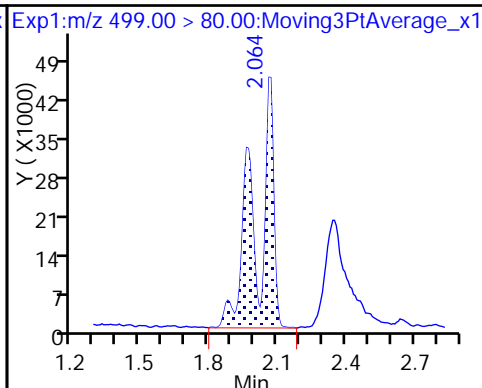
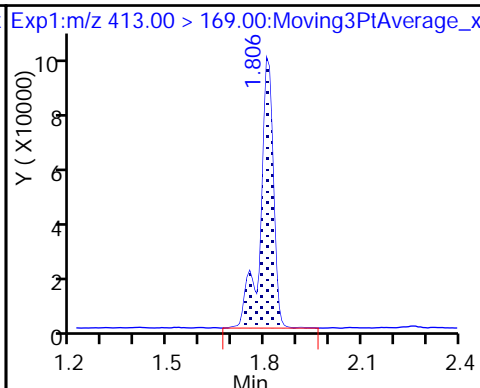
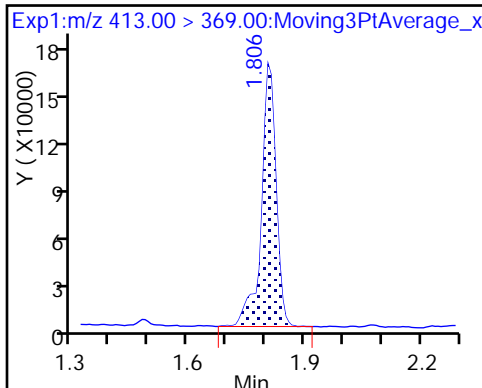
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

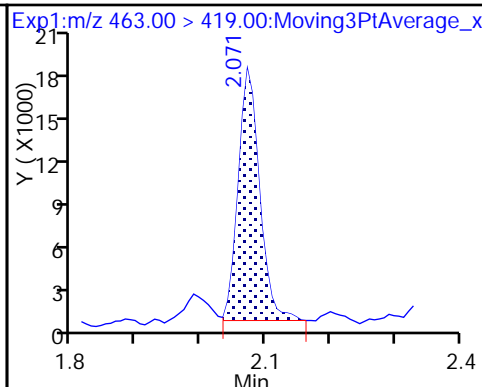
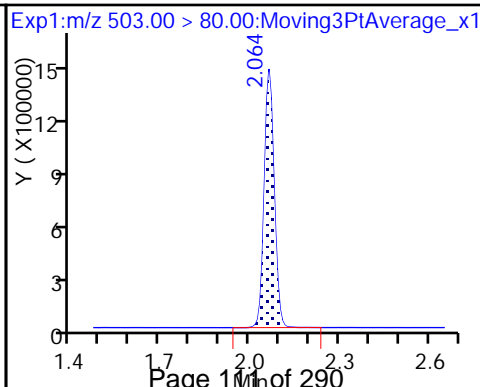
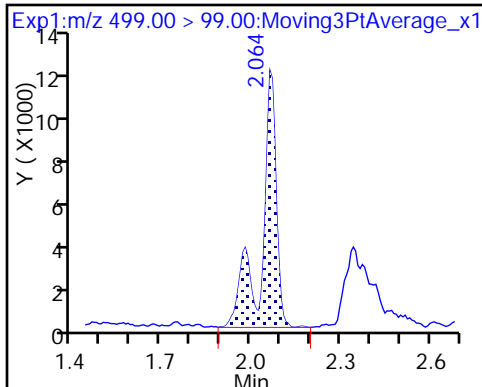
8 Perfluorooctane sulfonic acid



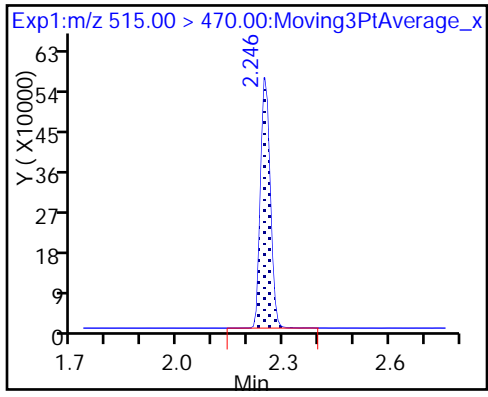
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_057.d
 Lims ID: 320-34181-A-3-A
 Client ID: NAWC-121117-RW-136
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:03:56 ALS Bottle#: 39 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-3-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:24:42

| Compound | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0 | 8.50 | 85.00 |
| \$ 10 13C2 PFDA | 10.0 | 8.70 | 86.97 |

TestAmerica Sacramento

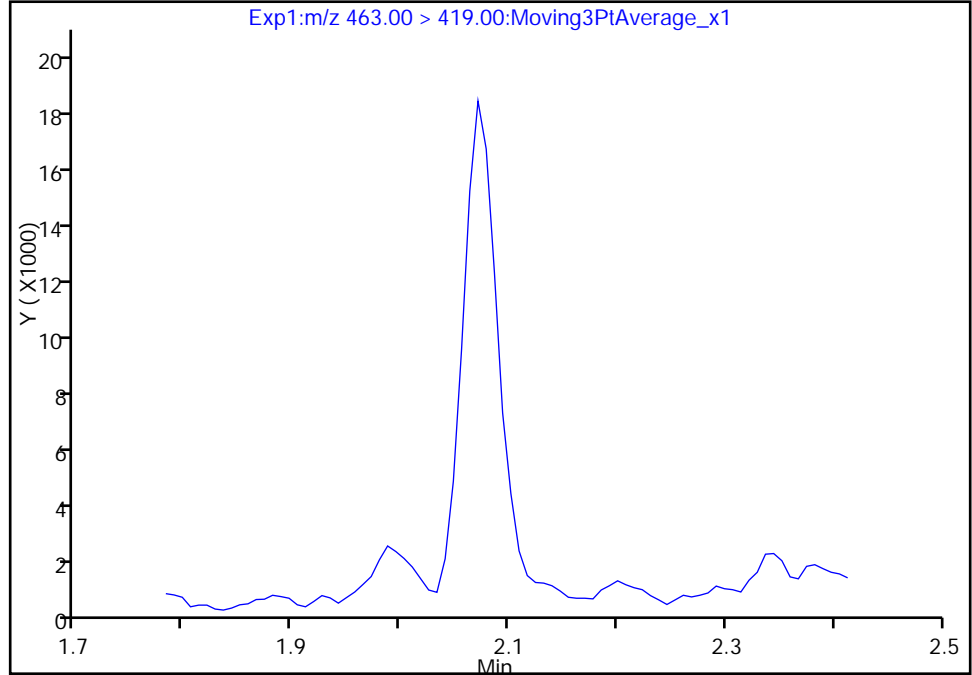
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_057.d
Injection Date: 19-Dec-2017 21:03:56 Instrument ID: A8_N
Lims ID: 320-34181-A-3-A Lab Sample ID: 320-34181-3
Client ID: NAWC-121117-RW-136
Operator ID: SACINSTLCMS01 ALS Bottle#: 39 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

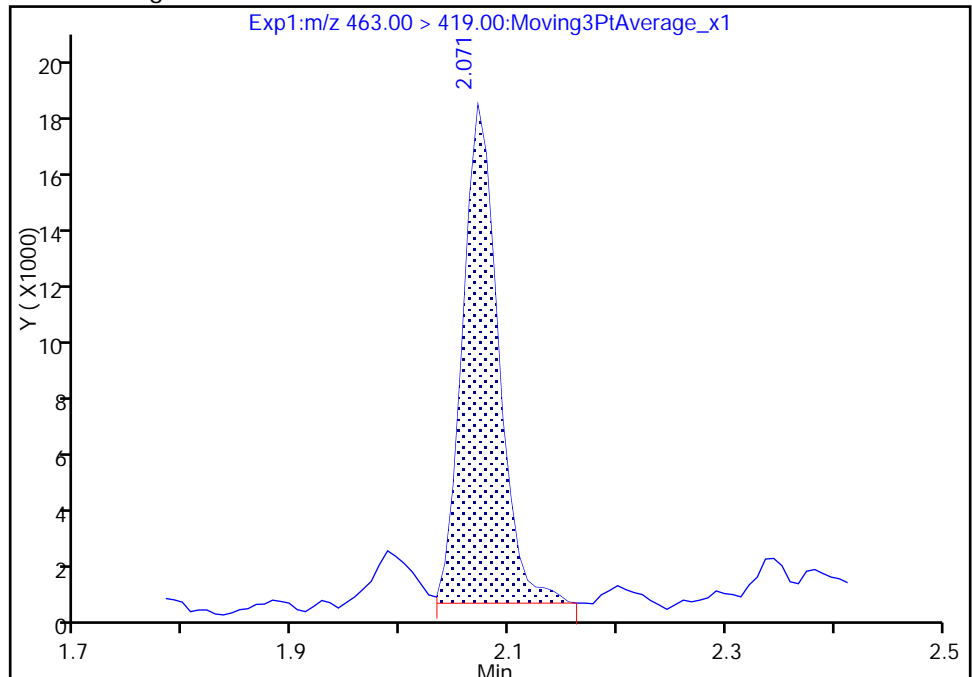
Not Detected
Expected RT: 2.16

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 38479
Amount: 0.367989
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:24:33
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

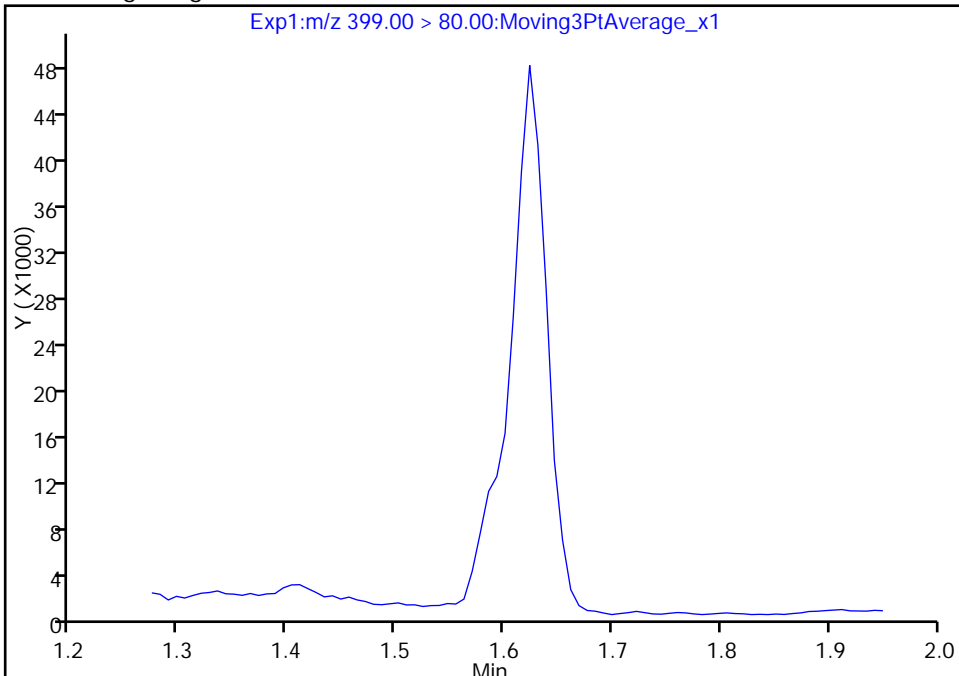
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Injection Date: 19-Dec-2017 21:03:56 Instrument ID: A8_N
Lims ID: 320-34181-A-3-A Lab Sample ID: 320-34181-3
Client ID: NAWC-121117-RW-136
Operator ID: SACINSTLCMS01 ALS Bottle#: 39 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

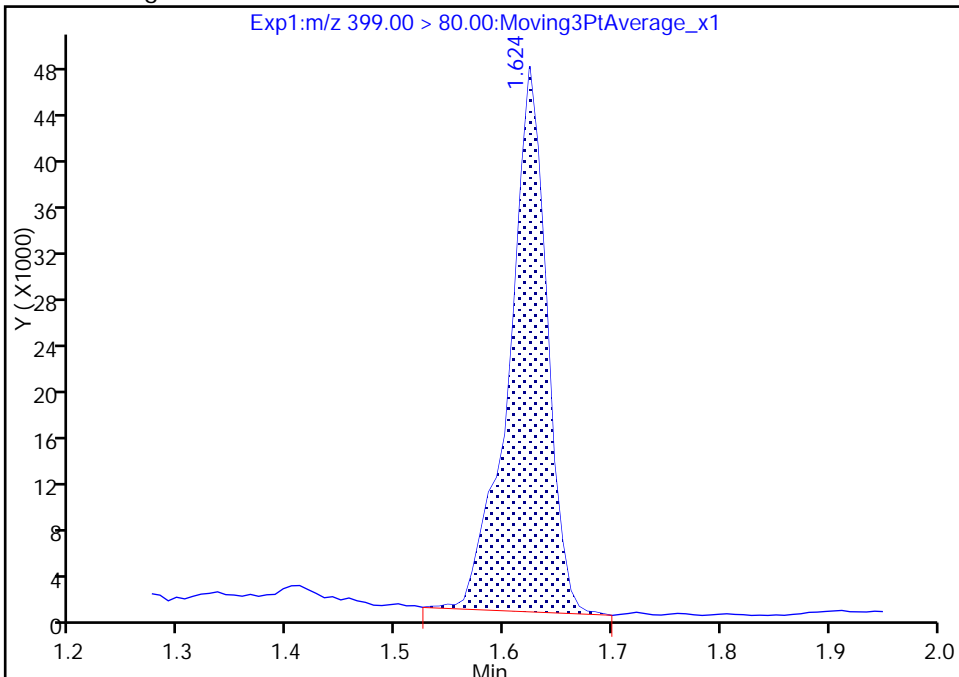
Not Detected
Expected RT: 1.72

Processing Integration Results



Manual Integration Results

RT: 1.62
Area: 113897
Amount: 0.583868
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:24:09
Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: NAWC-121117-FRB-136 Lab Sample ID: 320-34181-4
 Matrix: Water Lab File ID: 2017.12.19_537A_058.d
 Analysis Method: 537 Date Collected: 12/11/2017 12:35
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 248.7(mL) Date Analyzed: 12/19/2017 21:08
 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.: 200646 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 | 99 | | 70-130 |
| STL00996 | 13C2 PFDA | 95 | | 70-130 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_058.d
 Lims ID: 320-34181-A-4-A
 Client ID: NAWC-121117-FRB-136
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:08:36 ALS Bottle#: 40 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-4-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:25:10

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|-----------------|-----------------|--------|--------|--------|----------|--------------|---------------|-------|-------|
| \$ 2 13C2 PFHxA | 315.00 > 270.00 | 1.479 | 1.573 | -0.094 | 1.000 | 1606653 | 9.88 | 10699 | |
| * 6 13C2-PFOA | 415.00 > 370.00 | 1.806 | 1.913 | -0.107 | | 1478101 | 10.0 | 8114 | |
| * 7 13C4 PFOS | 503.00 > 80.00 | 2.064 | 2.151 | -0.087 | | 3156769 | 28.7 | 8381 | |
| \$ 10 13C2 PFDA | 515.00 > 470.00 | 2.246 | 2.312 | -0.066 | 1.000 | 1072934 | 9.49 | 8325 | |

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_058.d

Injection Date: 19-Dec-2017 21:08:36

Instrument ID: A8_N

Lims ID: 320-34181-A-4-A

Lab Sample ID: 320-34181-4

Client ID: NAWC-121117-FRB-136

Operator ID: SACINSTLCMS01

ALS Bottle#: 40

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

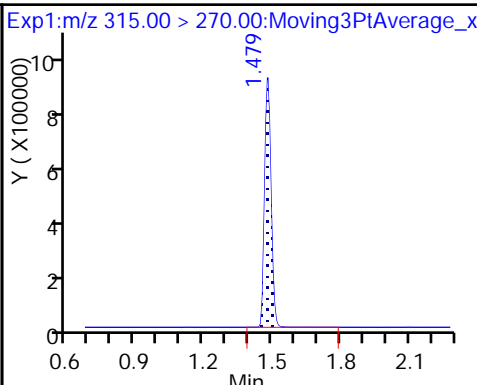
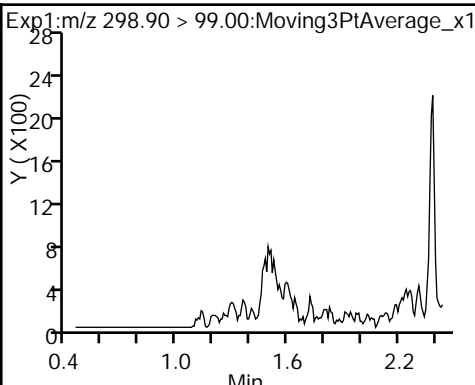
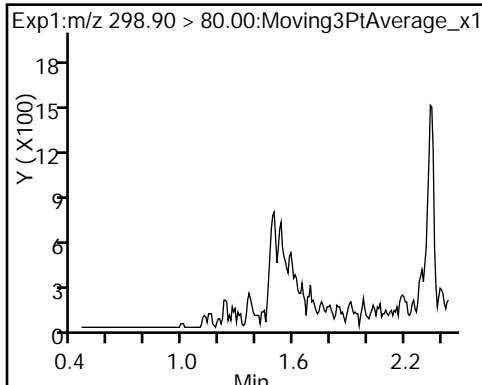
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

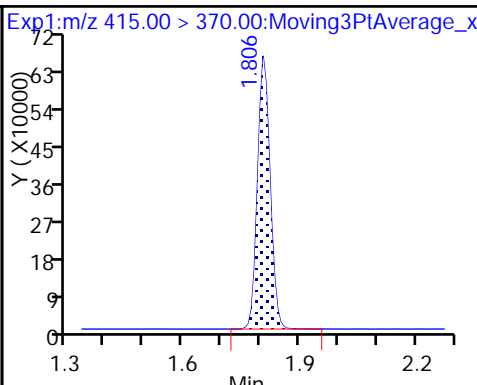
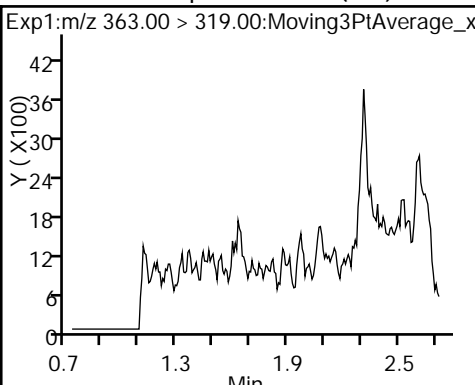
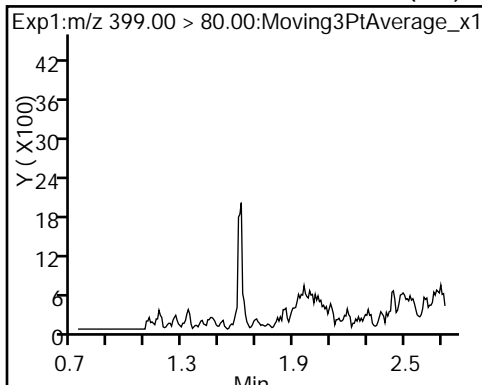
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

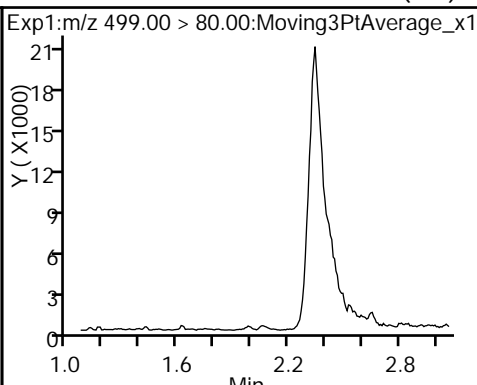
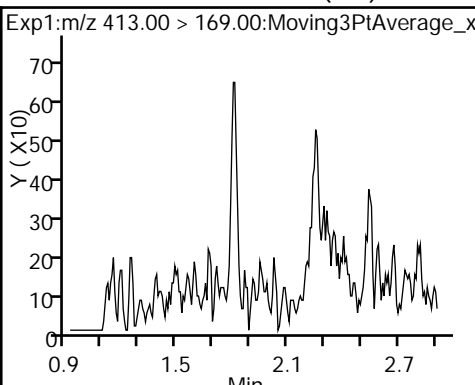
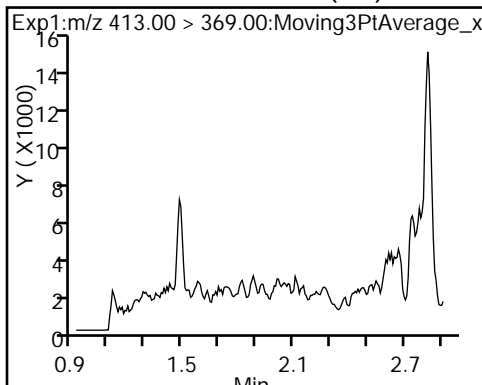
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

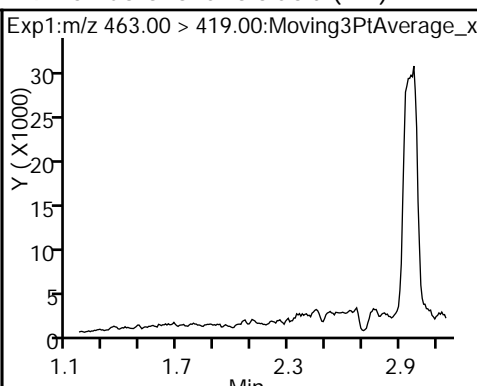
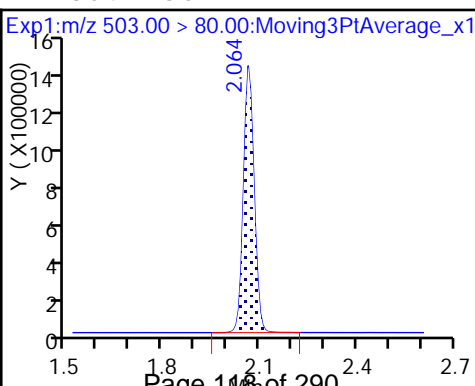
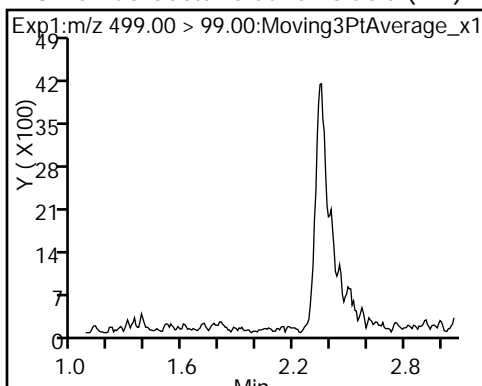
8 Perfluorooctane sulfonic acid (ND)



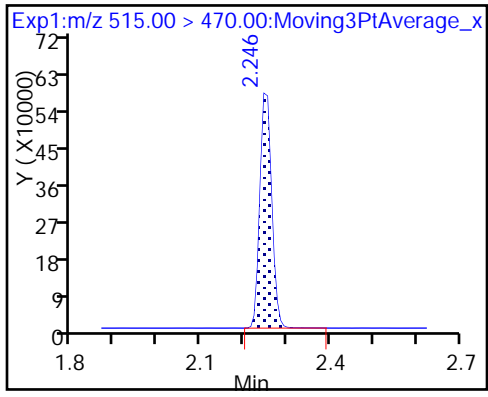
8 Perfluorooctane sulfonic acid (ND)

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_058.d
 Lims ID: 320-34181-A-4-A
 Client ID: NAWC-121117-FRB-136
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:08:36 ALS Bottle#: 40 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-4-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:25:10

| Compound | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0 | 9.88 | 98.79 |
| \$ 10 13C2 PFDA | 10.0 | 9.49 | 94.86 |

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: NAWC-121117-RW-040 Lab Sample ID: 320-34181-5
 Matrix: Water Lab File ID: 2017.12.19_537A_059.d
 Analysis Method: 537 Date Collected: 12/11/2017 13:10
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 248.4 (mL) Date Analyzed: 12/19/2017 21:13
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200646 Units: ng/L

| CAS NO. | COMPOUND NAME | RESULT | Q | LOQ | LOD | DL |
|-----------|--------------------------------------|--------|-----|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 18 | J M | 40 | 16 | 6.8 |
| 335-67-1 | Perfluorooctanoic acid (PFOA) | 18 | J | 20 | 8.1 | 2.8 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 20 | U | 24 | 20 | 8.1 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 7.3 | J | 30 | 12 | 5.5 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 5.2 | J | 10 | 4.0 | 1.9 |
| 375-73-5 | Perfluorobutanesulfonic acid (PFBS) | 36 | U | 91 | 36 | 16 |

| CAS NO. | SURROGATE | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 90 | | 70-130 |
| STL00996 | 13C2 PFDA | 97 | | 70-130 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_059.d
 Lims ID: 320-34181-A-5-A
 Client ID: NAWC-121117-RW-040
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:13:17 ALS Bottle#: 41 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-5-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:26:11

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.373 | 1.444 | -0.071 | 1.000 | 175060 | 1.33 | | 81.4 | |
| 298.90 > 99.00 | 1.366 | 1.444 | -0.078 | 0.994 | 127844 | | 1.37(0.00-0.00) | 262 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.487 | 1.573 | -0.086 | 1.000 | 1539648 | 8.99 | | 10041 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.631 | 1.725 | -0.094 | 1.000 | 355347 | 1.81 | | 140 | |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.631 | 1.725 | -0.094 | 1.000 | 189605 | 1.30 | | 35.2 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.813 | 1.913 | -0.100 | | 1556701 | 10.0 | | 8171 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.813 | 1.914 | -0.101 | 1.000 | 642466 | 4.46 | | 89.5 | |
| 413.00 > 169.00 | 1.813 | 1.914 | -0.101 | 1.000 | 370781 | | 1.73(0.00-0.00) | 892 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.071 | 2.071 | 0.0 | 1.000 | 480086 | 4.35 | | 49.9 | M |
| 499.00 > 99.00 | 2.071 | 2.071 | 0.0 | 1.000 | 82564 | | 5.81(0.00-0.00) | 70.9 | M |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.071 | 2.151 | -0.080 | | 3369191 | 28.7 | | 2982 | |
| 9 Perfluorononanoic acid | | | | | | | | | |
| 463.00 > 419.00 | 2.079 | 2.158 | -0.079 | 1.000 | 56090 | 0.5425 | | 7.9 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.253 | 2.312 | -0.059 | 1.000 | 1151295 | 9.67 | | 10030 | |

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_059.d

Injection Date: 19-Dec-2017 21:13:17

Instrument ID: A8_N

Lims ID: 320-34181-A-5-A

Lab Sample ID: 320-34181-5

Client ID: NAWC-121117-RW-040

Operator ID: SACINSTLCMS01

ALS Bottle#: 41

Worklist Smp#: 10

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

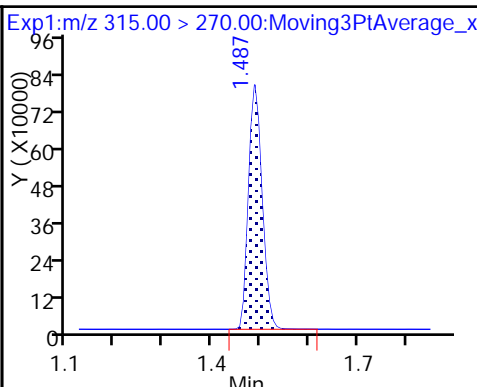
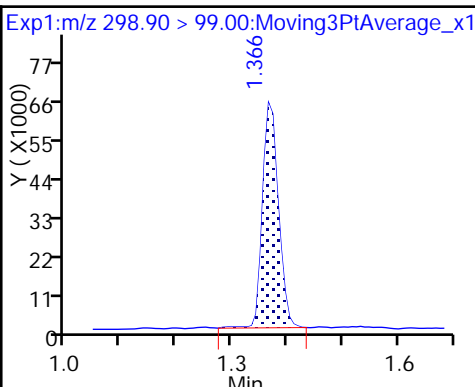
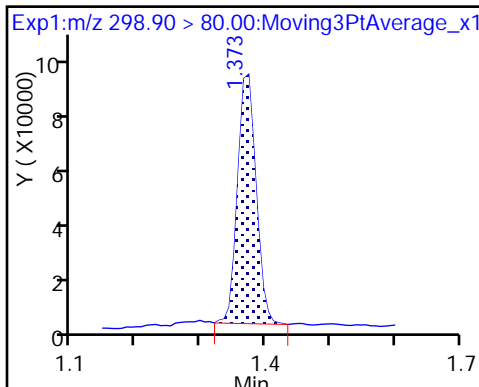
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

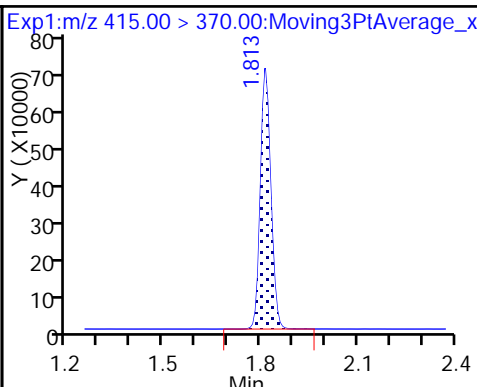
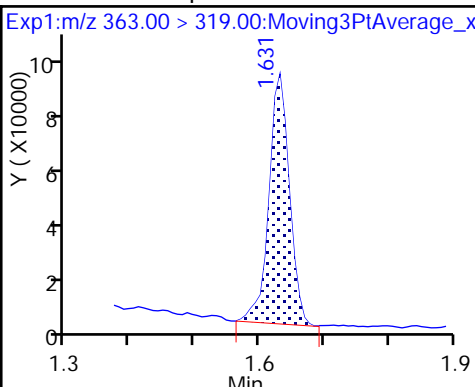
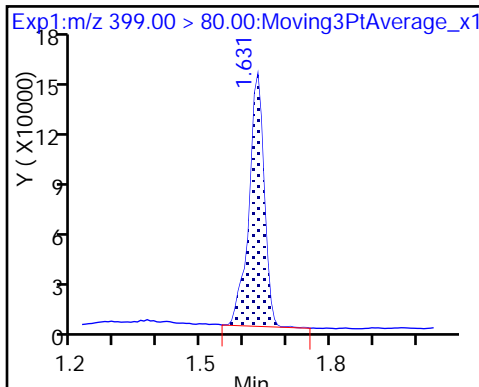
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

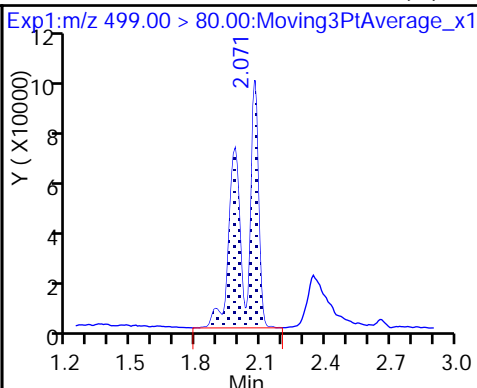
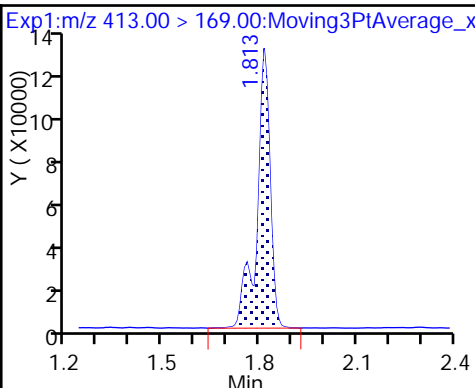
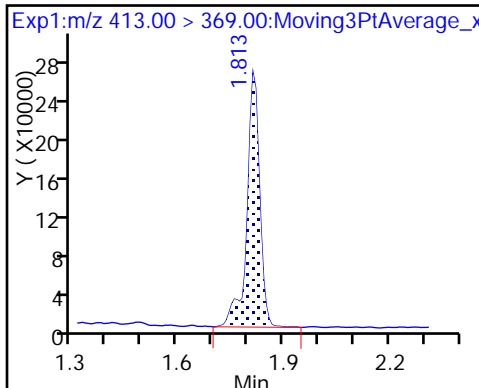
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

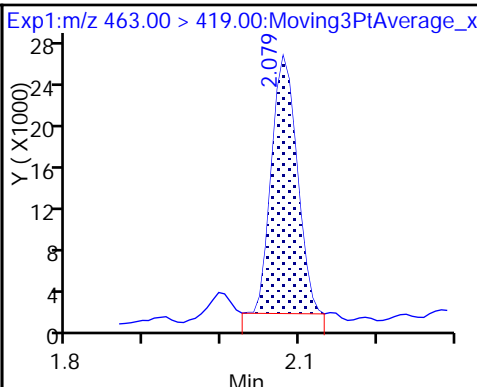
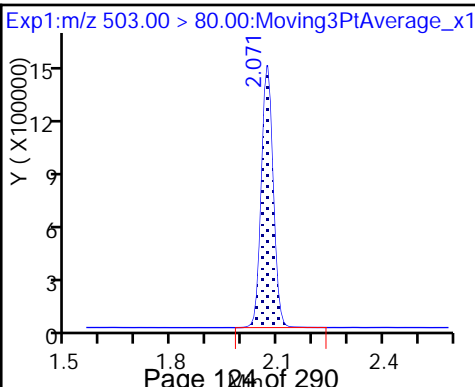
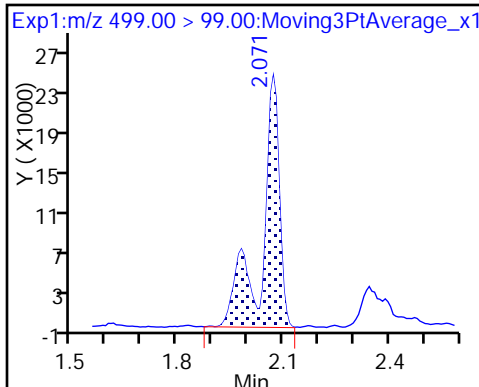
8 Perfluorooctane sulfonic acid (M)



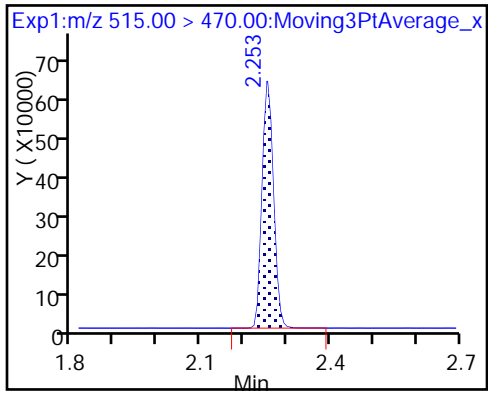
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_059.d
 Lims ID: 320-34181-A-5-A
 Client ID: NAWC-121117-RW-040
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:13:17 ALS Bottle#: 41 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-5-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:26:11

| Compound | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0 | 8.99 | 89.89 |
| \$ 10 13C2 PFDA | 10.0 | 9.67 | 96.65 |

TestAmerica Sacramento

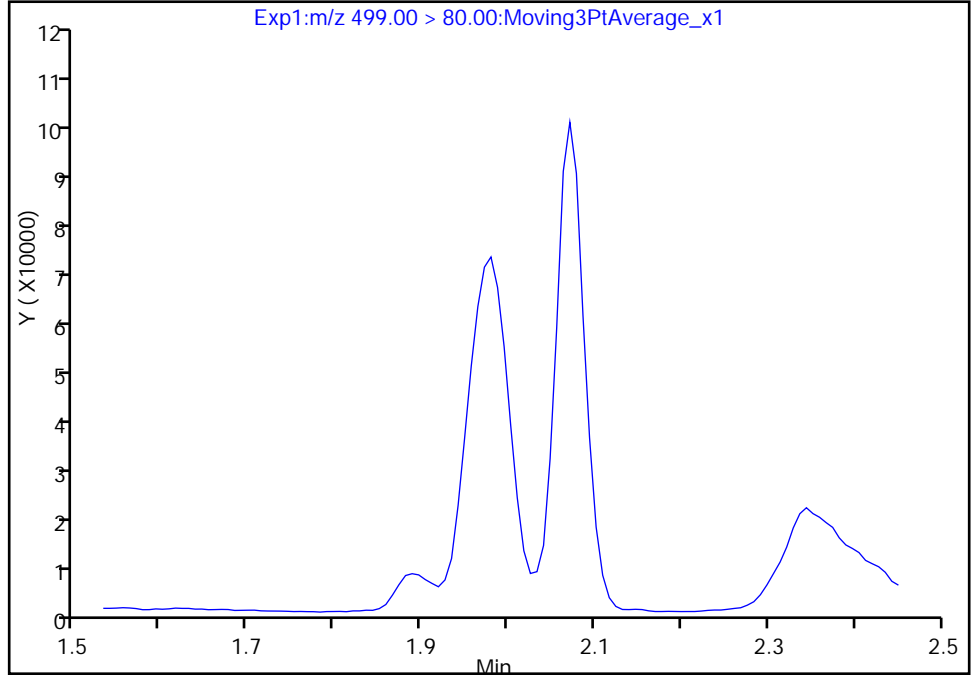
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_059.d
Injection Date: 19-Dec-2017 21:13:17 Instrument ID: A8_N
Lims ID: 320-34181-A-5-A Lab Sample ID: 320-34181-5
Client ID: NAWC-121117-RW-040
Operator ID: SACINSTLCMS01 ALS Bottle#: 41 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

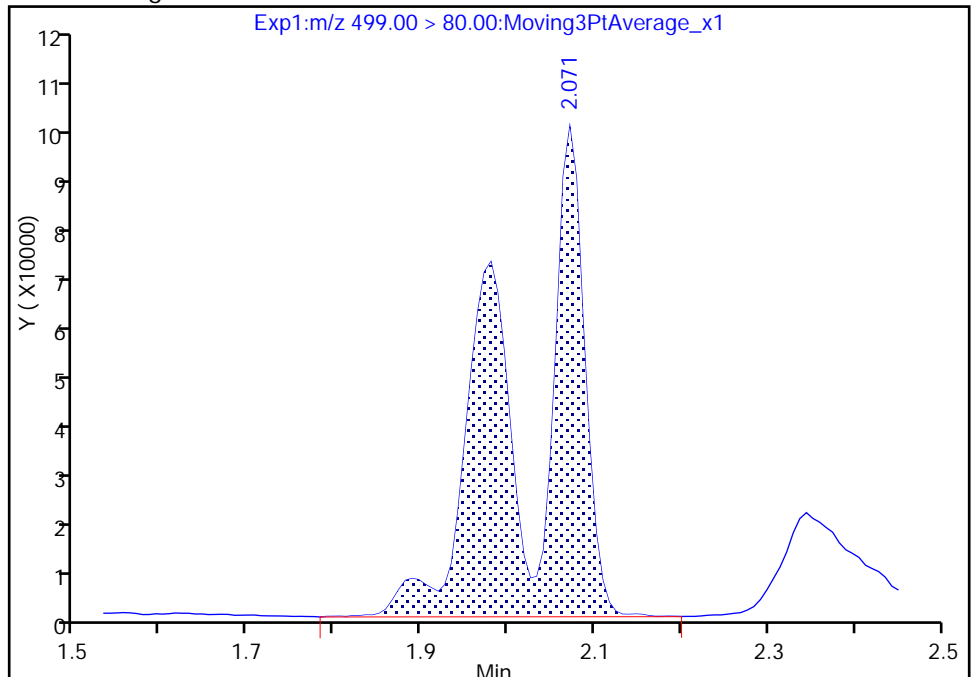
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 480086
Amount: 4.352419
Amount Units: ng/ml



TestAmerica Sacramento

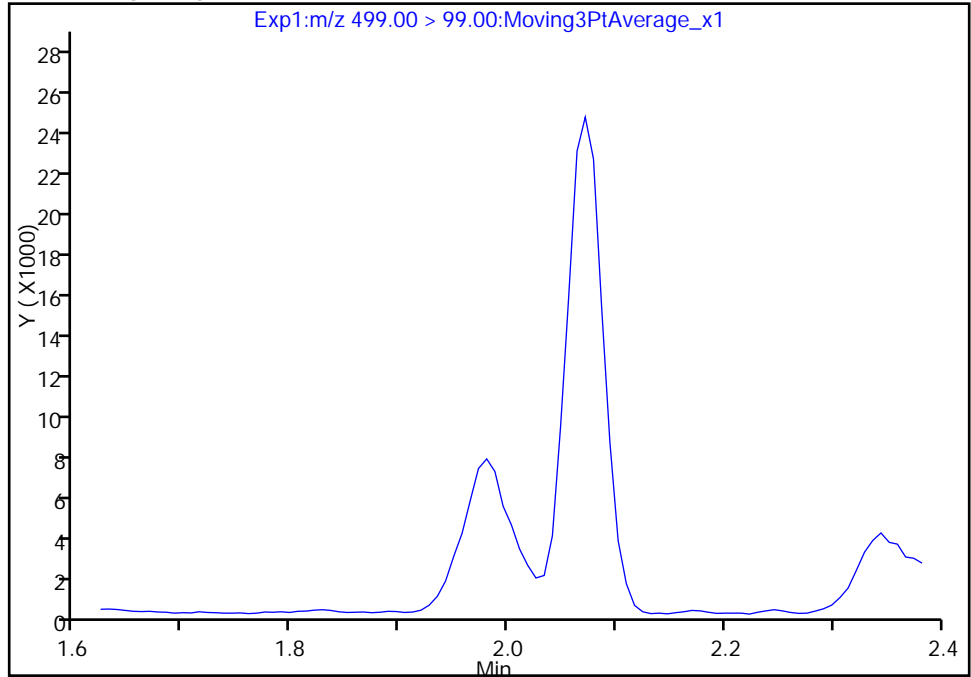
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Injection Date: 19-Dec-2017 21:13:17 Instrument ID: A8_N
Lims ID: 320-34181-A-5-A Lab Sample ID: 320-34181-5
Client ID: NAWC-121117-RW-040
Operator ID: SACINSTLCMS01 ALS Bottle#: 41 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

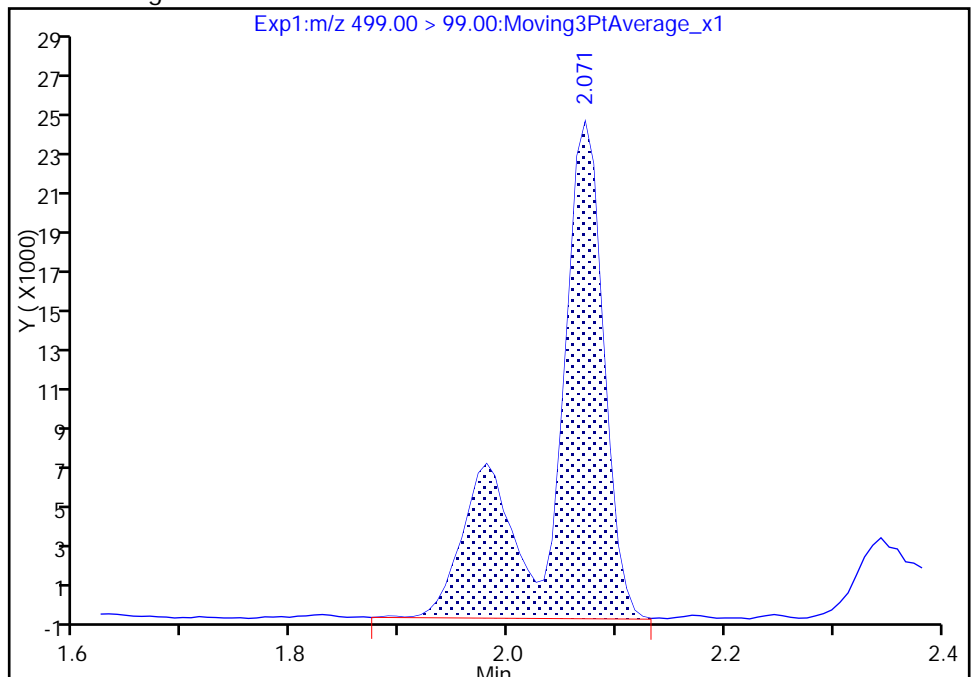
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 82564
Amount: 4.352419
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:25:45

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

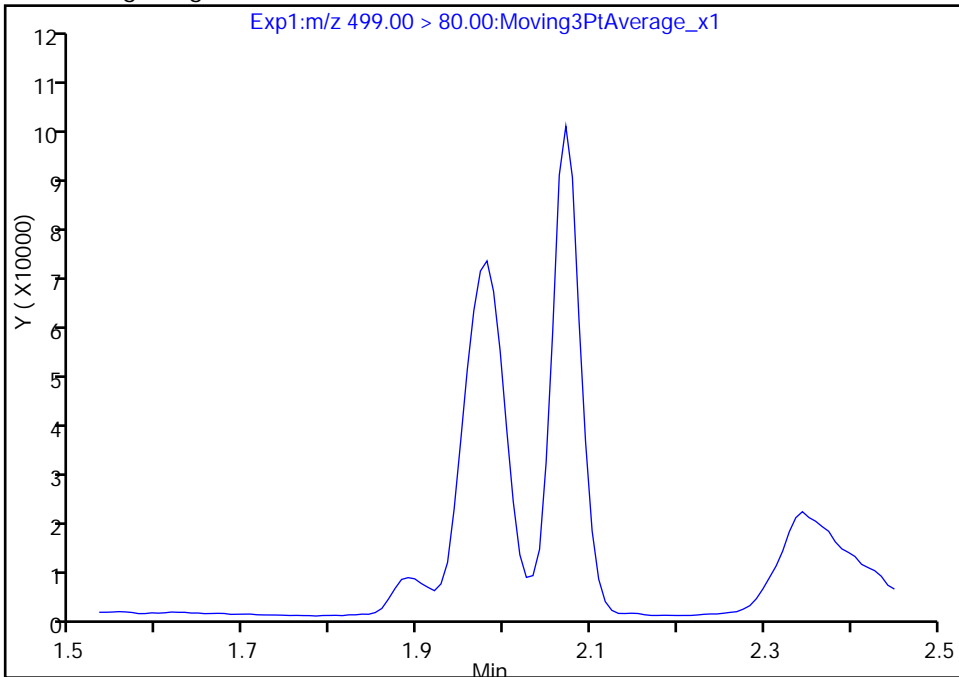
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_059.d
Injection Date: 19-Dec-2017 21:13:17 Instrument ID: A8_N
Lims ID: 320-34181-A-5-A Lab Sample ID: 320-34181-5
Client ID: NAWC-121117-RW-040
Operator ID: SACINSTLCMS01 ALS Bottle#: 41 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

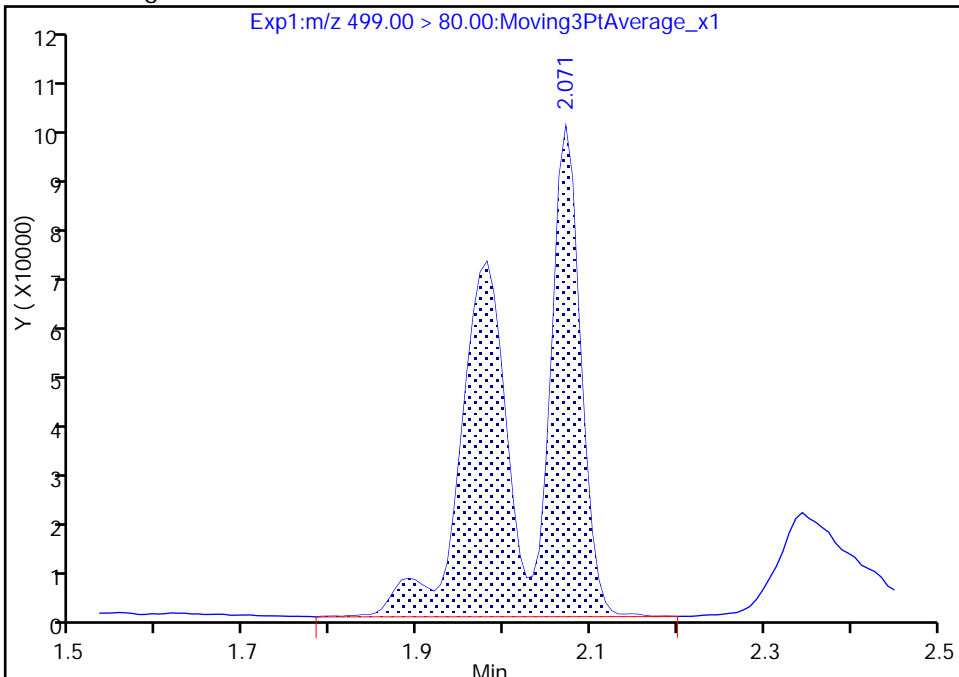
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 480086
Amount: 4.352419
Amount Units: ng/ml



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: NAWC-121117-FRB-040 Lab Sample ID: 320-34181-6
 Matrix: Water Lab File ID: 2017.12.19_537A_060.d
 Analysis Method: 537 Date Collected: 12/11/2017 13:05
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 247.4 (mL) Date Analyzed: 12/19/2017 21:17
 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.: 200646 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 | 92 | | 70-130 |
| STL00996 | 13C2 PFDA | 98 | | 70-130 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_060.d
 Lims ID: 320-34181-A-6-A
 Client ID: NAWC-121117-FRB-040
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:17:58 ALS Bottle#: 42 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-6-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:26:44

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|-----------------|-----------------|--------|--------|--------|----------|--------------|---------------|------|-------|
| \$ 2 13C2 PFHxA | 315.00 > 270.00 | 1.479 | 1.573 | -0.094 | 1.000 | 1546773 | 9.18 | 9918 | |
| * 6 13C2-PFOA | 415.00 > 370.00 | 1.806 | 1.913 | -0.107 | | 1531447 | 10.0 | 7342 | |
| * 7 13C4 PFOS | 503.00 > 80.00 | 2.064 | 2.151 | -0.087 | | 3175241 | 28.7 | 6736 | |
| \$ 10 13C2 PFDA | 515.00 > 470.00 | 2.253 | 2.312 | -0.059 | 1.000 | 1149915 | 9.81 | 9577 | |

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_060.d

Injection Date: 19-Dec-2017 21:17:58

Instrument ID: A8_N

Lims ID: 320-34181-A-6-A

Lab Sample ID: 320-34181-6

Client ID: NAWC-121117-FRB-040

Operator ID: SACINSTLCMS01

ALS Bottle#: 42

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

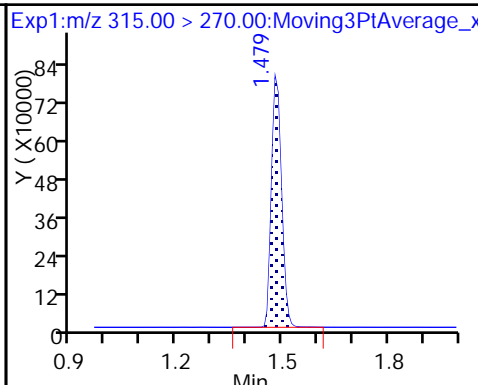
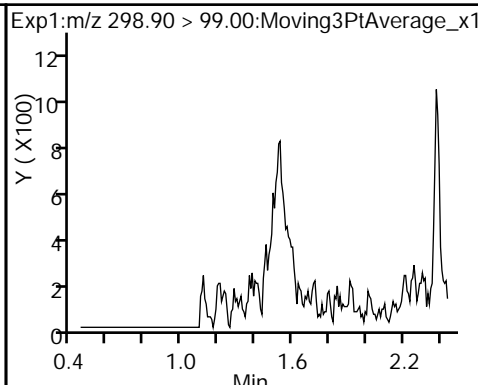
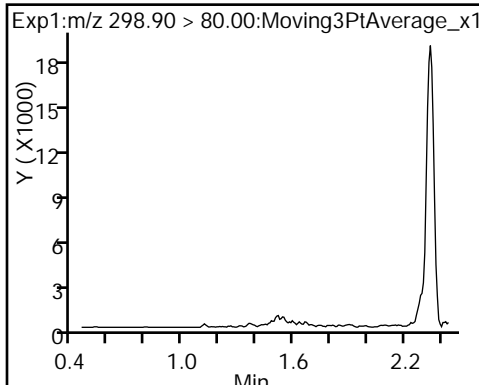
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

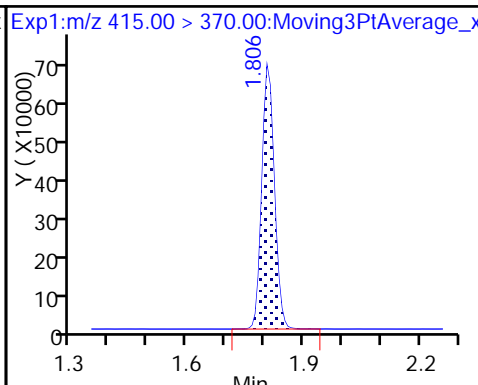
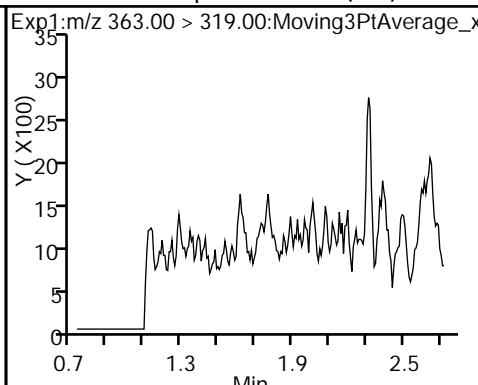
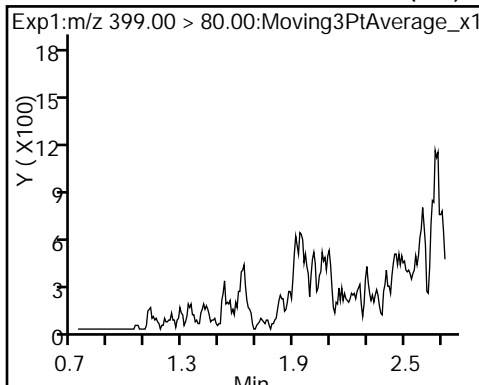
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

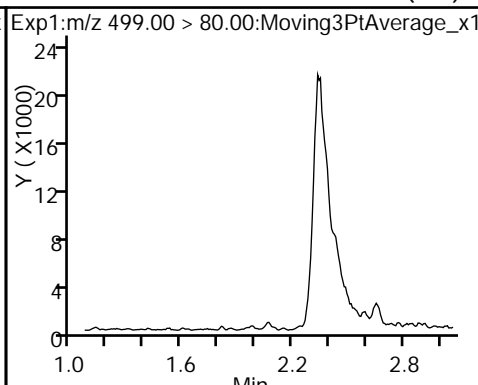
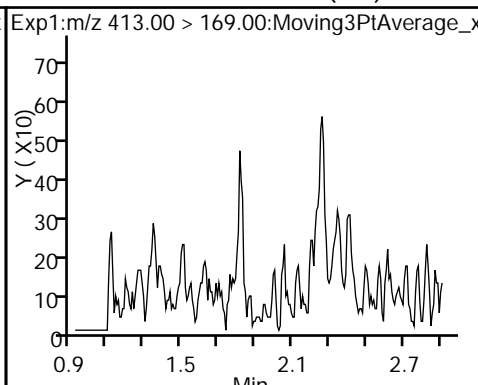
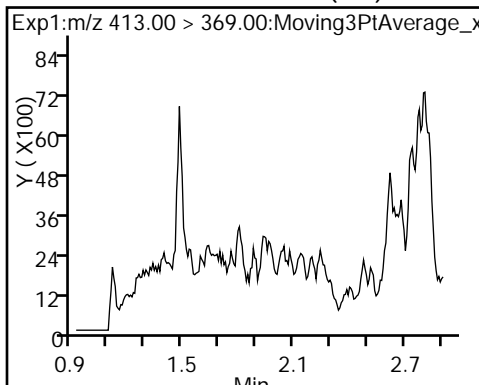
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

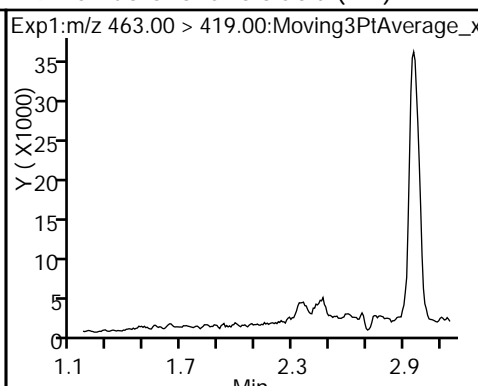
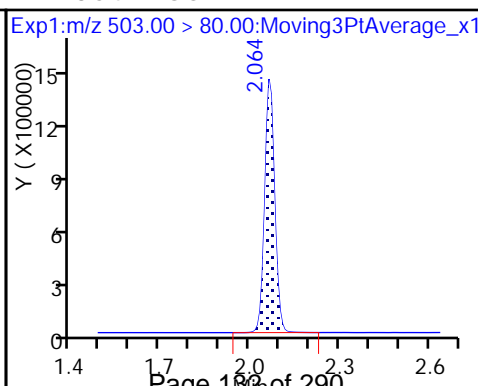
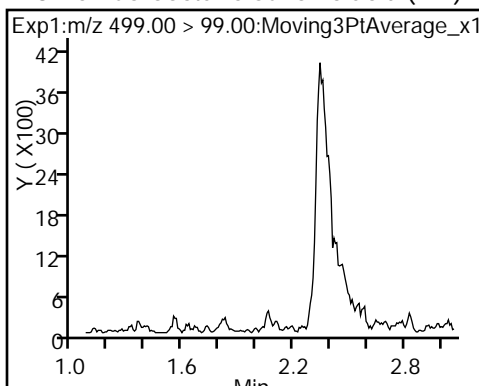
8 Perfluorooctane sulfonic acid (ND)



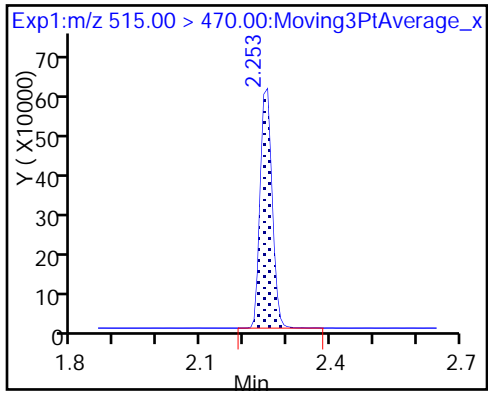
8 Perfluorooctane sulfonic acid (ND)

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_060.d
 Lims ID: 320-34181-A-6-A
 Client ID: NAWC-121117-FRB-040
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:17:58 ALS Bottle#: 42 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-6-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:26:44

| Compound | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0 | 9.18 | 91.79 |
| \$ 10 13C2 PFDA | 10.0 | 9.81 | 98.13 |

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: WGNA-121117-RW-4846 Lab Sample ID: 320-34181-7
 Matrix: Water Lab File ID: 2017.12.19_537A_061.d
 Analysis Method: 537 Date Collected: 12/11/2017 14:10
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 246.8(mL) Date Analyzed: 12/19/2017 21:22
 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.: 200646 Units: ng/L

| CAS NO. | COMPOUND NAME | RESULT | Q | LOQ | LOD | DL |
|-----------|--------------------------------------|--------|-----|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 16 | U M | 41 | 16 | 6.9 |
| 335-67-1 | Perfluorooctanoic acid (PFOA) | 5.3 | J | 20 | 8.1 | 2.8 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 20 | U | 24 | 20 | 8.1 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 12 | U M | 30 | 12 | 5.6 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 4.1 | U M | 10 | 4.1 | 1.9 |
| 375-73-5 | Perfluorobutanesulfonic acid (PFBS) | 36 | U M | 91 | 36 | 16 |

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

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_061.d
 Lims ID: 320-34181-A-7-A
 Client ID: WGNA-121117-RW-4846
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:22:37 ALS Bottle#: 43 Worklist Smp#: 12
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-7-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:28:26

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.366 | 1.444 | -0.078 | 1.000 | 28897 | 0.2349 | | 39.7 | M |
| 298.90 > 99.00 | 1.366 | 1.444 | -0.078 | 1.000 | 22011 | | 1.31(0.00-0.00) | 51.6 | M |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.487 | 1.573 | -0.086 | 1.000 | 1438426 | 8.79 | | 9119 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.631 | 1.725 | -0.094 | 1.000 | 112144 | 0.6093 | | 72.4 | M |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.631 | 1.725 | -0.094 | 1.000 | 43041 | 0.3090 | | 9.6 | M |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.813 | 1.913 | -0.100 | | 1486642 | 10.0 | | 8377 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.813 | 1.914 | -0.101 | 1.000 | 180916 | 1.31 | | 28.0 | |
| 413.00 > 169.00 | 1.813 | 1.914 | -0.101 | 1.000 | 102424 | | 1.77(0.00-0.00) | 277 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 1.973 | 2.071 | -0.098 | 1.000 | 123431 | 1.20 | | 13.6 | M |
| 499.00 > 99.00 | 2.071 | 2.071 | 0.0 | 1.050 | 18168 | | 6.79(0.00-0.00) | 15.2 | M |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.071 | 2.151 | -0.080 | | 3153123 | 28.7 | | 4933 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.253 | 2.312 | -0.059 | 1.000 | 985721 | 8.67 | | 7152 | |

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_061.d

Injection Date: 19-Dec-2017 21:22:37

Instrument ID: A8_N

Lims ID: 320-34181-A-7-A

Lab Sample ID: 320-34181-7

Client ID: WGNA-121117-RW-4846

Operator ID: SACINSTLCMS01

ALS Bottle#: 43

Worklist Smp#: 12

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

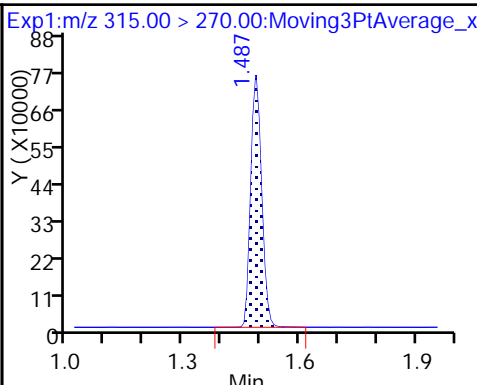
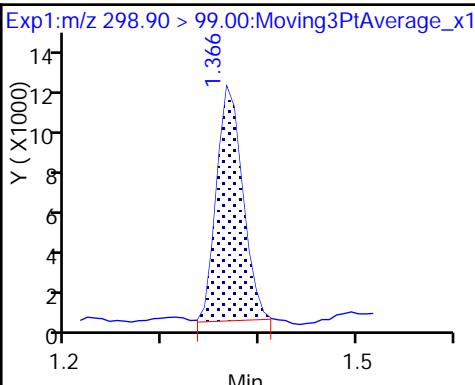
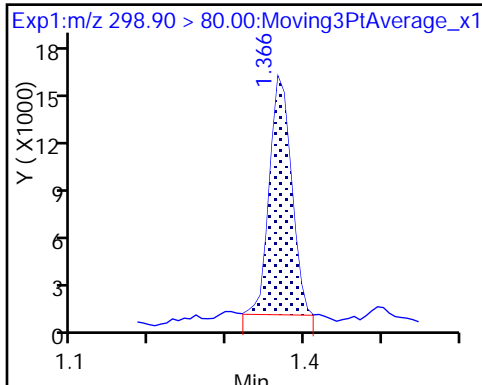
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (M)

1 Perfluorobutanesulfonic acid (M)

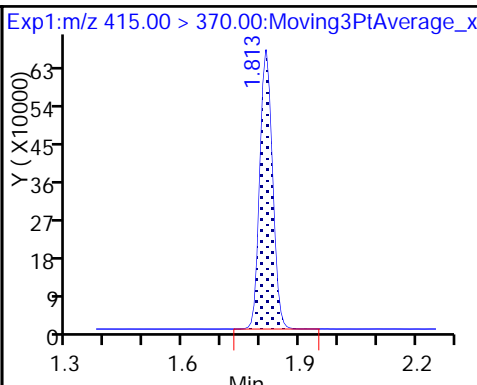
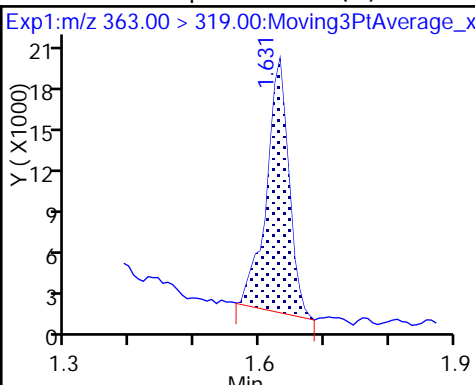
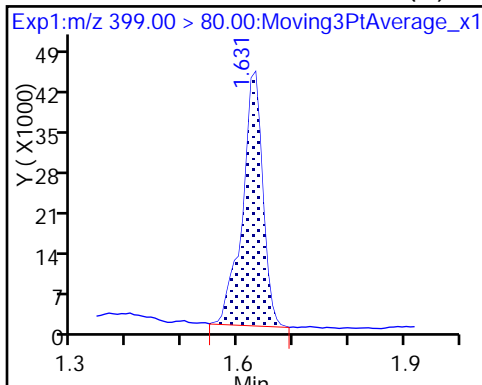
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (M)

4 Perfluoroheptanoic acid (M)

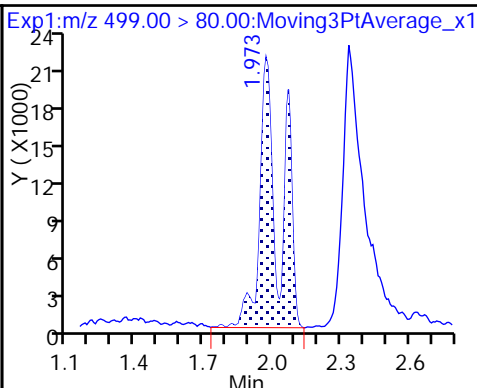
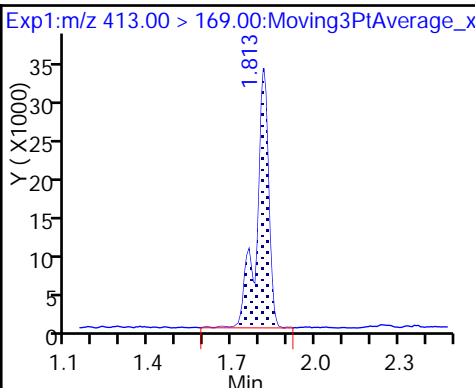
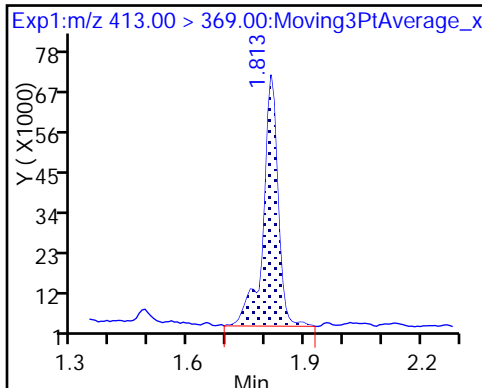
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

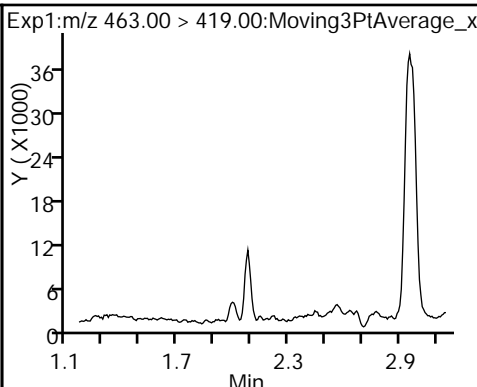
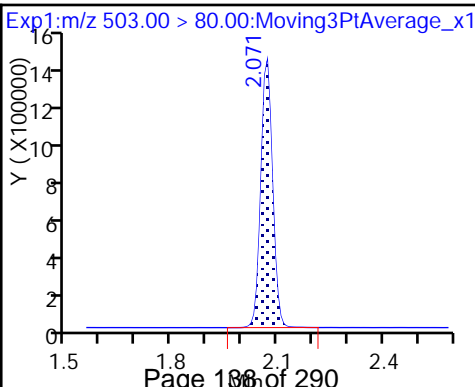
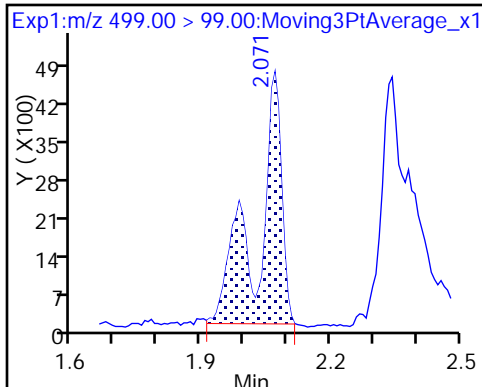
8 Perfluorooctane sulfonic acid



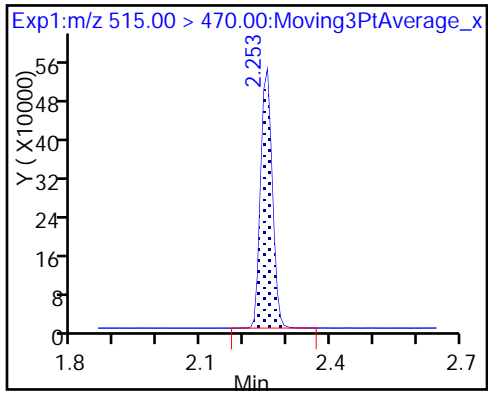
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_061.d
 Lims ID: 320-34181-A-7-A
 Client ID: WGNA-121117-RW-4846
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:22:37 ALS Bottle#: 43 Worklist Smp#: 12
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-7-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:28:26

| Compound | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0 | 8.79 | 87.94 |
| \$ 10 13C2 PFDA | 10.0 | 8.67 | 86.65 |

TestAmerica Sacramento

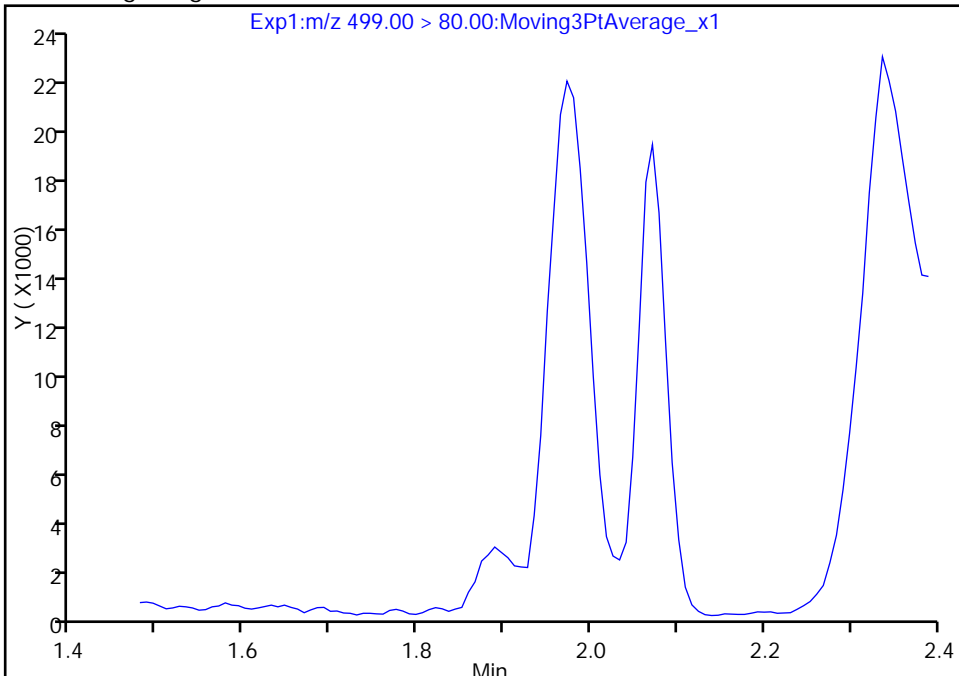
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_061.d
Injection Date: 19-Dec-2017 21:22:37 Instrument ID: A8_N
Lims ID: 320-34181-A-7-A Lab Sample ID: 320-34181-7
Client ID: WGNA-121117-RW-4846
Operator ID: SACINSTLCMS01 ALS Bottle#: 43 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

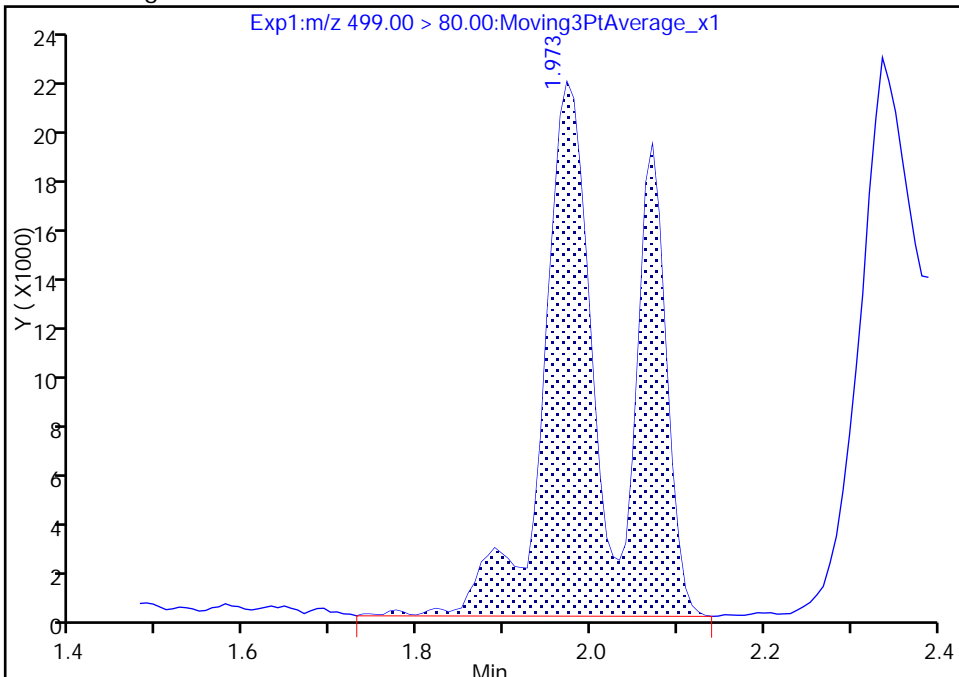
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 1.97
Area: 123431
Amount: 1.195696
Amount Units: ng/ml



TestAmerica Sacramento

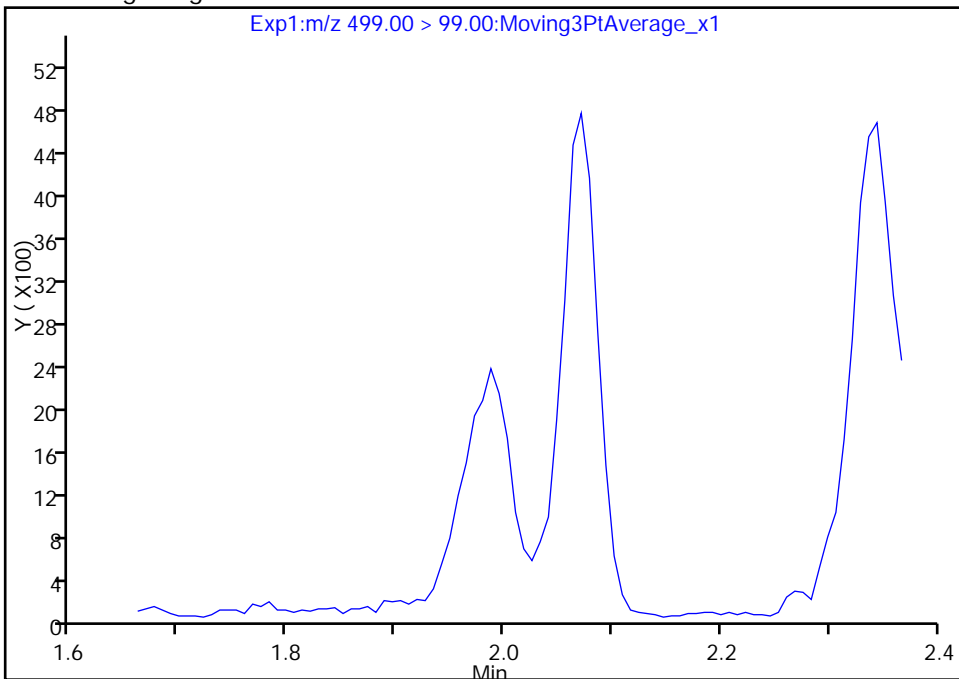
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_061.d
Injection Date: 19-Dec-2017 21:22:37 Instrument ID: A8_N
Lims ID: 320-34181-A-7-A Lab Sample ID: 320-34181-7
Client ID: WGNA-121117-RW-4846
Operator ID: SACINSTLCMS01 ALS Bottle#: 43 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

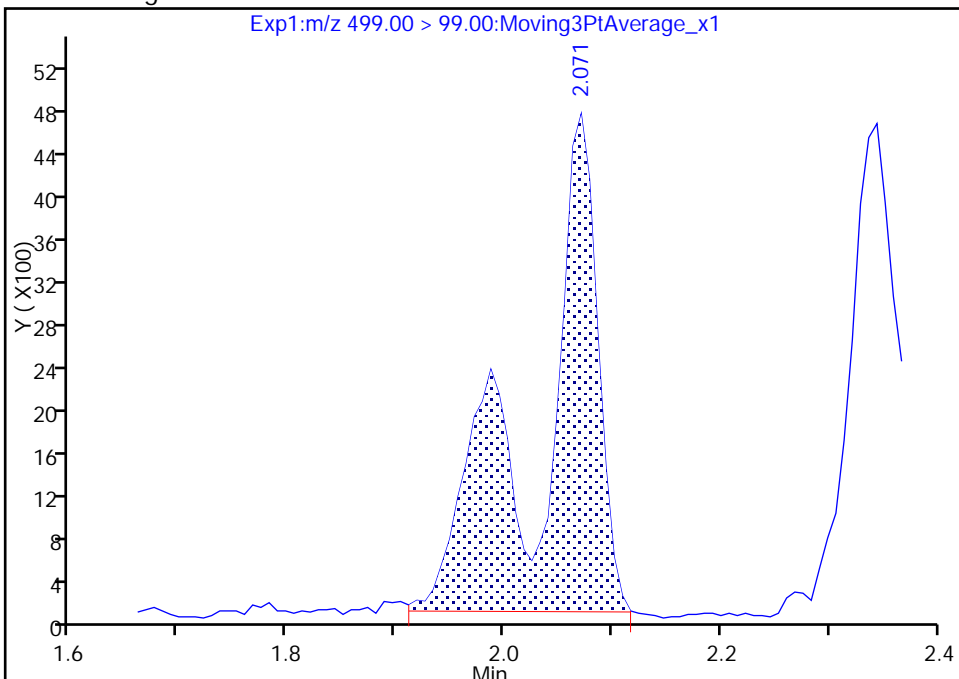
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 18168
Amount: 1.195696
Amount Units: ng/ml



TestAmerica Sacramento

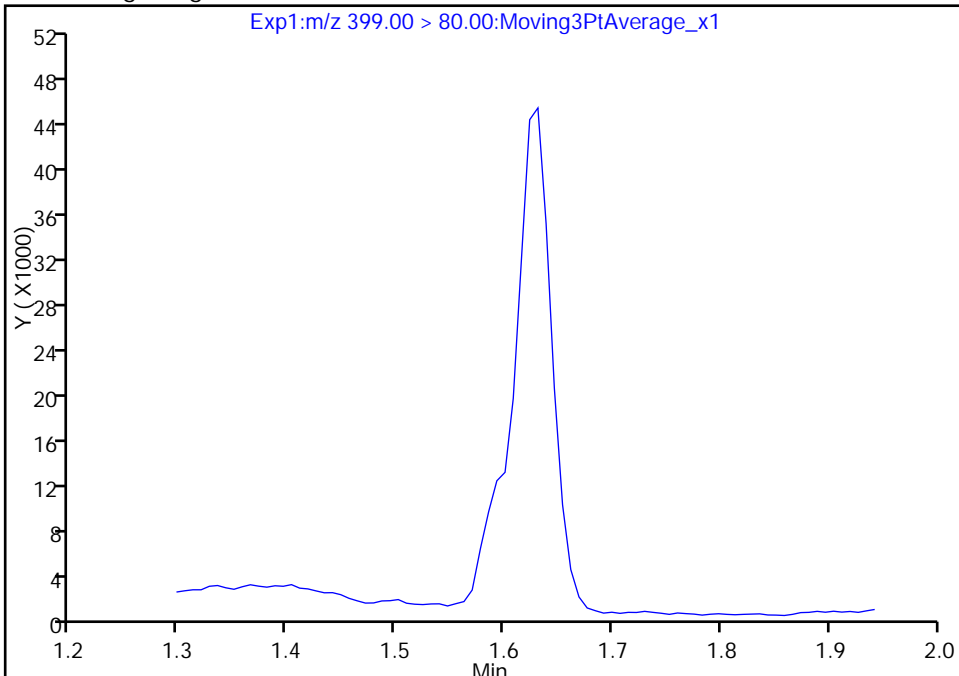
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_061.d
Injection Date: 19-Dec-2017 21:22:37 Instrument ID: A8_N
Lims ID: 320-34181-A-7-A Lab Sample ID: 320-34181-7
Client ID: WGNA-121117-RW-4846
Operator ID: SACINSTLCMS01 ALS Bottle#: 43 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

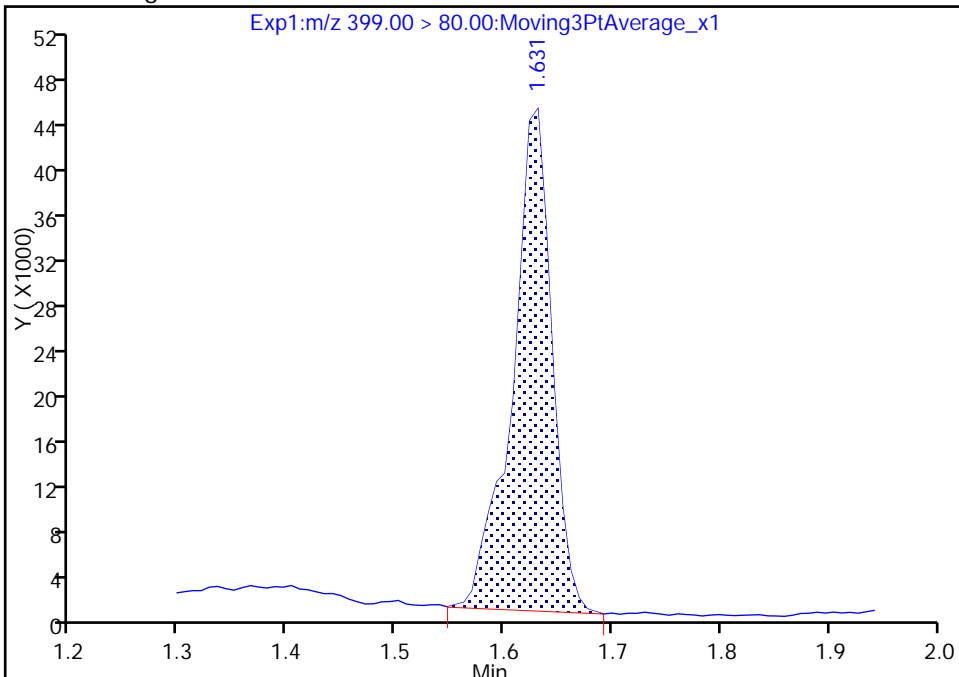
Not Detected
Expected RT: 1.72

Processing Integration Results



Manual Integration Results

RT: 1.63
Area: 112144
Amount: 0.609296
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:27:22
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

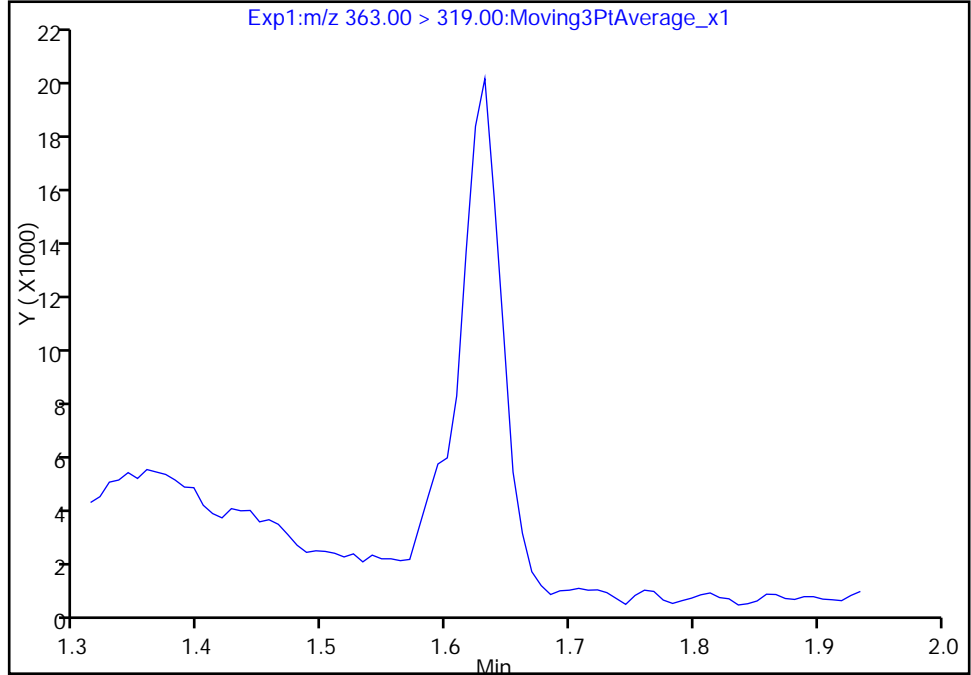
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_061.d
Injection Date: 19-Dec-2017 21:22:37 Instrument ID: A8_N
Lims ID: 320-34181-A-7-A Lab Sample ID: 320-34181-7
Client ID: WGNA-121117-RW-4846
Operator ID: SACINSTLCMS01 ALS Bottle#: 43 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

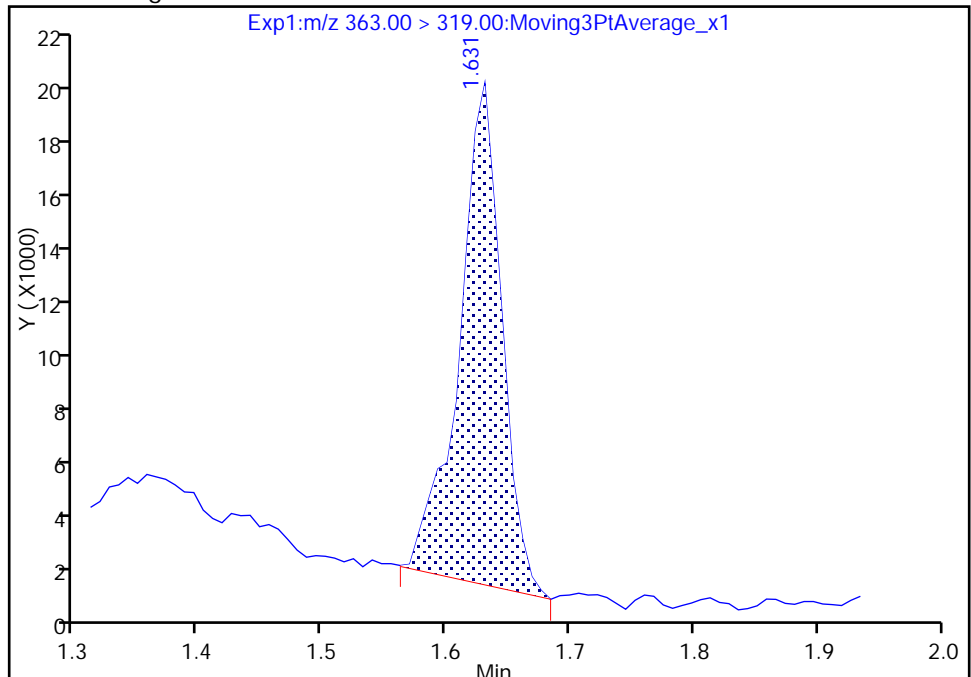
Not Detected
Expected RT: 1.72

Processing Integration Results



Manual Integration Results

RT: 1.63
Area: 43041
Amount: 0.309012
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:27:33
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

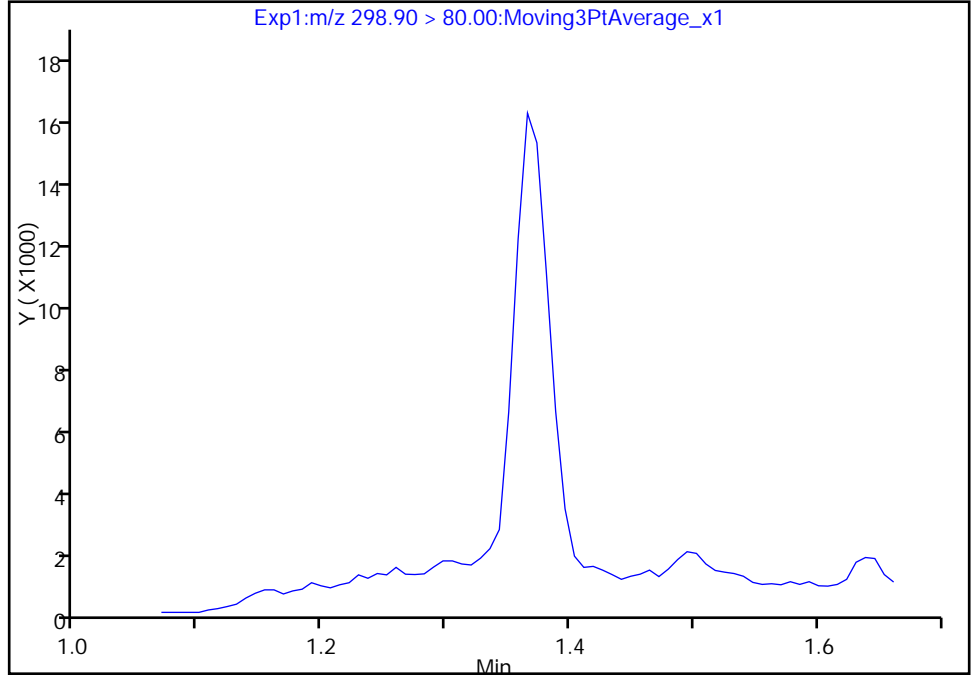
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_061.d
Injection Date: 19-Dec-2017 21:22:37 Instrument ID: A8_N
Lims ID: 320-34181-A-7-A Lab Sample ID: 320-34181-7
Client ID: WGNA-121117-RW-4846
Operator ID: SACINSTLCMS01 ALS Bottle#: 43 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

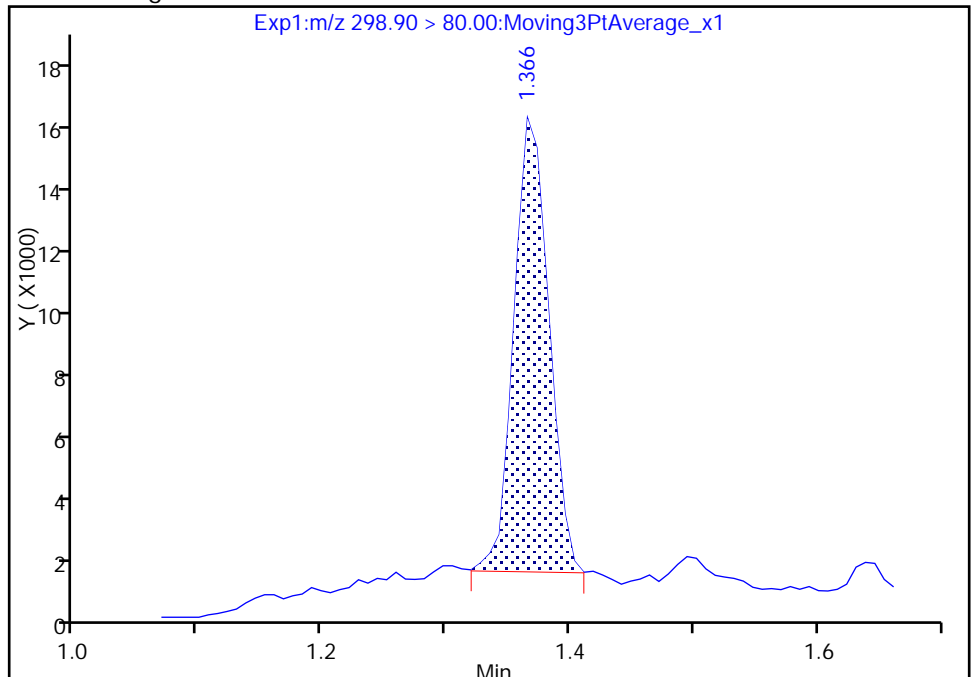
Not Detected
Expected RT: 1.44

Processing Integration Results



Manual Integration Results

RT: 1.37
Area: 28897
Amount: 0.234899
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:27:01
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

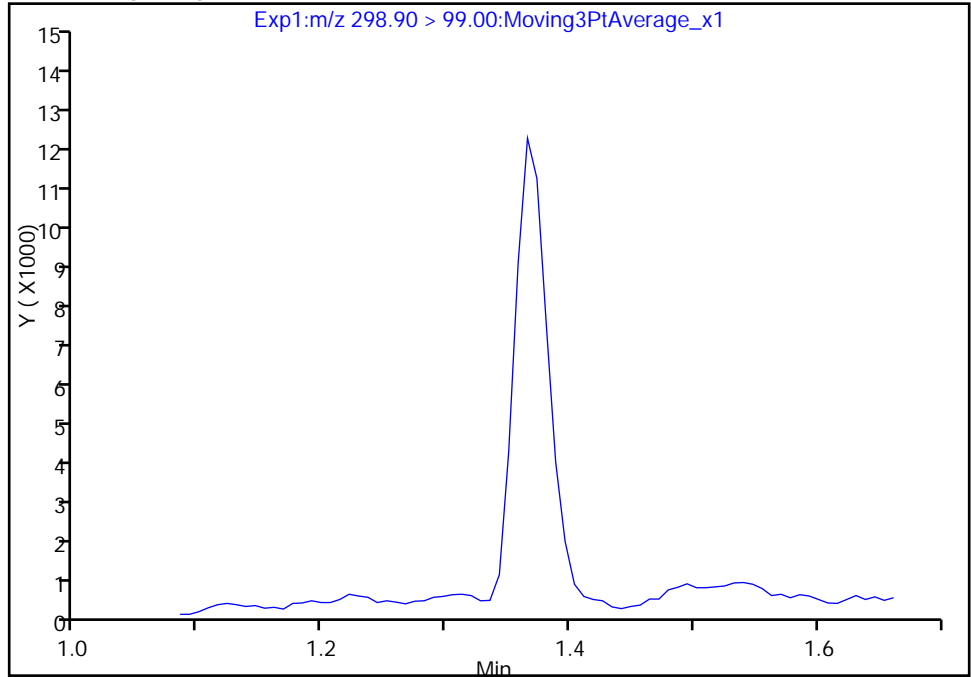
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_061.d
Injection Date: 19-Dec-2017 21:22:37 Instrument ID: A8_N
Lims ID: 320-34181-A-7-A Lab Sample ID: 320-34181-7
Client ID: WGNA-121117-RW-4846
Operator ID: SACINSTLCMS01 ALS Bottle#: 43 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

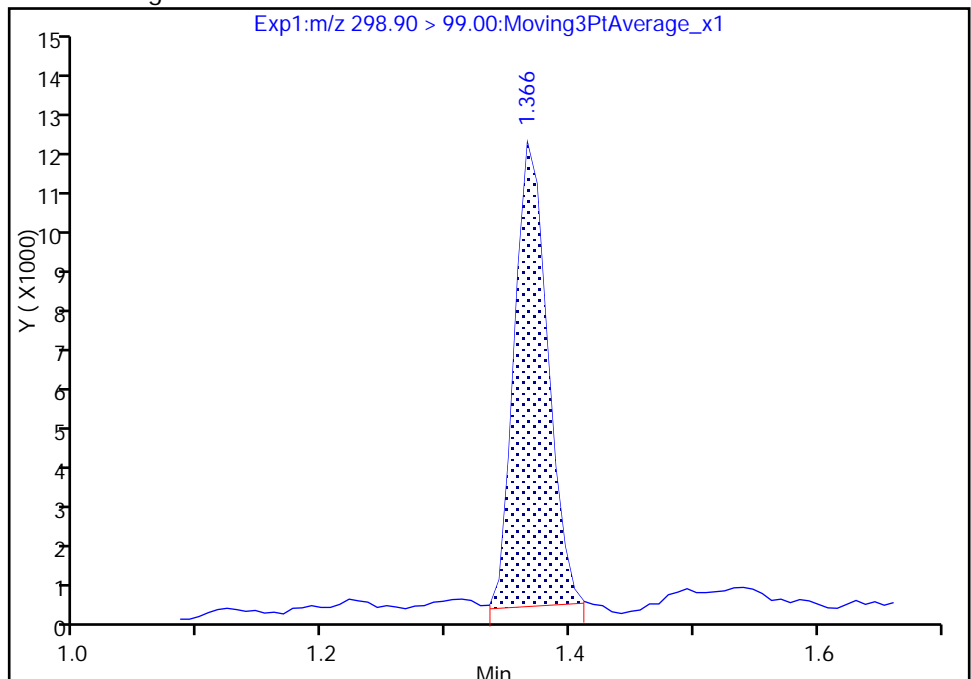
Not Detected
Expected RT: 1.44

Processing Integration Results



Manual Integration Results

RT: 1.37
Area: 22011
Amount: 0.234899
Amount Units: ng/ml



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: WGNA-121117-FRB-4846 Lab Sample ID: 320-34181-8
 Matrix: Water Lab File ID: 2017.12.19_537A_064.d
 Analysis Method: 537 Date Collected: 12/11/2017 14:05
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 250.3(mL) Date Analyzed: 12/19/2017 21:36
 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.: 200767 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 | 91 | | 70-130 |
| STL00996 | 13C2 PFDA | 98 | | 70-130 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_064.d
 Lims ID: 320-34181-A-8-A
 Client ID: WGNA-121117-FRB-4846
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:36:39 ALS Bottle#: 44 Worklist Smp#: 15
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-8-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:31 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:29:02

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|-----------------|-----------------|--------|--------|--------|----------|--------------|---------------|------|-------|
| \$ 2 13C2 PFHxA | 315.00 > 270.00 | 1.487 | 1.573 | -0.086 | 1.000 | 1528855 | 9.14 | 9579 | |
| * 6 13C2-PFOA | 415.00 > 370.00 | 1.813 | 1.913 | -0.100 | | 1519488 | 10.0 | 7212 | |
| * 7 13C4 PFOS | 503.00 > 80.00 | 2.071 | 2.151 | -0.080 | | 3290304 | 28.7 | 8939 | |
| \$ 10 13C2 PFDA | 515.00 > 470.00 | 2.253 | 2.312 | -0.059 | 1.000 | 1144304 | 9.84 | 9708 | |

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_064.d

Injection Date: 19-Dec-2017 21:36:39

Instrument ID: A8_N

Lims ID: 320-34181-A-8-A

Lab Sample ID: 320-34181-8

Client ID: WGNA-121117-FRB-4846

Operator ID: SACINSTLCMS01

ALS Bottle#: 44

Worklist Smp#: 15

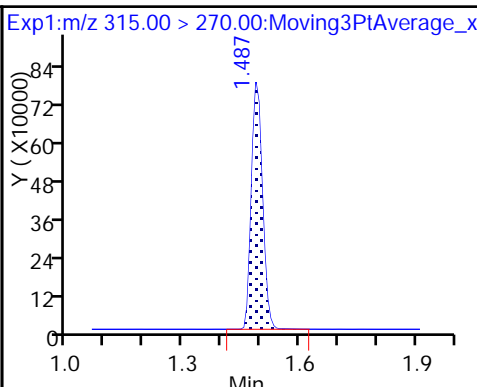
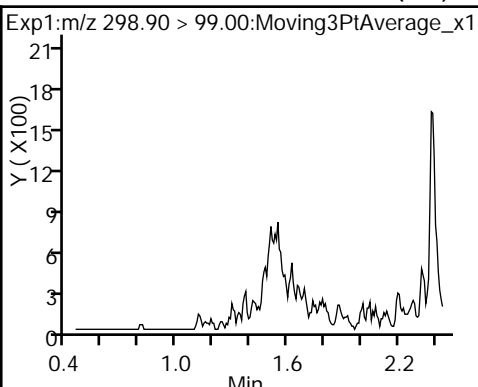
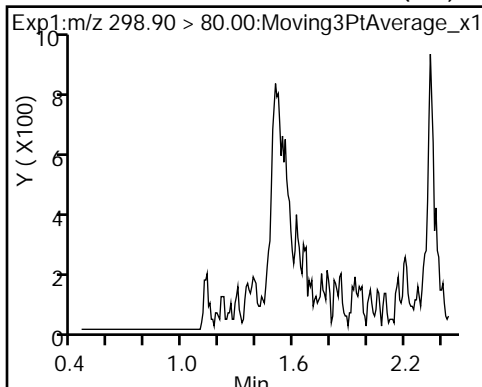
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

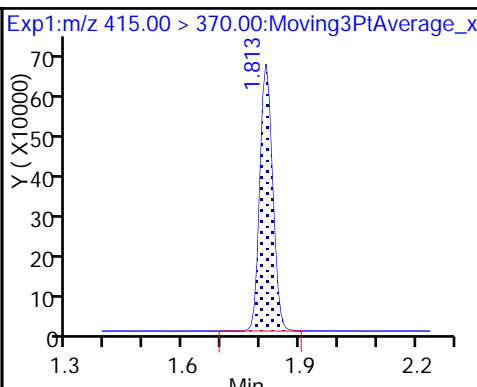
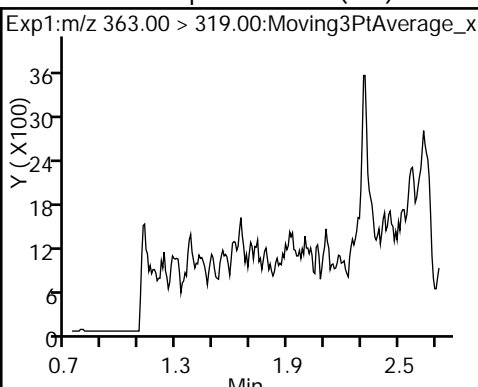
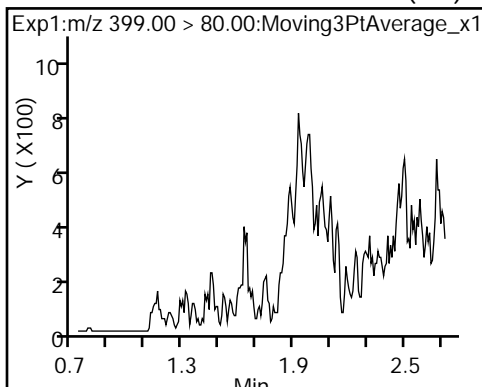
Method: 537_A8_N

Limit Group: LC 537 ICAL

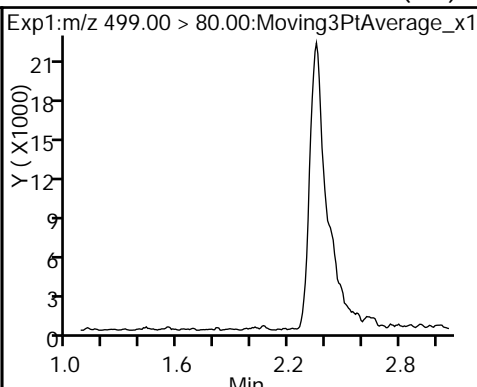
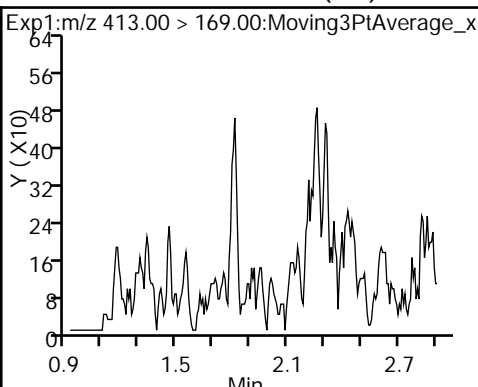
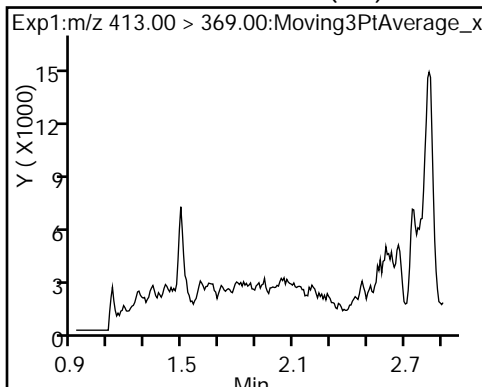
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



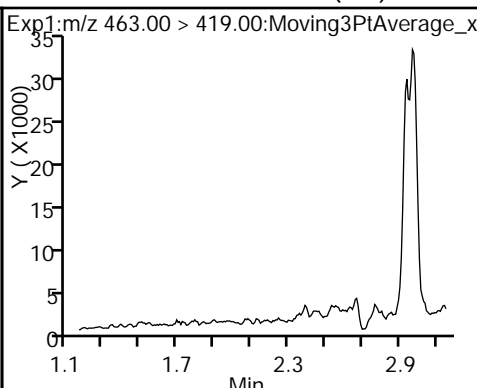
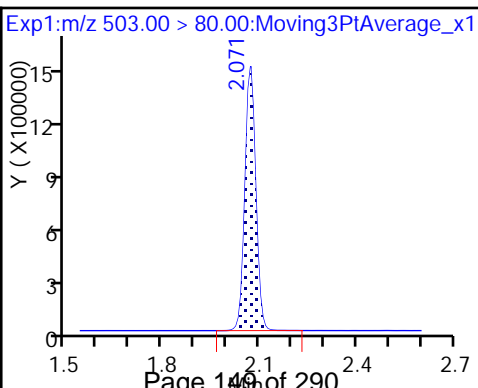
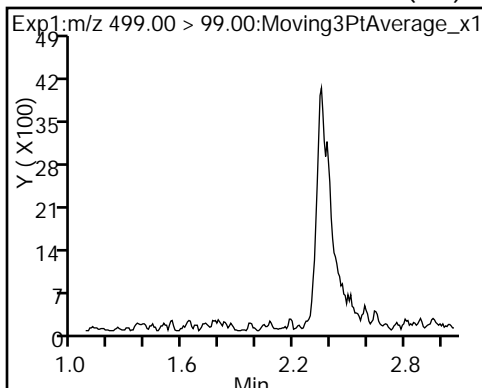
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



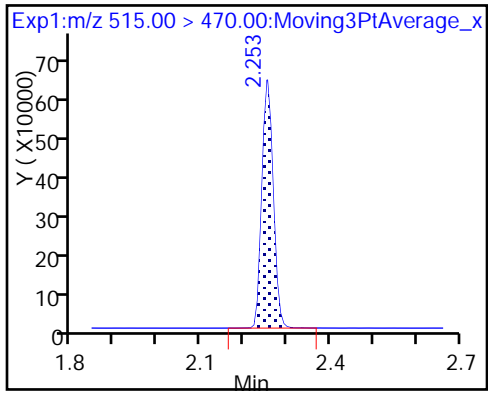
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) 8 Perfluorooctane sulfonic acid (ND)



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



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_064.d
 Lims ID: 320-34181-A-8-A
 Client ID: WGNA-121117-FRB-4846
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:36:39 ALS Bottle#: 44 Worklist Smp#: 15
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-8-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:31 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:29:02

| Compound | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0 | 9.14 | 91.45 |
| \$ 10 13C2 PFDA | 10.0 | 9.84 | 98.42 |

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: WGNA-121117-DUP14 Lab Sample ID: 320-34181-9
 Matrix: Water Lab File ID: 2017.12.19_537A_065.d
 Analysis Method: 537 Date Collected: 12/11/2017 07:00
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 245.8 (mL) Date Analyzed: 12/19/2017 21:41
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200767 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) | 12 | J | 20 | 8.1 | 2.8 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 20 | U | 24 | 20 | 8.1 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 7.6 | J | 31 | 12 | 5.6 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 5.3 | 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 | 96 | | 70-130 |
| STL00996 | 13C2 PFDA | 90 | | 70-130 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_065.d
 Lims ID: 320-34181-A-9-A
 Client ID: WGNA-121117-DUP14
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:41:19 ALS Bottle#: 45 Worklist Smp#: 16
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-9-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:31 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:29:28

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.366 | 1.444 | -0.078 | 1.000 | 136418 | 1.10 | | 297 | |
| 298.90 > 99.00 | 1.366 | 1.444 | -0.078 | 1.000 | 97733 | | 1.40(0.00-0.00) | 220 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.479 | 1.573 | -0.094 | 1.000 | 1652560 | 9.60 | | 9873 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.624 | 1.725 | -0.101 | 1.000 | 349113 | 1.87 | | 344 | |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.624 | 1.725 | -0.101 | 1.000 | 192039 | 1.31 | | 48.5 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.806 | 1.913 | -0.107 | | 1565140 | 10.0 | | 8827 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.806 | 1.914 | -0.108 | 1.000 | 419792 | 2.90 | | 58.7 | |
| 413.00 > 169.00 | 1.806 | 1.914 | -0.108 | 1.000 | 267562 | | 1.57(0.00-0.00) | 556 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.064 | 2.071 | -0.007 | 1.000 | 154643 | 1.48 | | 16.7 | |
| 499.00 > 99.00 | 2.064 | 2.071 | -0.007 | 1.000 | 25895 | | 5.97(0.00-0.00) | 24.7 | |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.064 | 2.151 | -0.087 | | 3193781 | 28.7 | | 5674 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.253 | 2.312 | -0.059 | 1.000 | 1072623 | 8.96 | | 8853 | |

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_065.d

Injection Date: 19-Dec-2017 21:41:19

Instrument ID: A8_N

Lims ID: 320-34181-A-9-A

Lab Sample ID: 320-34181-9

Client ID: WGNA-121117-DUP14

Operator ID: SACINSTLCMS01

ALS Bottle#: 45

Worklist Smp#: 16

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

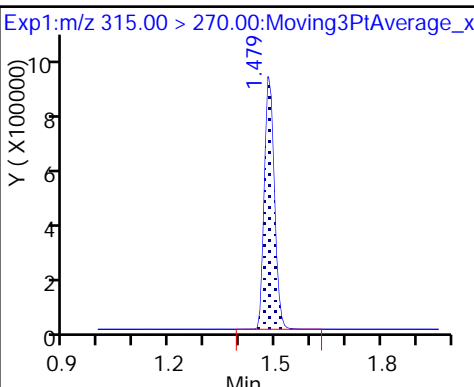
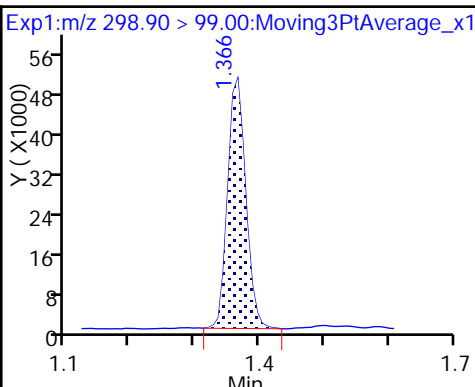
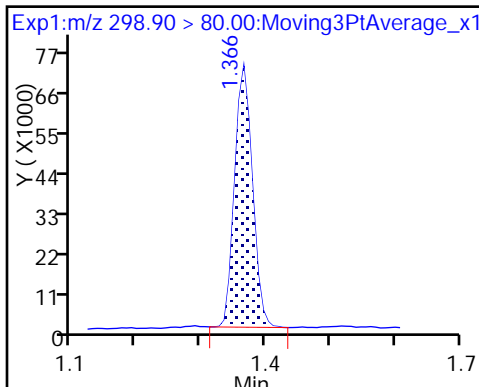
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

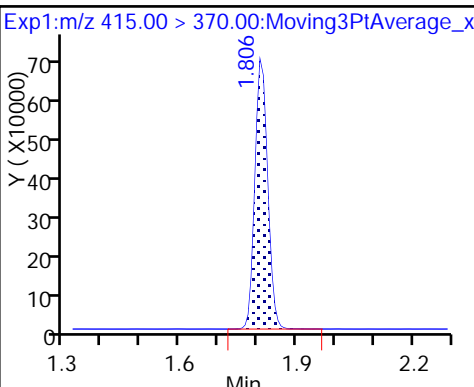
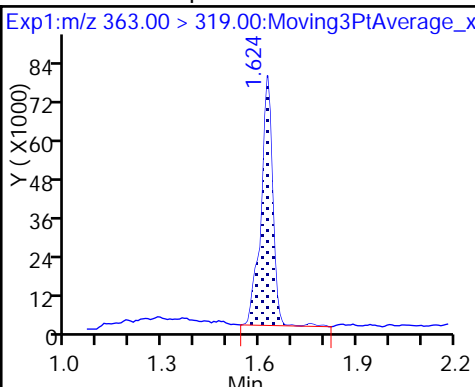
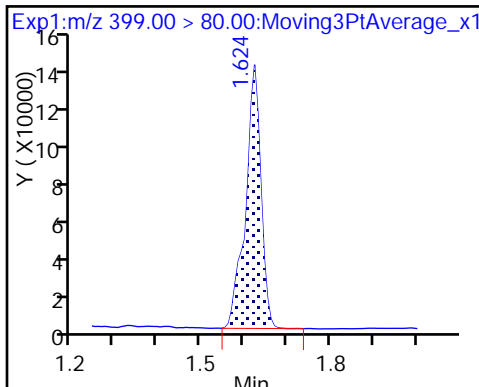
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

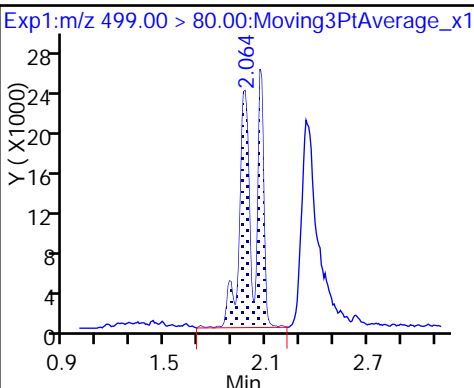
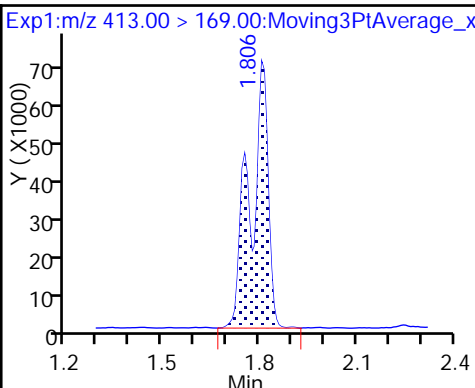
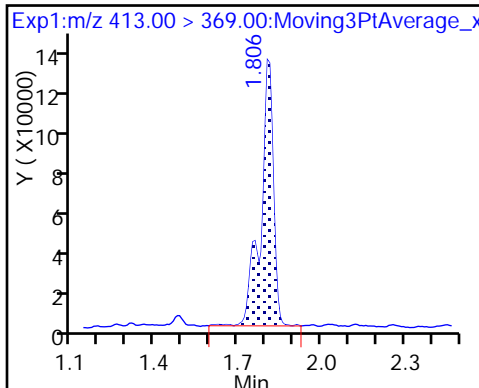
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

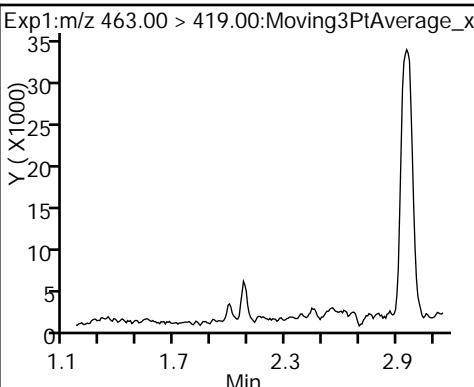
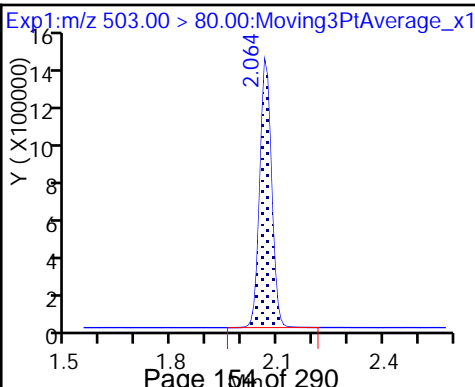
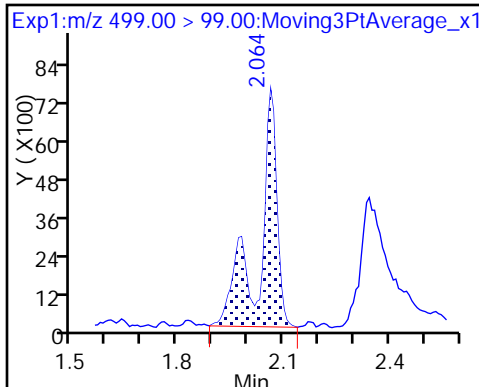
8 Perfluorooctane sulfonic acid



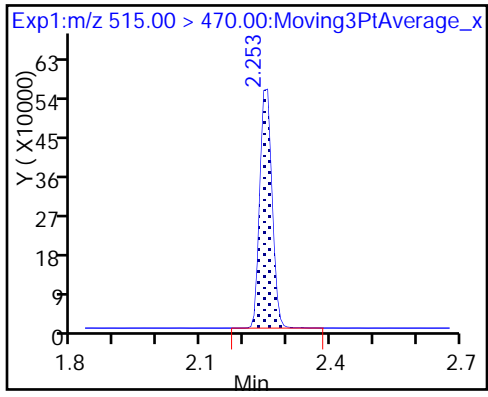
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_065.d
 Lims ID: 320-34181-A-9-A
 Client ID: WGNA-121117-DUP14
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:41:19 ALS Bottle#: 45 Worklist Smp#: 16
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34181-a-9-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:31 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:29:28

| Compound | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0 | 9.60 | 95.96 |
| \$ 10 13C2 PFDA | 10.0 | 8.96 | 89.56 |

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

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1 Analy Batch No.: 192908

SDG No.: _____

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

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

Calibration Files:

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

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

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

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

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1 Analy Batch No.: 192908

SDG No.: _____

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

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

Calibration Files:

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

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

Curve Type Legend:

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

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

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1 Analy Batch No.: 192908

SDG No.: _____

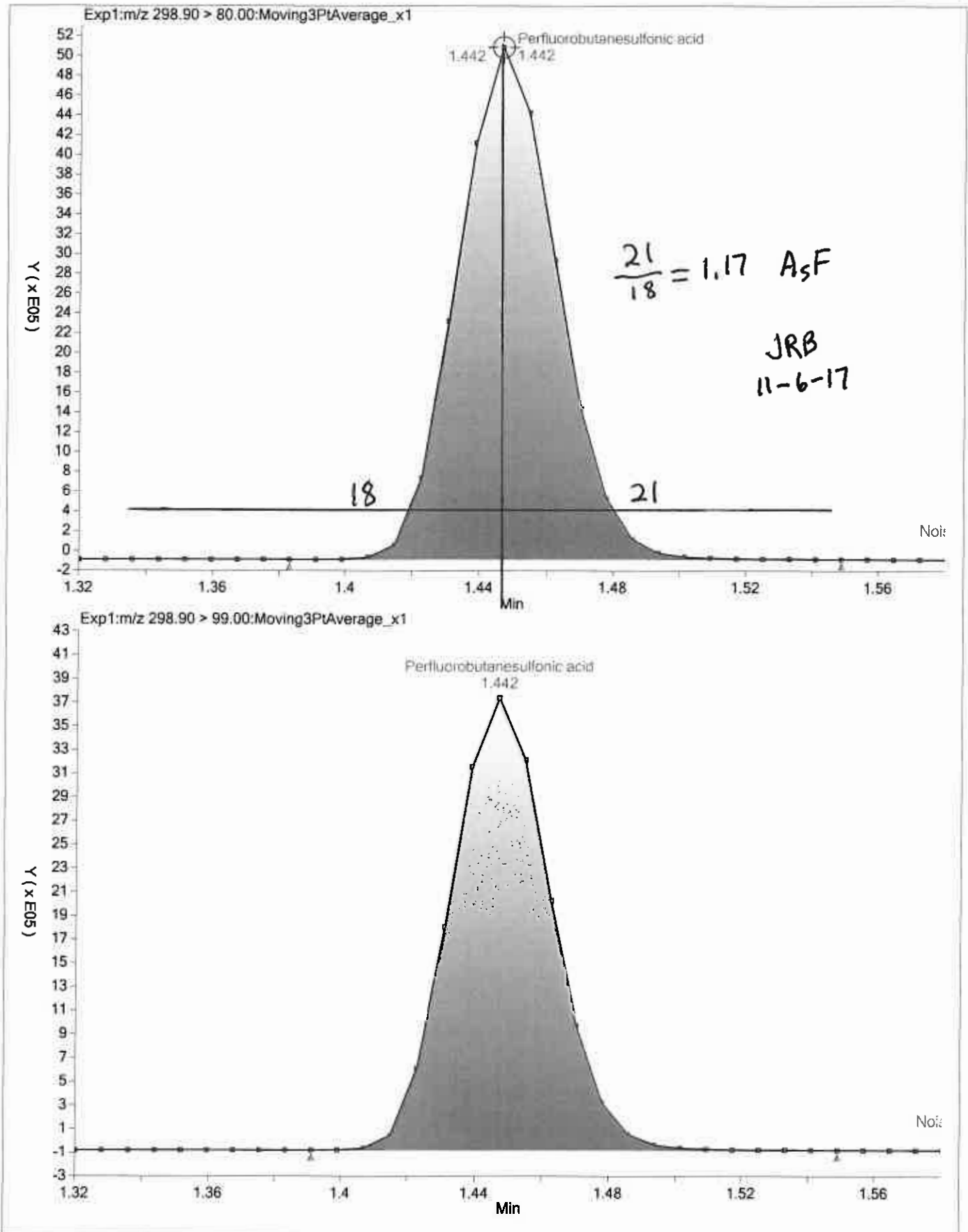
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3 (mm) Heated Purge: (Y/N) N

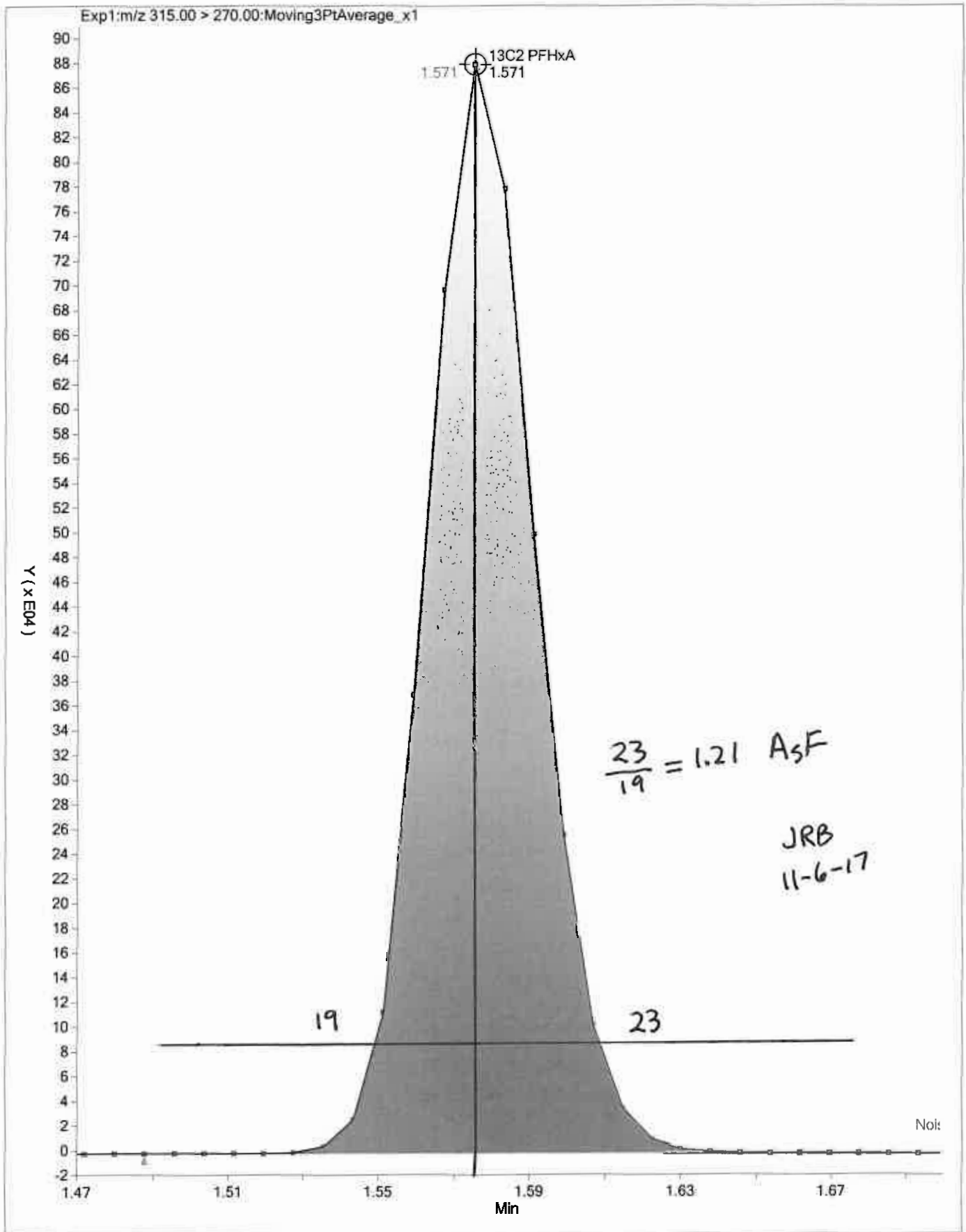
Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

Calibration Files:

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

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





TestAmerica Laboratories
Istd/Surrogate Recovery Report

Worklist Name: 03NOV2017_537A_ICAL

Worklist Num: 49975

Instrument: A8_N

Method: 537_A8_N

Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b

Limit Group: LC 537 ICAL

Analysis Type: SemiVOA

Inj Volume: 2.00

Inj Vol Units: ul

Lims Batch: 192908

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

Non-Cal IS Mode: Last Ccal Sample

\$ 2 13C2 PFHxA

\$ 10 13C2 PFDA

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

13C2-PFOA

$$RPD = \frac{1623614 - 1426806}{\left(\frac{1623614 + 1426806}{2}\right)} (100) = 12.9$$

13C4-PFOS

$$RPD = \frac{3450592 - 3141787}{\left(\frac{3450592 + 3141787}{2}\right)} (100) = 9.37$$

JRB
11-6-17

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_004.d
 Lims ID: IC L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 03-Nov-2017 13:37:59 ALS Bottle#: 1 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L1_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Nov-2017 15:52:07 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:18:01

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.449 | 1.444 | 0.005 | 1.000 | 1076553 | 8.46 | | 654 | |
| 298.90 > 99.00 | 1.449 | 1.444 | 0.005 | 1.000 | 763262 | | 1.41(0.00-0.00) | 2025 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.578 | 1.573 | 0.005 | 1.000 | 1655691 | 9.90 | | 8732 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.730 | 1.725 | 0.005 | 1.000 | 568156 | 2.95 | | 1122 | |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.730 | 1.725 | 0.005 | 1.000 | 143455 | 1.01 | | 42.2 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.920 | 1.913 | 0.007 | | 1520258 | 10.0 | | 6863 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.920 | 1.914 | 0.006 | 1.000 | 296934 | 2.11 | | 53.5 | |
| 413.00 > 169.00 | 1.920 | 1.914 | 0.006 | 1.000 | 149720 | | 1.98(0.00-0.00) | 184 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.155 | 2.147 | 0.008 | 1.000 | 412315 | 3.82 | | 235 | M |
| 499.00 > 99.00 | 2.155 | 2.147 | 0.008 | 1.000 | 85347 | | 4.83(0.00-0.00) | 209 | M |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.155 | 2.151 | 0.004 | | 3298877 | 28.7 | | 5279 | |
| 9 Perfluorononanoic acid | | | | | | | | | |
| 463.00 > 419.00 | 2.162 | 2.158 | 0.004 | 1.000 | 201053 | 1.99 | | 67.8 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.314 | 2.312 | 0.002 | 1.000 | 1177922 | 10.1 | | 7012 | |

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L1_00020

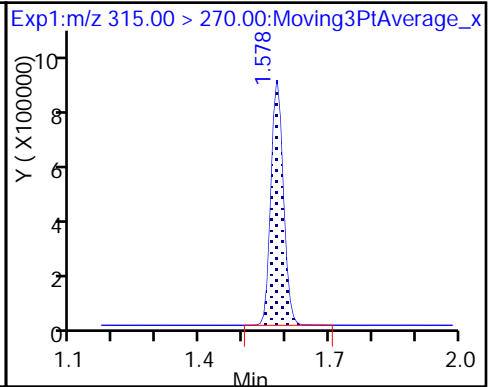
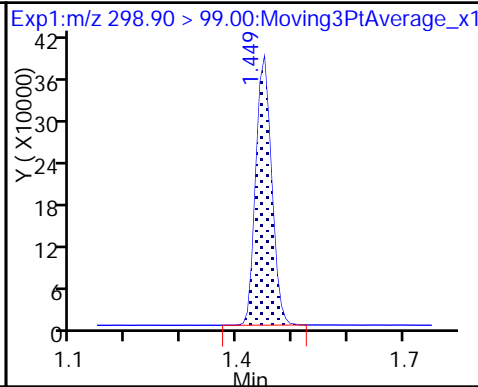
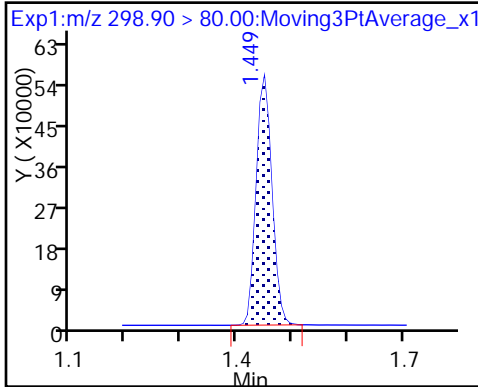
Amount Added: 1.00

Units: mL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

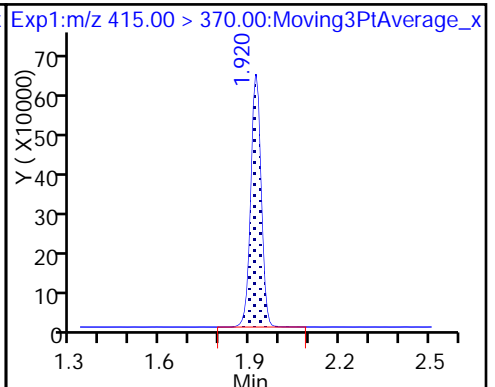
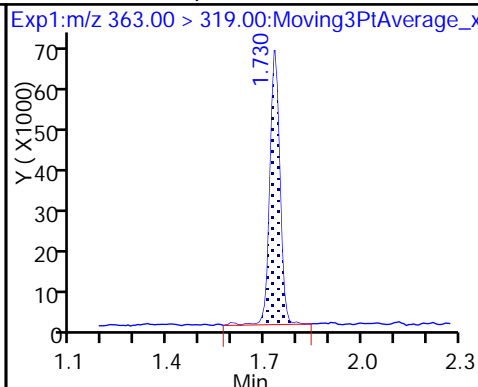
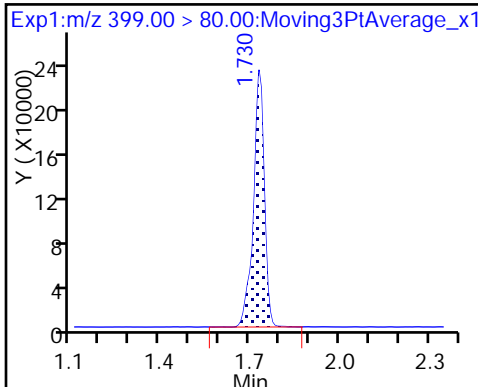
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

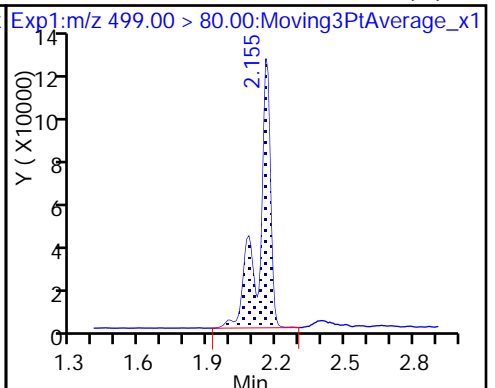
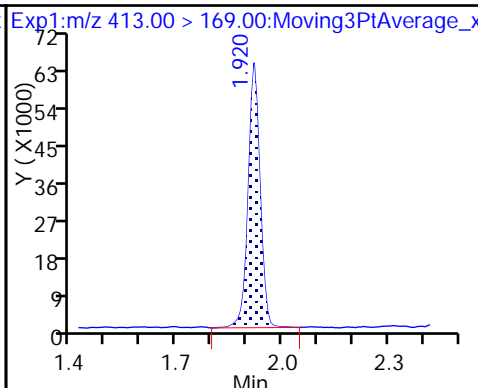
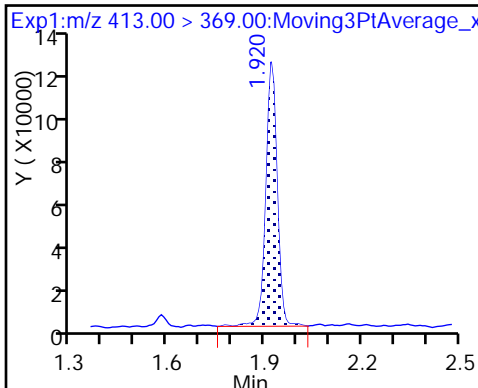
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

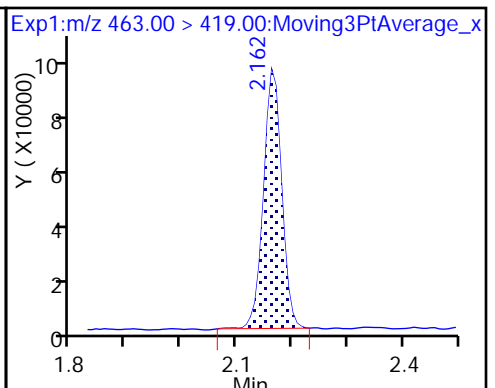
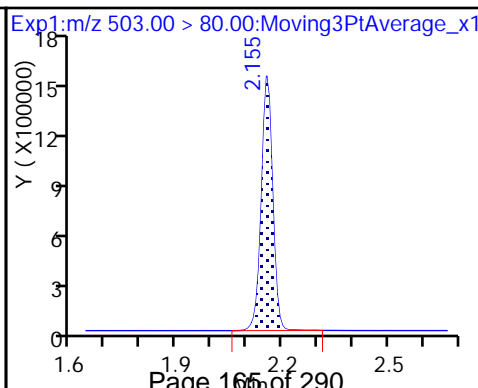
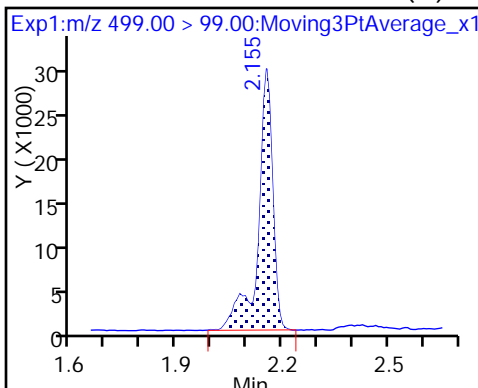
8 Perfluorooctane sulfonic acid (M)



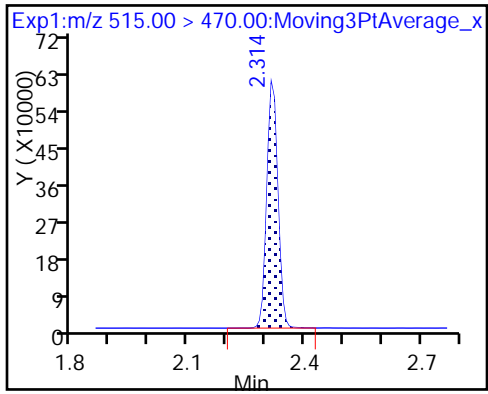
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

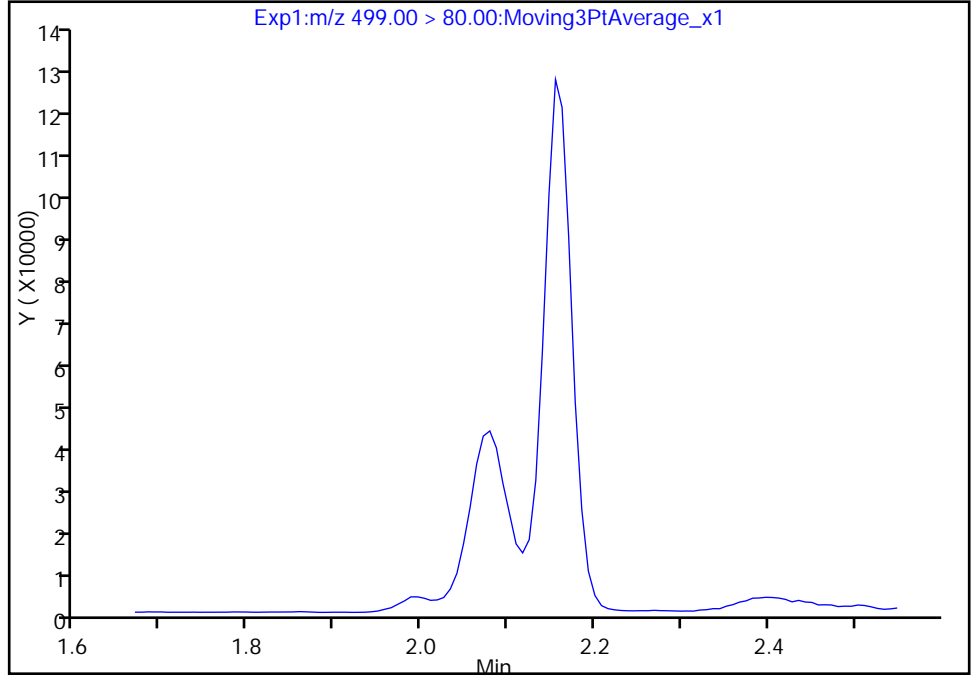
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_004.d
Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: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

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

Signal: 1

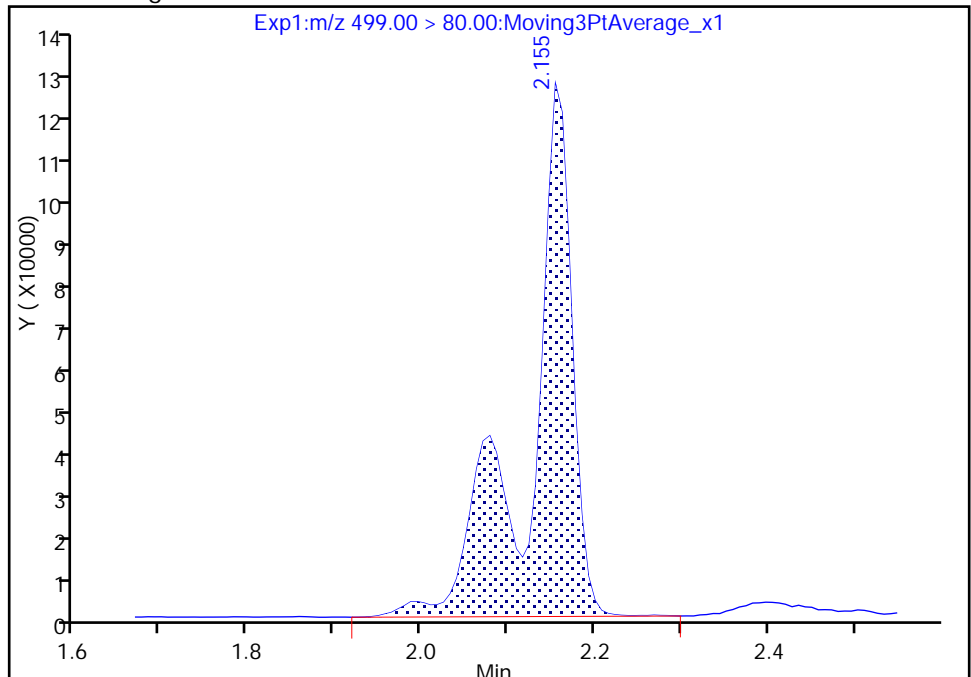
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

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



TestAmerica Sacramento

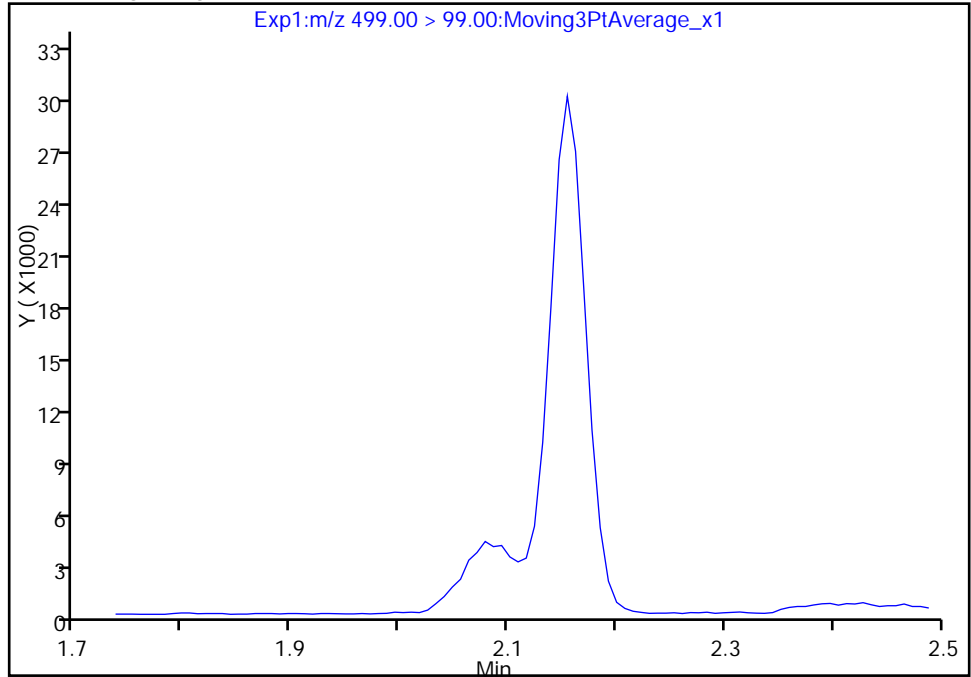
Data File: \\ChromNa\Sacramento\ChromData\A8_N\201711106-49975.b\2017.11.03_537XICAL_004.d
Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

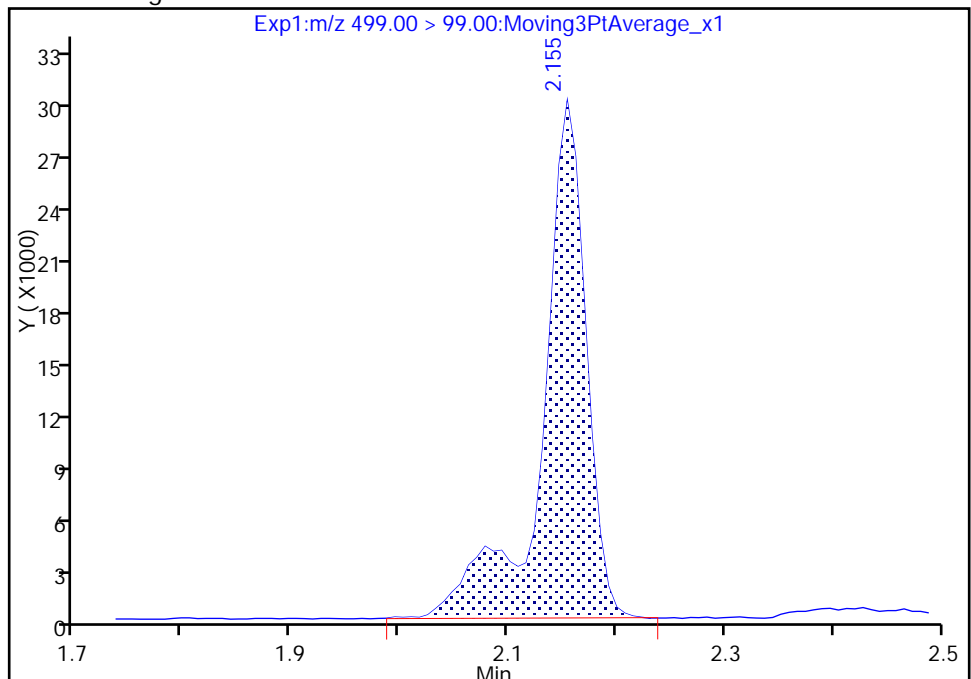
Not Detected
Expected RT: 2.15

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

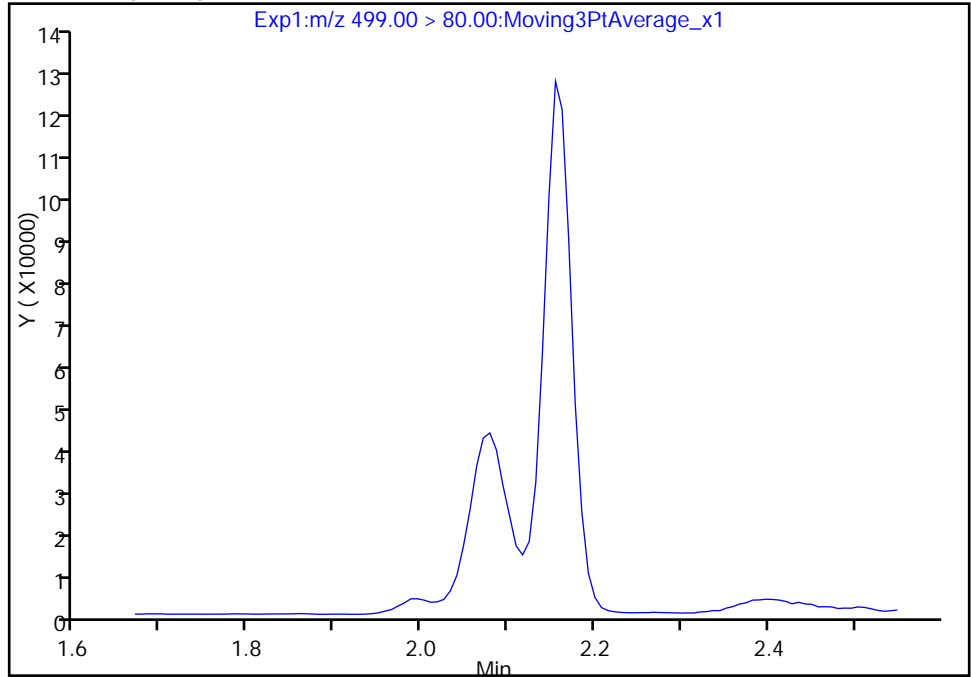
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Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

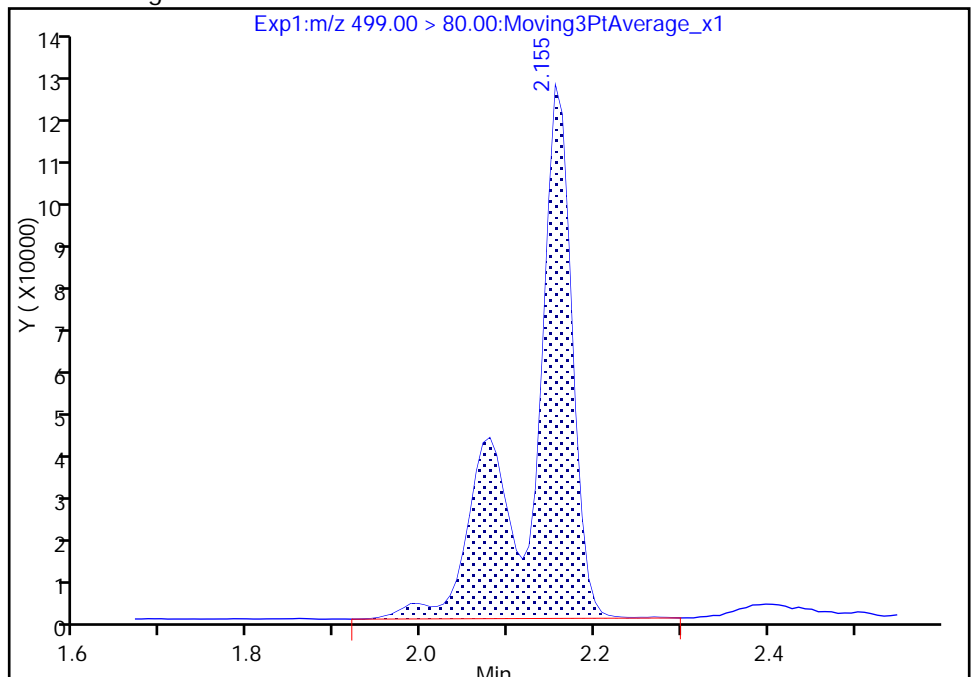
Not Detected
Expected RT: 2.15

Processing Integration Results



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

Manual Integration Results



Reviewer: phomsophat, 06-Nov-2017 07:17:37

Audit Action: Manually Integrated

Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_005.d
 Lims ID: IC L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 03-Nov-2017 13:42:39 ALS Bottle#: 2 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L2_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Nov-2017 15:52:08 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:18:56

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.449 | 1.444 | 0.005 | 1.000 | 2591121 | 19.8 | | 1479 | |
| 298.90 > 99.00 | 1.442 | 1.444 | -0.002 | 0.995 | 1874928 | | 1.38(0.00-0.00) | 4315 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.578 | 1.573 | 0.005 | 1.000 | 1708988 | 9.57 | | 8562 | |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.730 | 1.725 | 0.005 | 1.000 | 331548 | 2.18 | | 87.8 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.730 | 1.725 | 0.005 | 1.000 | 1312135 | 6.51 | | 2317 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.920 | 1.913 | 0.007 | | 1623614 | 10.0 | | 6970 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.920 | 1.914 | 0.006 | 1.000 | 644149 | 4.29 | | 113 | |
| 413.00 > 169.00 | 1.920 | 1.914 | 0.006 | 1.000 | 329479 | | 1.96(0.00-0.00) | 459 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.155 | 2.147 | 0.008 | 1.000 | 985487 | 8.72 | | 578 | M |
| 499.00 > 99.00 | 2.155 | 2.147 | 0.008 | 1.000 | 200739 | | 4.91(0.00-0.00) | 449 | M |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.155 | 2.151 | 0.004 | | 3450592 | 28.7 | | 5334 | |
| 9 Perfluorononanoic acid | | | | | | | | | |
| 463.00 > 419.00 | 2.162 | 2.158 | 0.004 | 1.000 | 453612 | 4.21 | | 136 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.314 | 2.312 | 0.002 | 1.000 | 1184358 | 9.53 | | 7573 | |

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00020

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537ICAL_005.d

Injection Date: 03-Nov-2017 13:42:39

Instrument ID: A8_N

Lims ID: IC L2

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

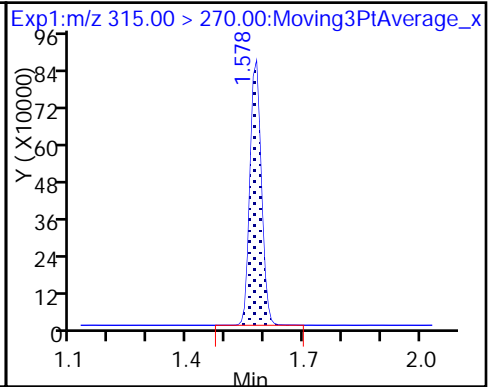
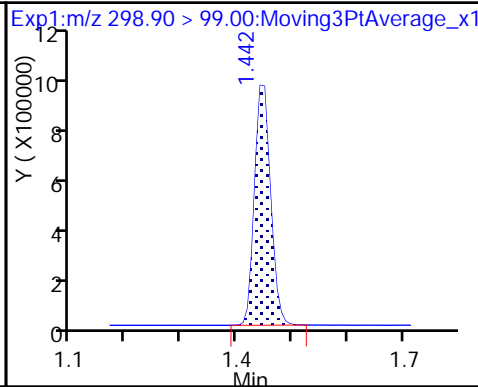
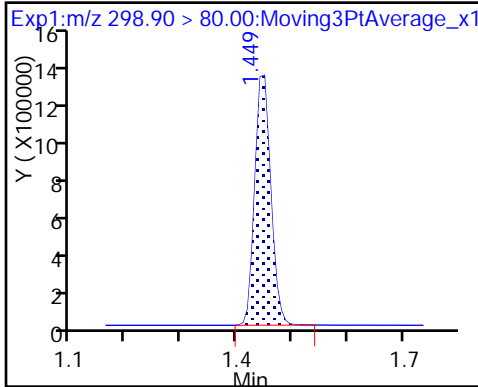
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

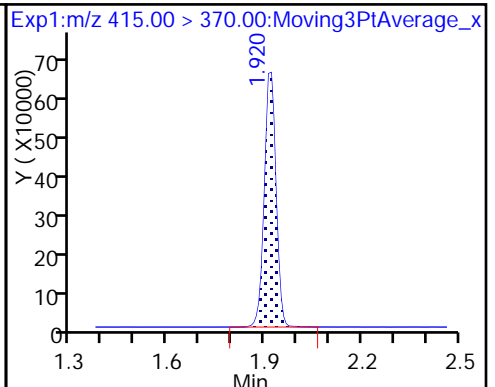
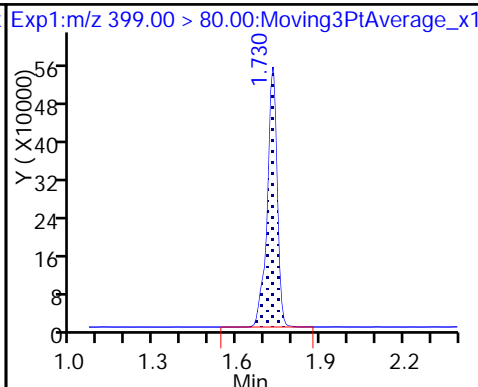
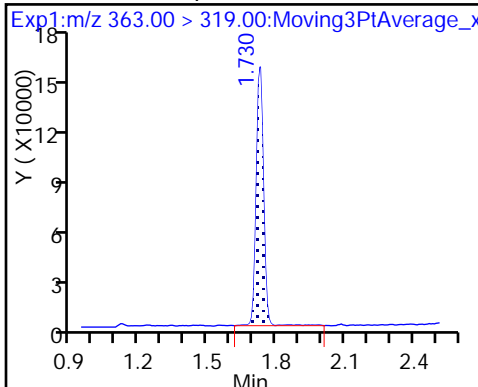
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

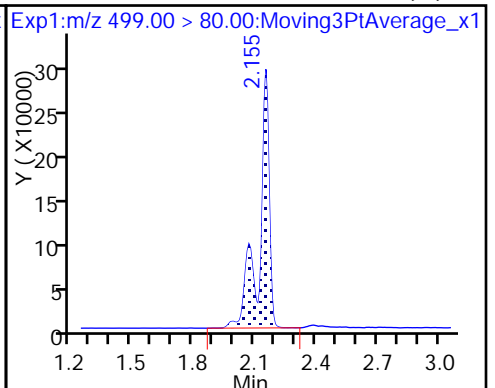
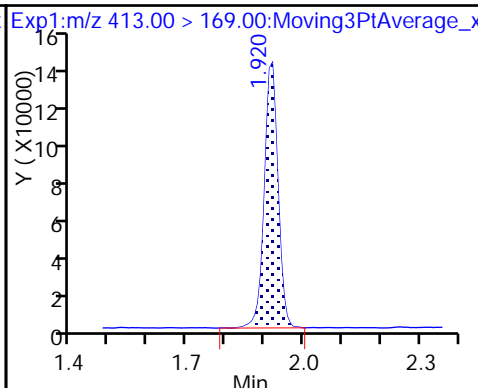
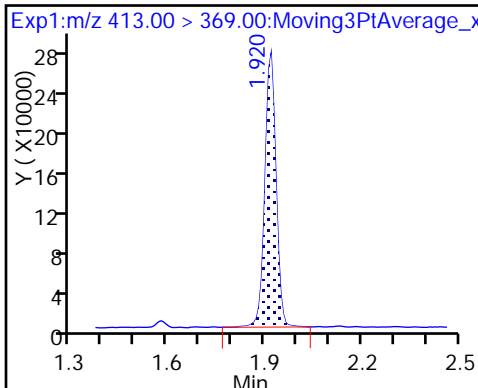
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

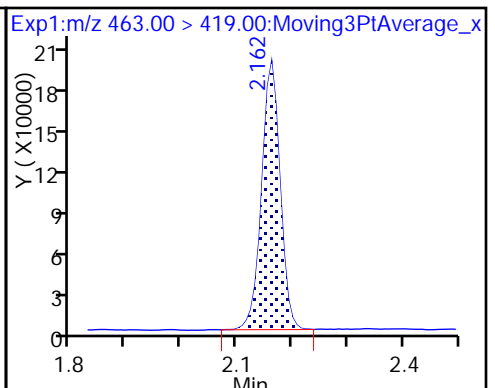
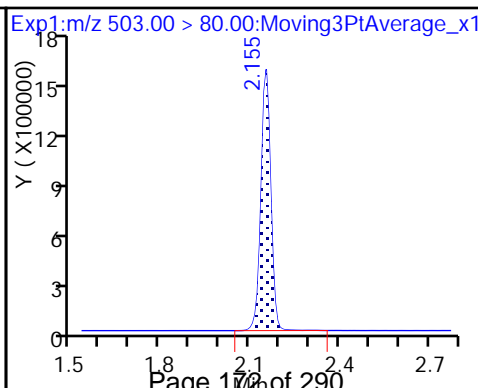
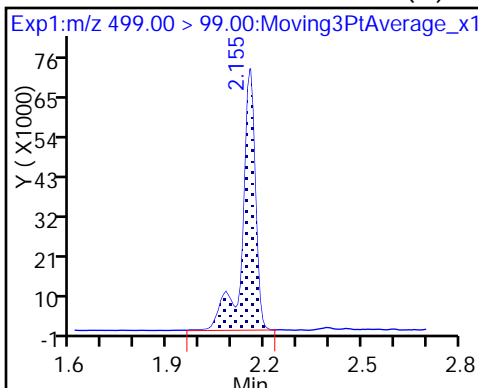
8 Perfluorooctane sulfonic acid (M)



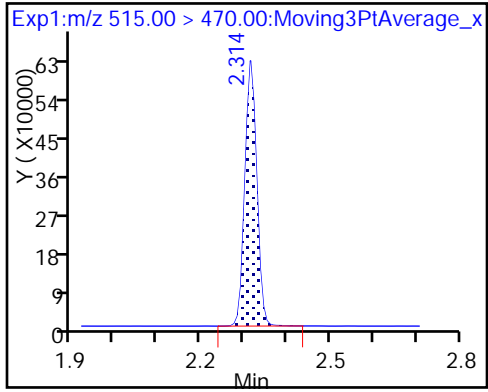
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

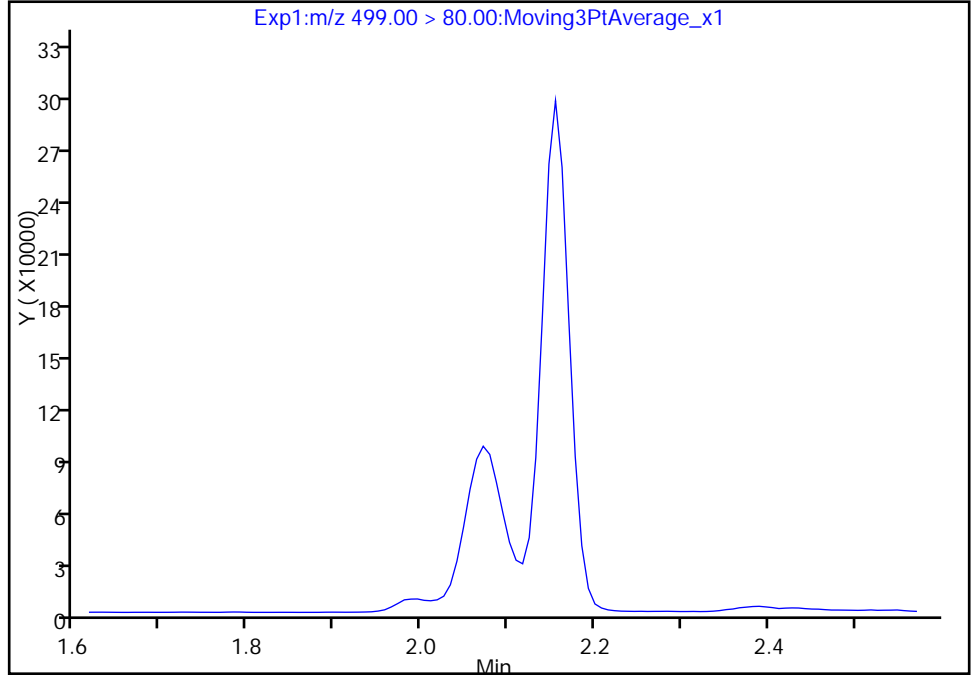
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Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

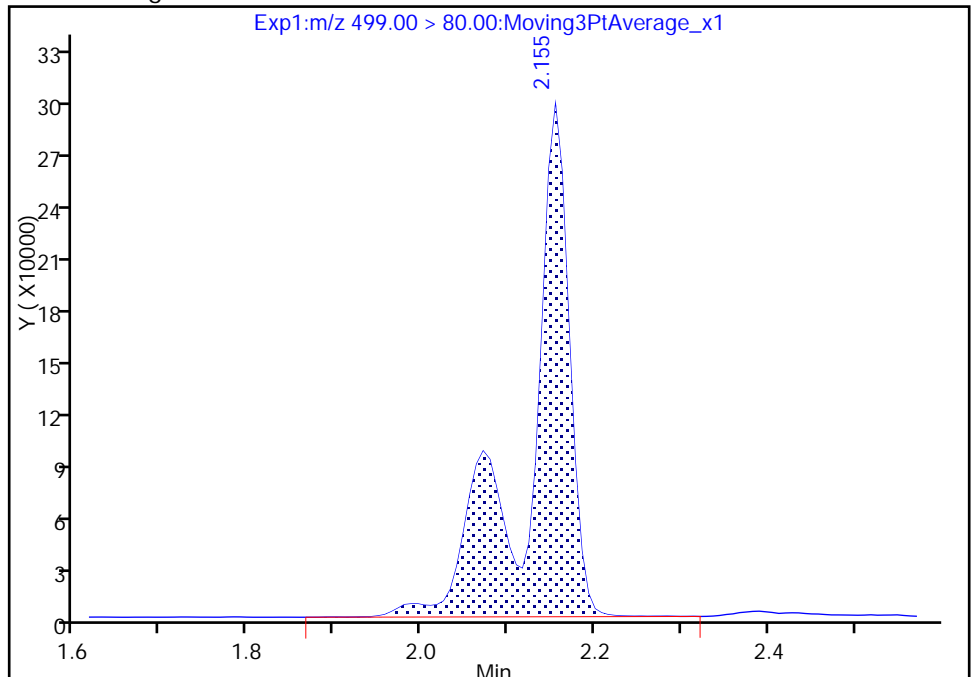
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

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



TestAmerica Sacramento

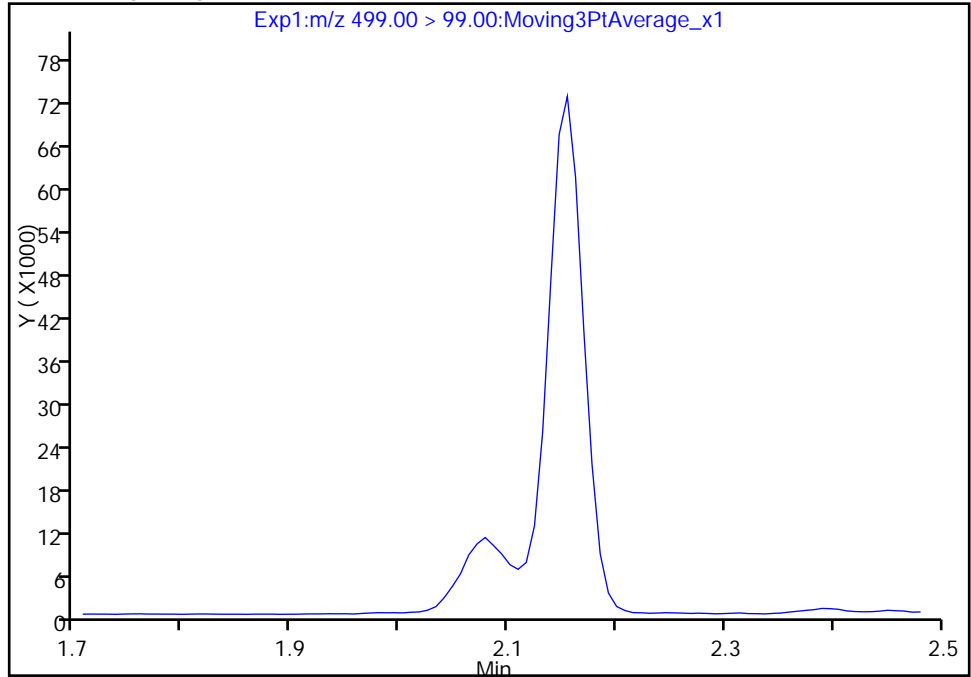
Data File: \\ChromNa\Sacramento\ChromData\A8_N\201711106-49975.b\2017.11.03_537XICAL_005.d
Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: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

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

Signal: 2

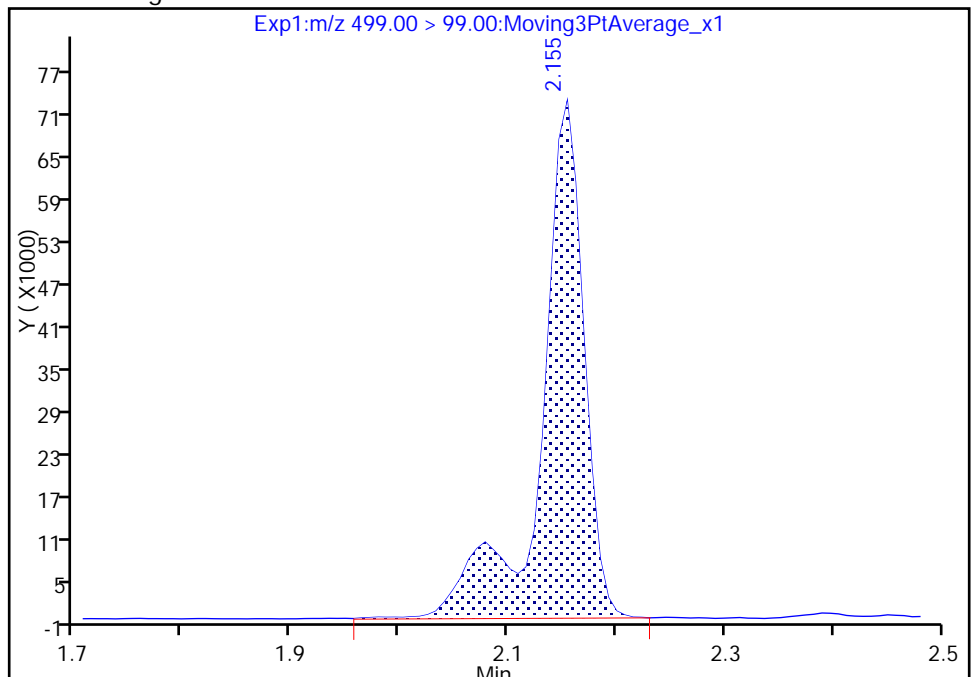
Not Detected
Expected RT: 2.15

Processing Integration Results



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

Manual Integration Results



TestAmerica Sacramento

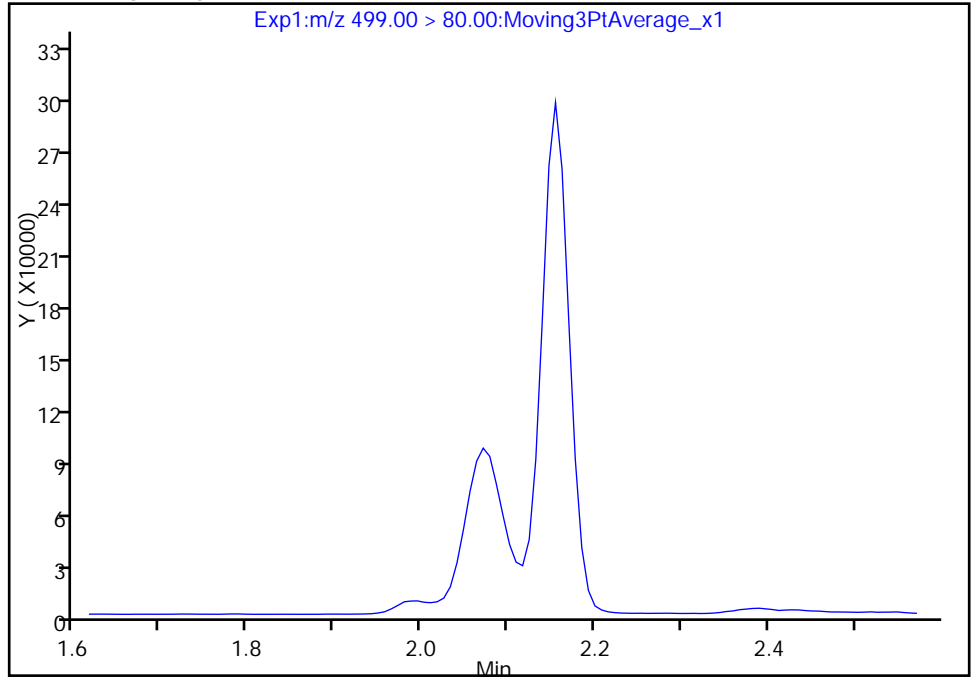
Data File: \\ChromNa\Sacramento\ChromData\A8_N\201711106-49975.b\2017.11.03_537XICAL_005.d
Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: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

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

Signal: 1

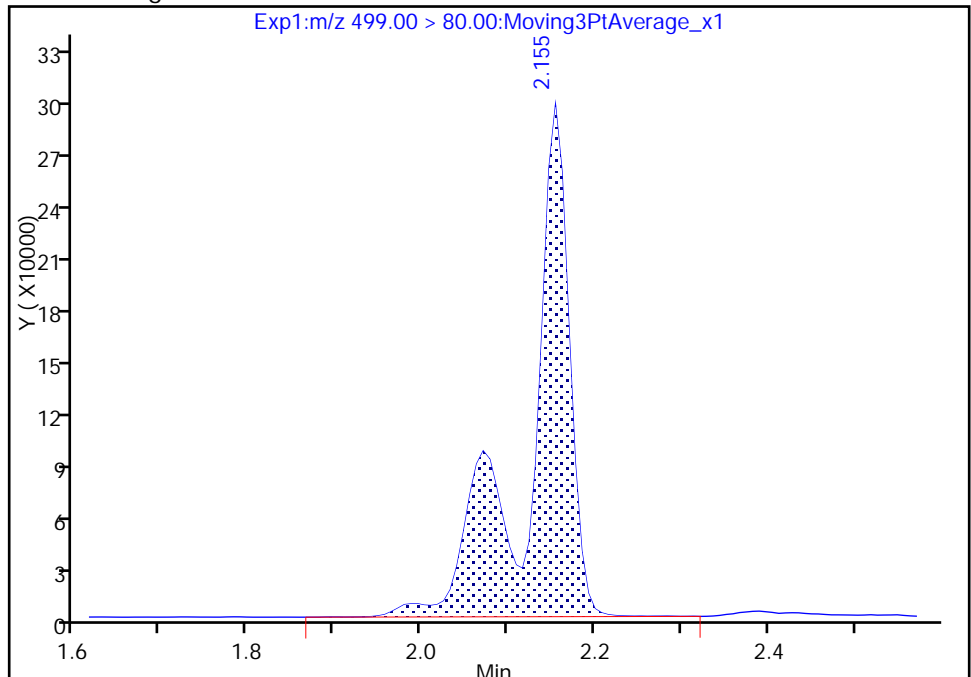
Not Detected
Expected RT: 2.15

Processing Integration Results



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

Manual Integration Results



Reviewer: phomsophat, 06-Nov-2017 07:18:24

Audit Action: Manually Integrated

Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_006.d
 Lims ID: IC L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 03-Nov-2017 13:47:20 ALS Bottle#: 3 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L3_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Nov-2017 15:52:09 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:20:04

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.442 | 1.444 | -0.002 | 1.000 | 5461974 | 46.7 | | 3220 | |
| 298.90 > 99.00 | 1.442 | 1.444 | -0.002 | 1.000 | 3903438 | | 1.40(0.00-0.00) | 8589 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.571 | 1.573 | -0.003 | 1.000 | 1701491 | 10.0 | | 9021 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.722 | 1.725 | -0.003 | 1.000 | 2908204 | 15.6 | | 5000 | |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.722 | 1.725 | -0.003 | 1.000 | 736034 | 5.10 | | 208 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.912 | 1.913 | -0.001 | | 1540946 | 10.0 | | 6787 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.912 | 1.914 | -0.002 | 1.000 | 1388033 | 9.73 | | 256 | |
| 413.00 > 169.00 | 1.912 | 1.914 | -0.002 | 1.000 | 715399 | | 1.94(0.00-0.00) | 904 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.147 | 2.147 | 0.0 | 1.000 | 2067792 | 19.8 | | 2001 | |
| 499.00 > 99.00 | 2.147 | 2.147 | 0.0 | 1.000 | 431075 | | 4.80(0.00-0.00) | 922 | |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.147 | 2.151 | -0.004 | | 3194016 | 28.7 | | 4956 | |
| 9 Perfluorononanoic acid | | | | | | | | | |
| 463.00 > 419.00 | 2.155 | 2.158 | -0.003 | 1.000 | 1020851 | 9.97 | | 302 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.306 | 2.312 | -0.006 | 1.000 | 1166275 | 9.89 | | 6310 | |

Reagents:

LC537-L3_00023

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537ICAL_006.d

Injection Date: 03-Nov-2017 13:47:20

Instrument ID: A8_N

Lims ID: IC L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

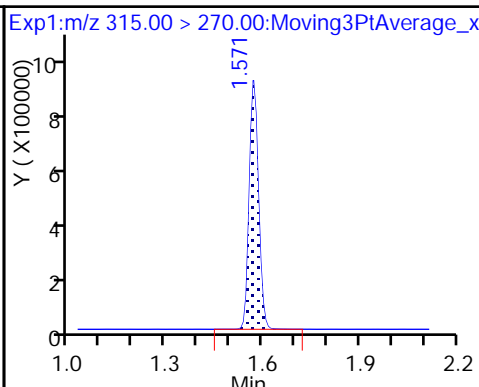
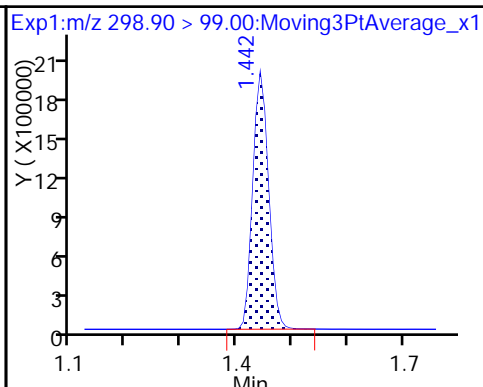
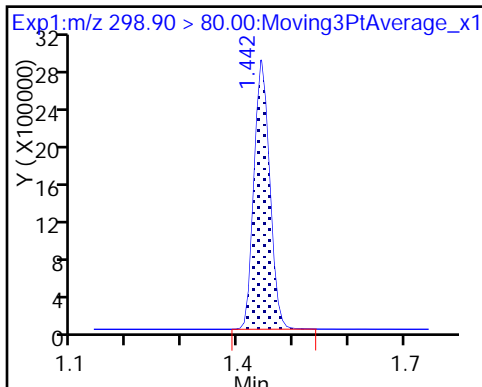
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

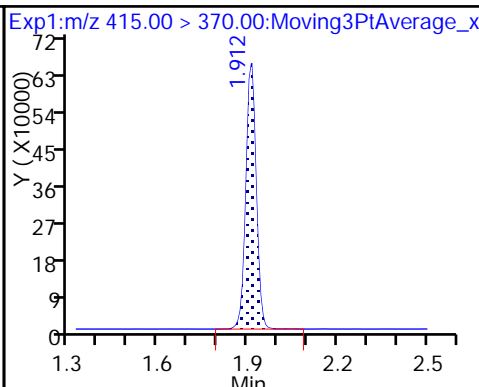
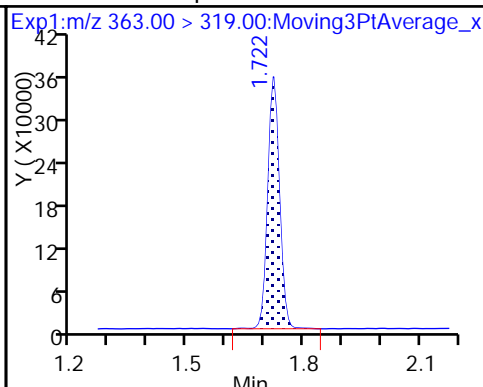
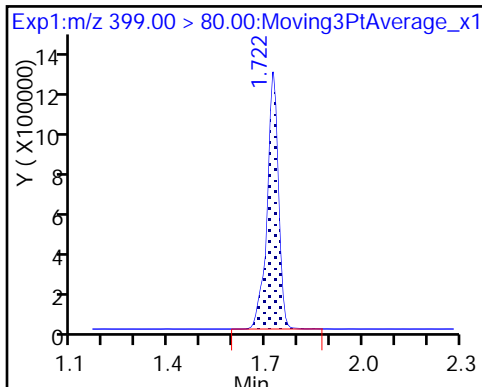
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

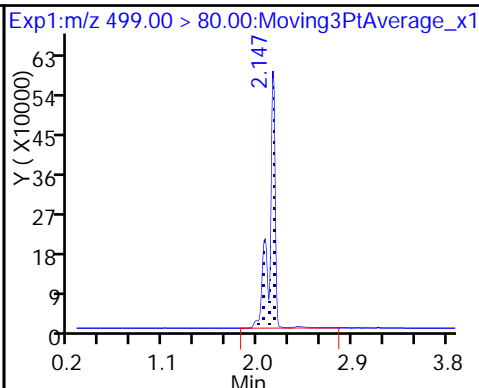
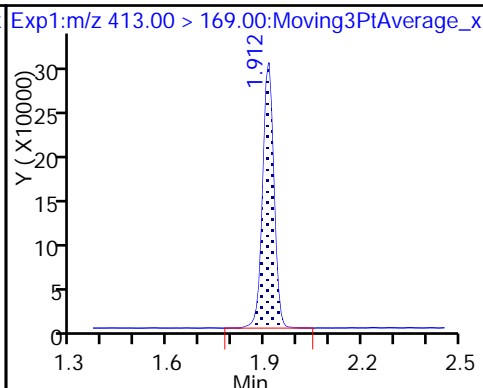
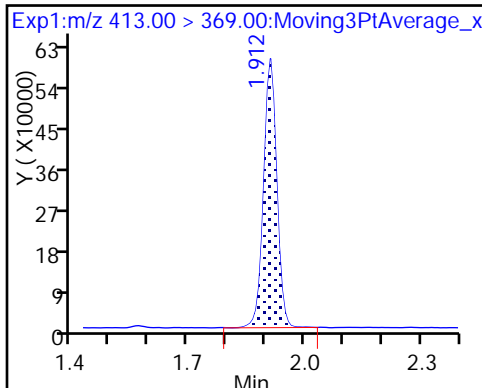
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

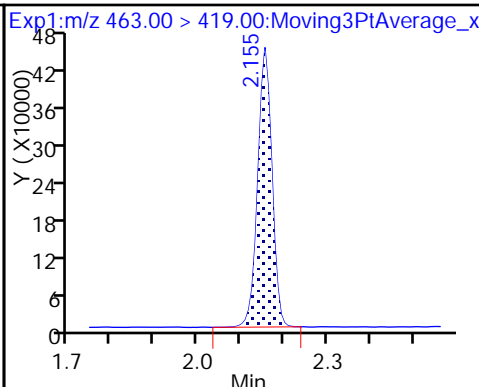
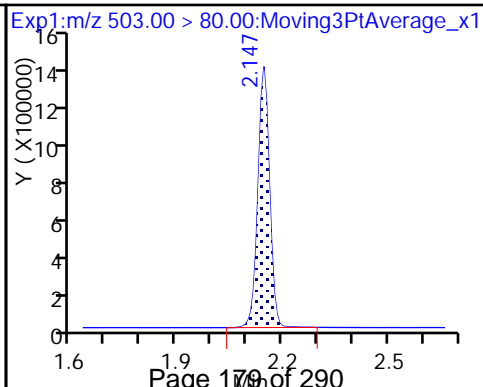
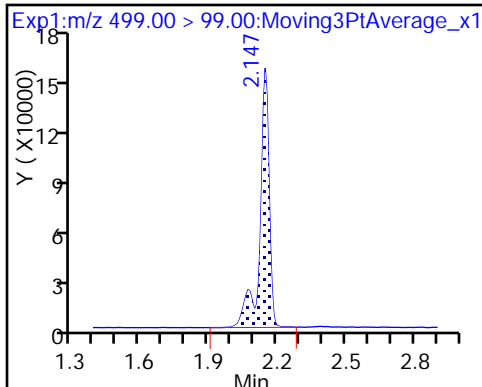
8 Perfluorooctane sulfonic acid



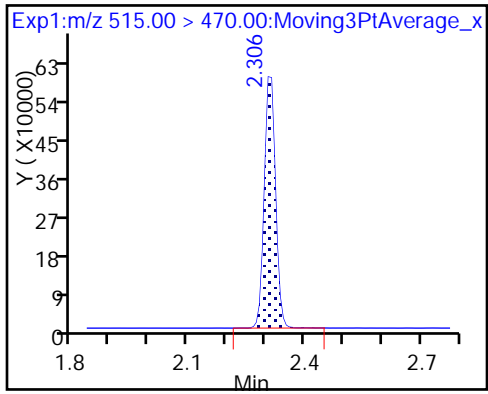
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_007.d
 Lims ID: IC L4
 Client ID:
 Sample Type: ICISAV Calib Level: 4
 Inject. Date: 03-Nov-2017 13:52:00 ALS Bottle#: 4 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L4_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Nov-2017 15:52:10 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:20:46

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.442 | 1.444 | -0.002 | 1.000 | 10142530 | 87.2 | | 5274 | |
| 298.90 > 99.00 | 1.442 | 1.444 | -0.002 | 1.000 | 7408390 | | 1.37(0.00-0.00) | 12862 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.571 | 1.573 | -0.003 | 1.000 | 1719911 | 10.1 | | 8503 | |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.722 | 1.725 | -0.003 | 1.000 | 1420703 | 9.81 | | 399 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.722 | 1.725 | -0.003 | 1.000 | 5871843 | 29.8 | | 7622 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.912 | 1.913 | -0.001 | | 1546307 | 10.0 | | 6563 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.912 | 1.914 | -0.002 | 1.000 | 2771271 | 19.4 | | 505 | |
| 413.00 > 169.00 | 1.912 | 1.914 | -0.002 | 1.000 | 1520933 | | 1.82(0.00-0.00) | 1919 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.155 | 2.147 | 0.008 | 1.000 | 4363079 | 39.5 | | 3896 | M |
| 499.00 > 99.00 | 2.155 | 2.147 | 0.008 | 1.000 | 902486 | | 4.83(0.00-0.00) | 1588 | M |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.155 | 2.151 | 0.004 | | 3374600 | 28.7 | | 5331 | |
| 9 Perfluorononanoic acid | | | | | | | | | |
| 463.00 > 419.00 | 2.162 | 2.158 | 0.004 | 1.000 | 2106479 | 20.5 | | 638 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.314 | 2.312 | 0.002 | 1.000 | 1207887 | 10.2 | | 7165 | |

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L4_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537ICAL_007.d

Injection Date: 03-Nov-2017 13:52:00

Instrument ID: A8_N

Lims ID: IC L4

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 4

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

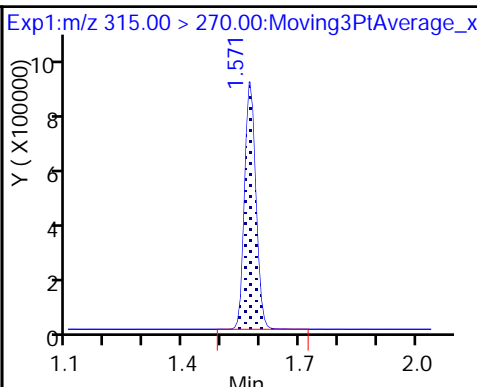
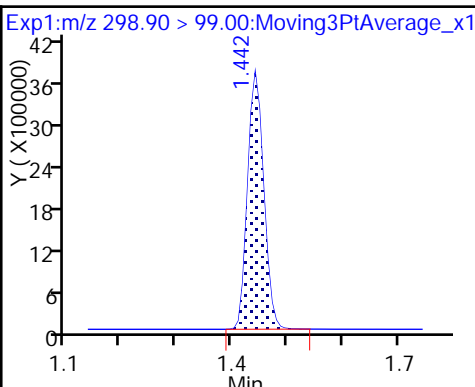
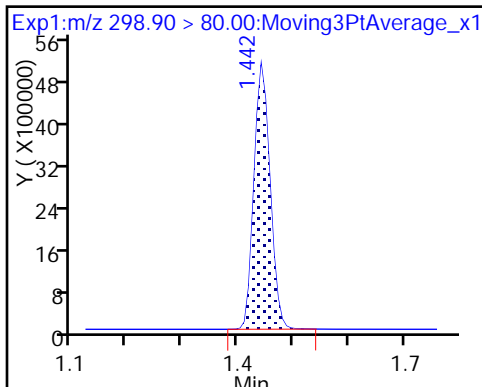
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

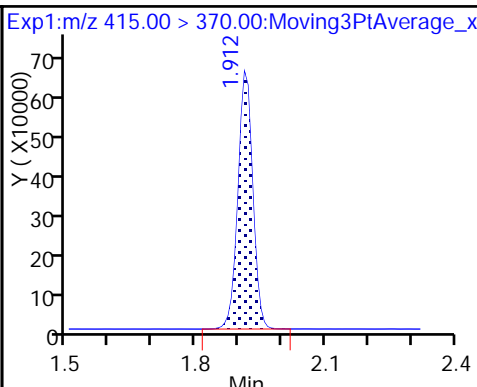
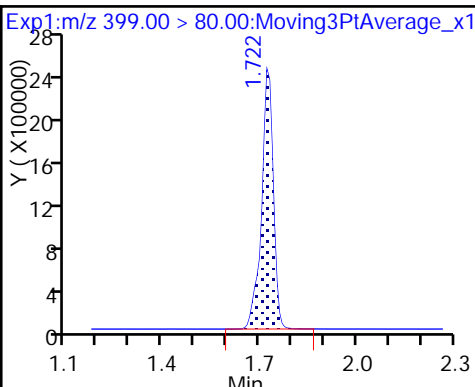
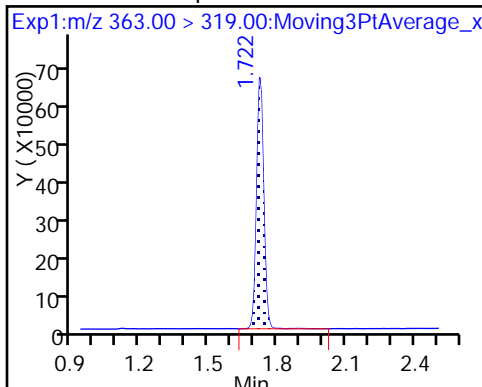
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

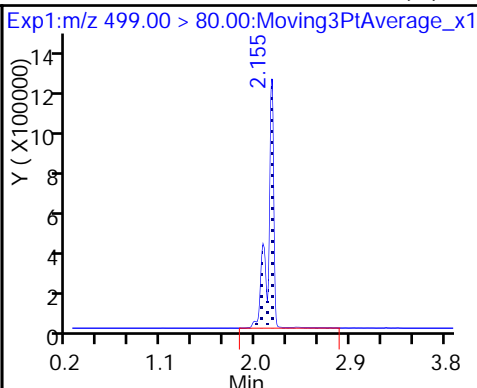
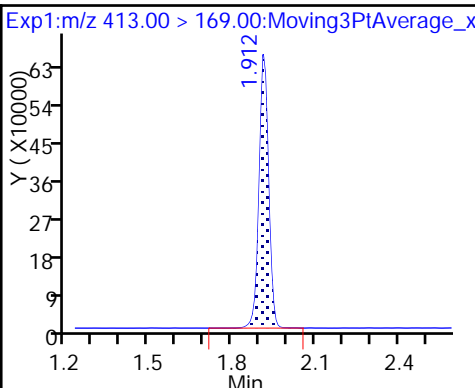
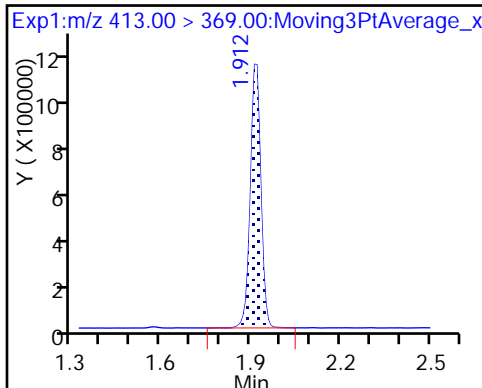
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

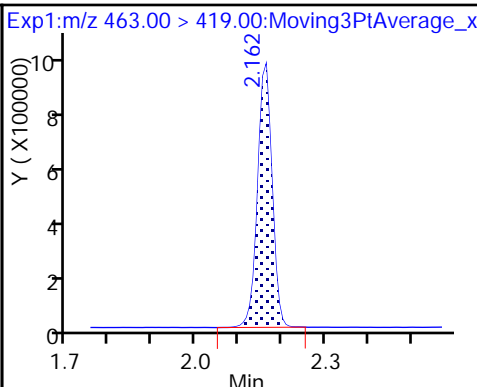
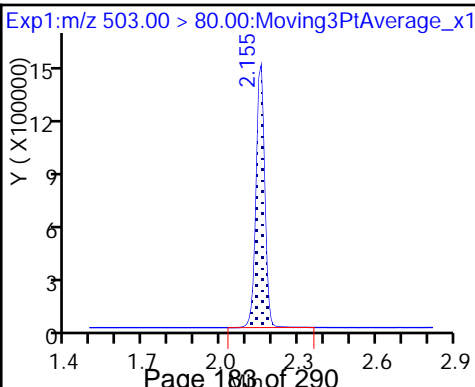
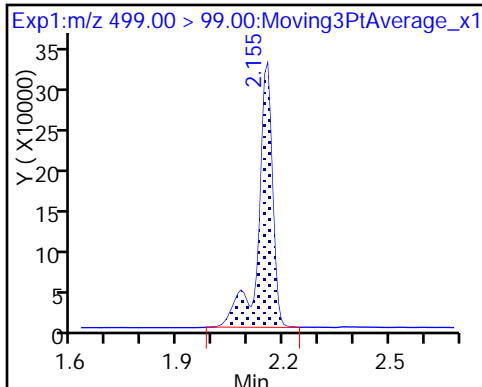
8 Perfluorooctane sulfonic acid (M)



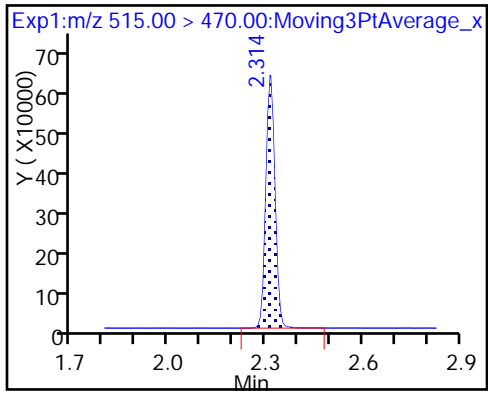
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

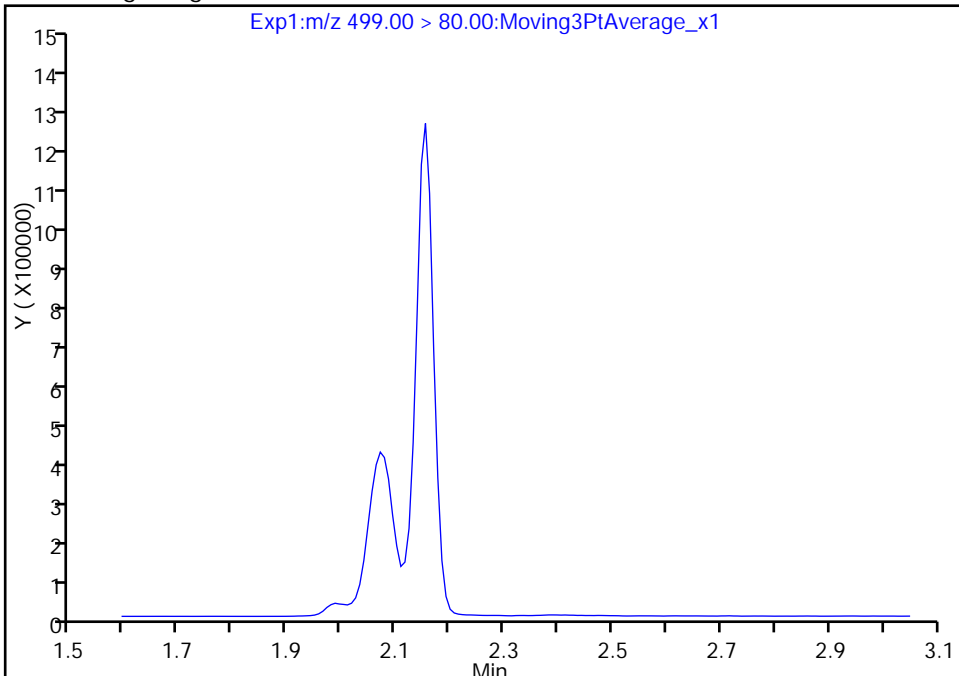
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_007.d
Injection Date: 03-Nov-2017 13:52:00 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: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

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

Signal: 1

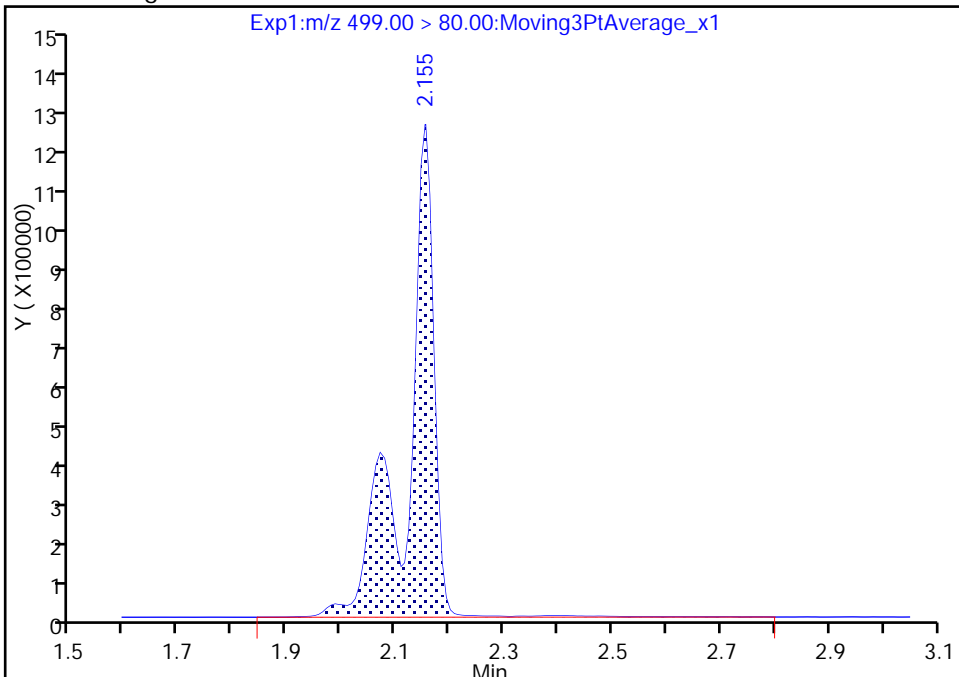
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 4363079
Amount: 39.491903
Amount Units: ng/ml



TestAmerica Sacramento

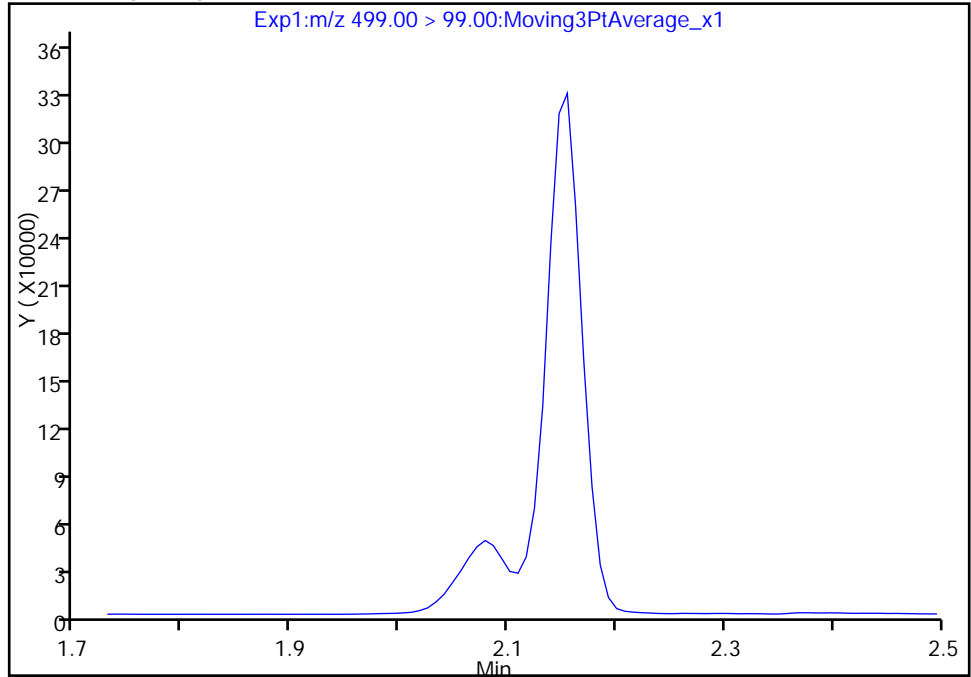
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_007.d
Injection Date: 03-Nov-2017 13:52:00 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: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

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

Signal: 2

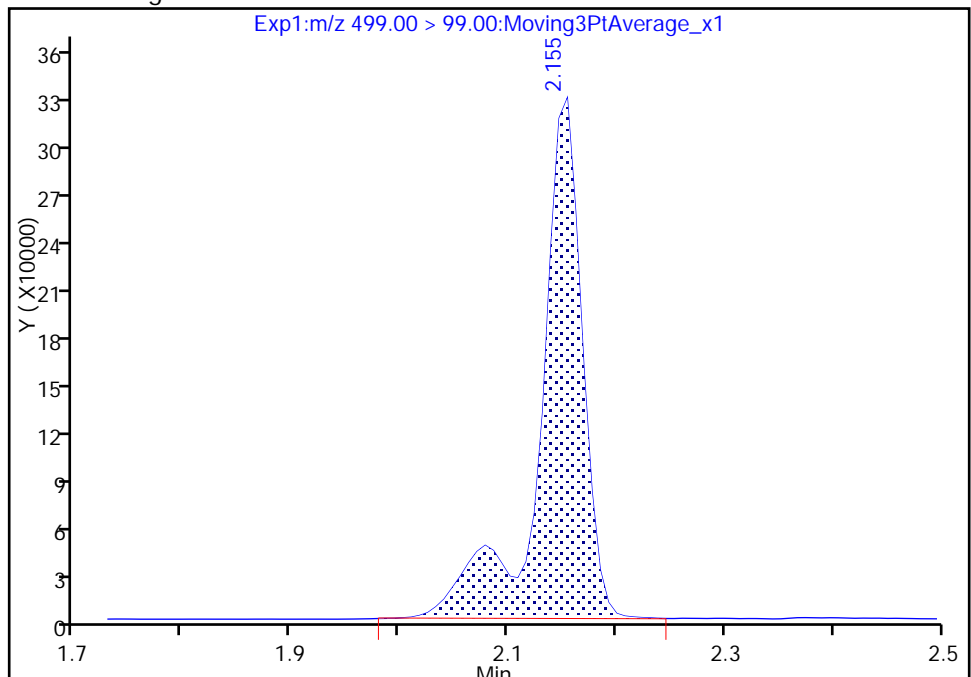
Not Detected
Expected RT: 2.15

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

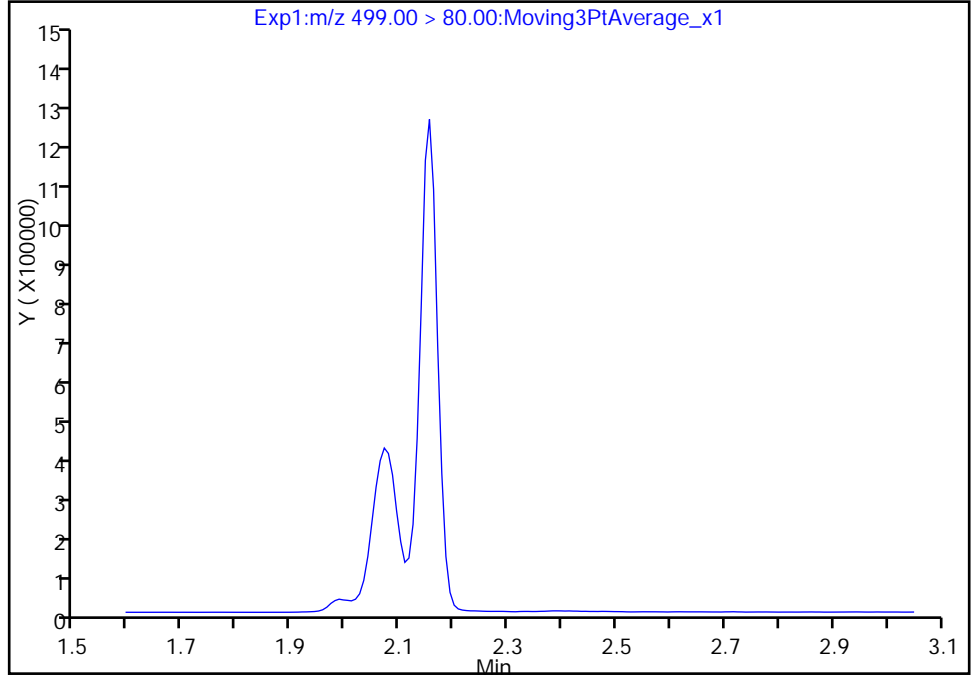
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Injection Date: 03-Nov-2017 13:52:00 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

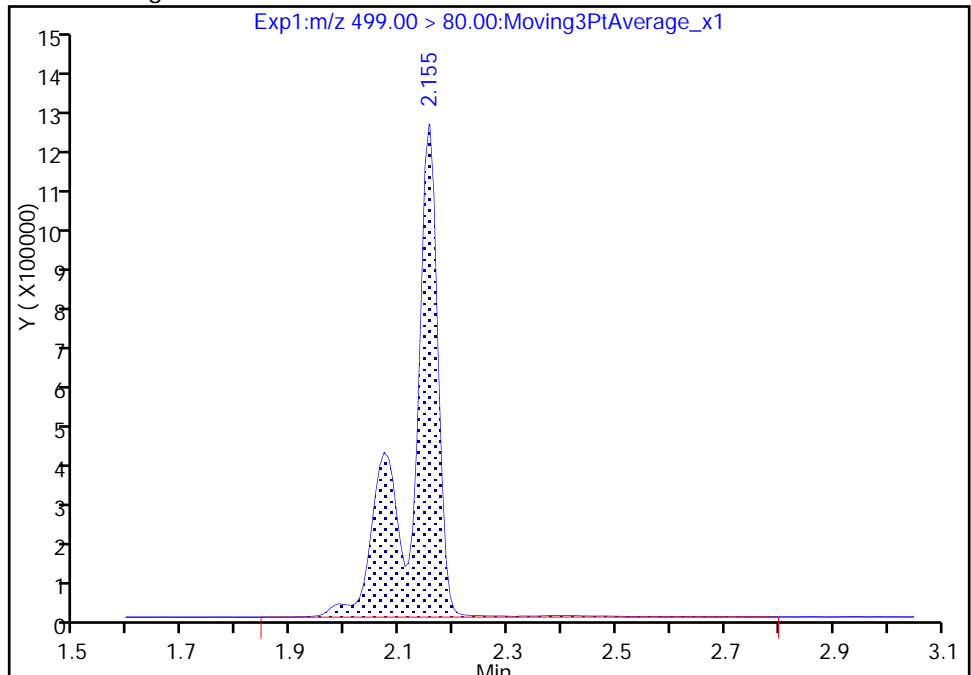
Not Detected
Expected RT: 2.15

Processing Integration Results



RT: 2.15
Area: 4363079
Amount: 39.491903
Amount Units: ng/ml

Manual Integration Results



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

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

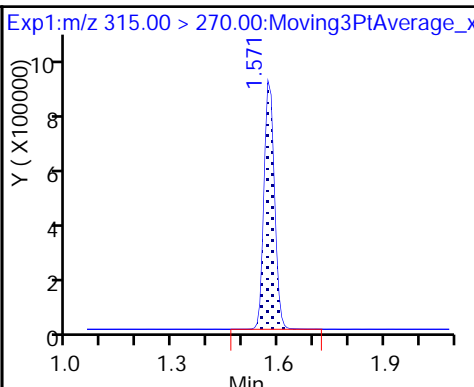
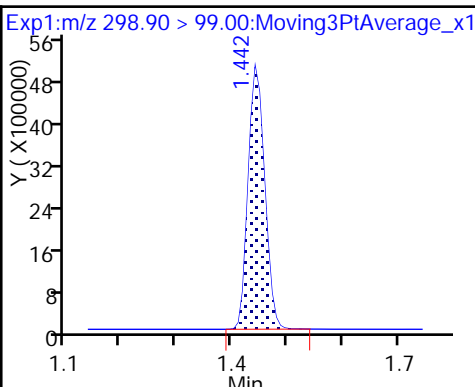
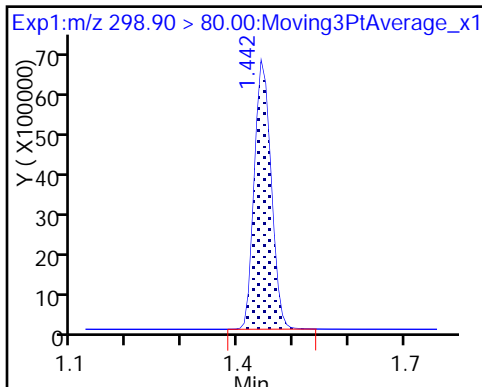
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

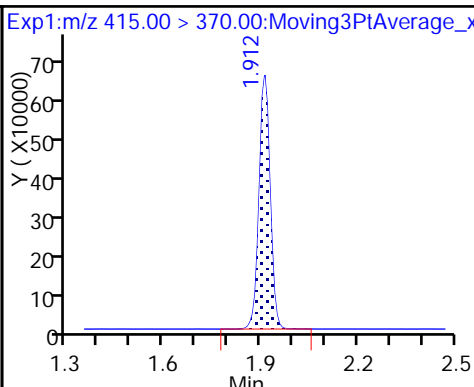
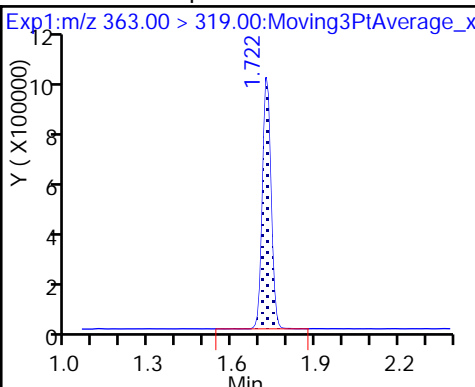
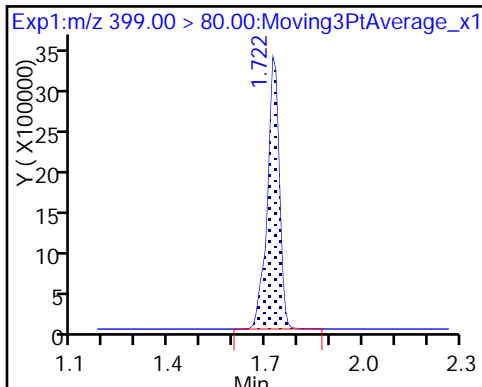
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

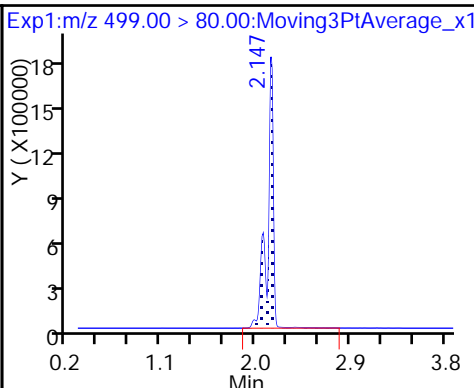
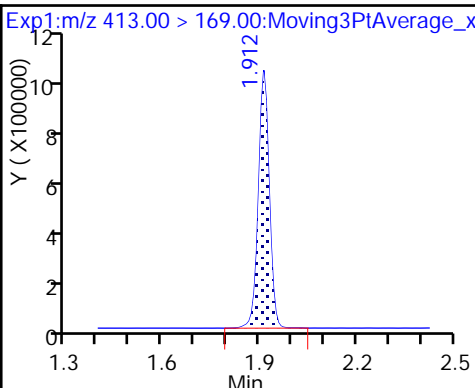
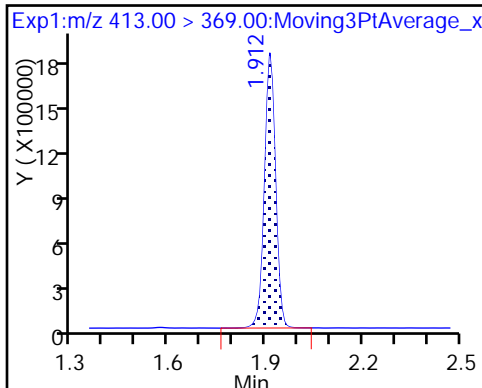
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

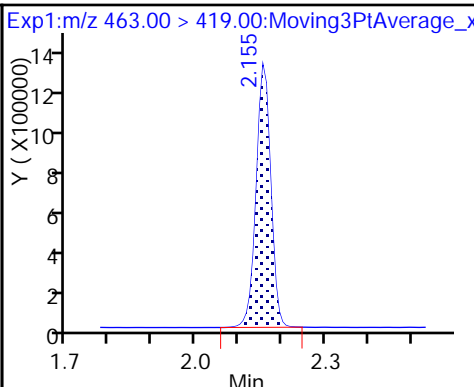
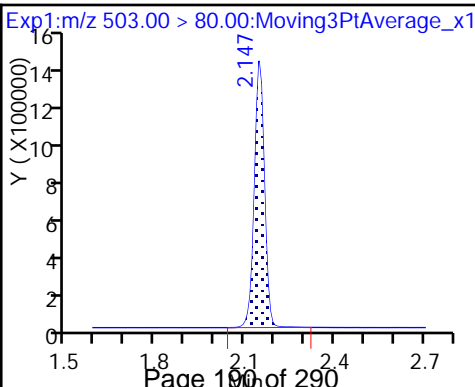
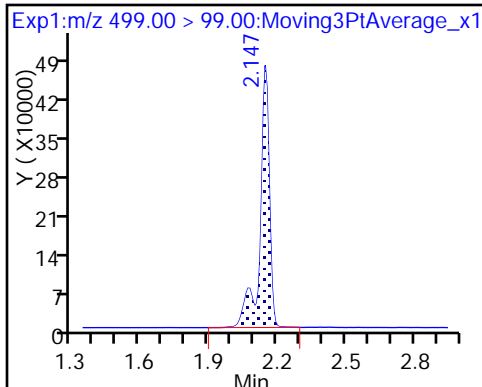
8 Perfluorooctane sulfonic acid



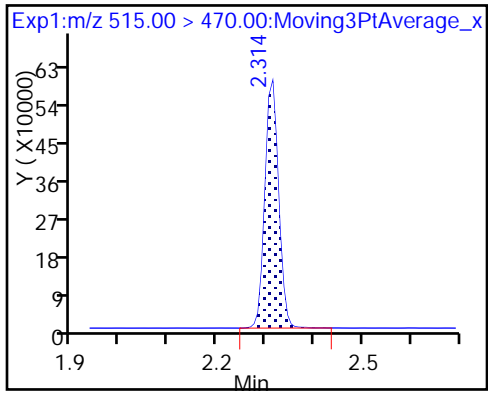
8 Perfluorooctane sulfonic acid

* 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

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

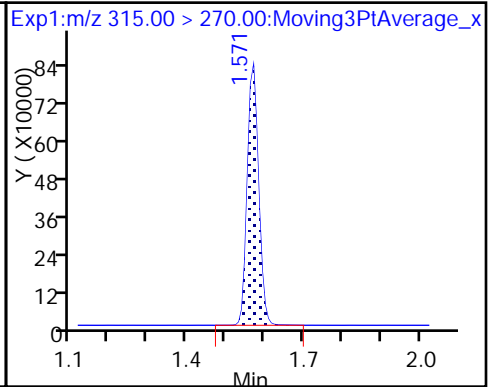
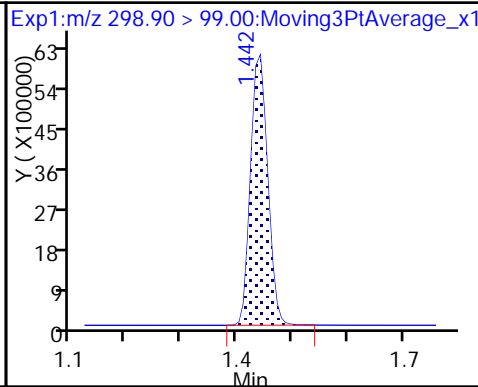
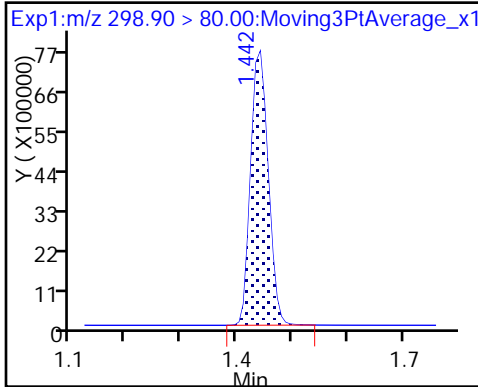
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

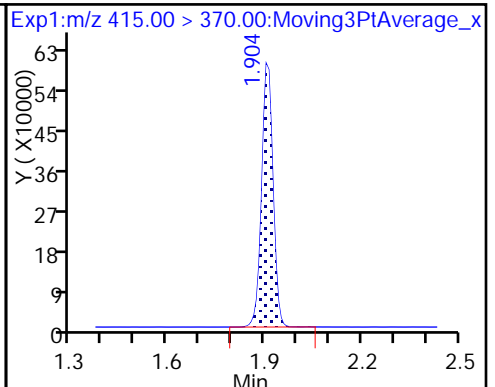
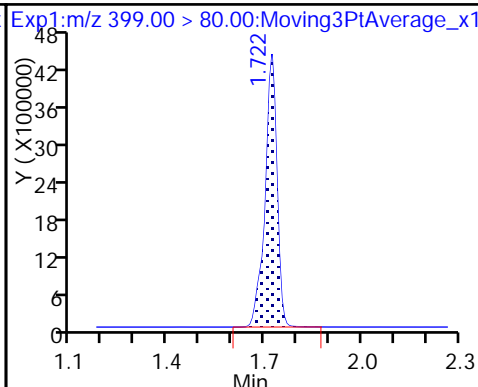
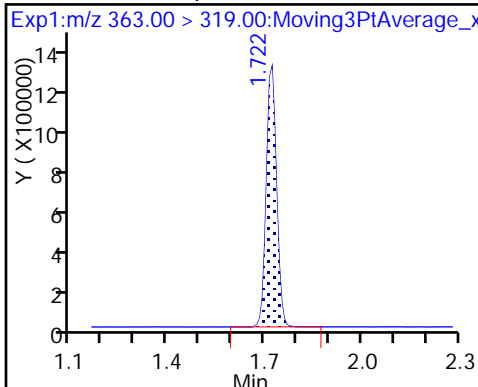
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

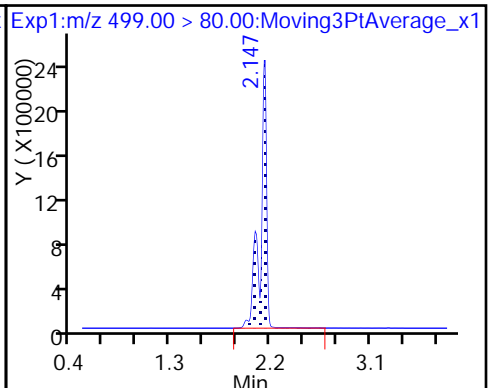
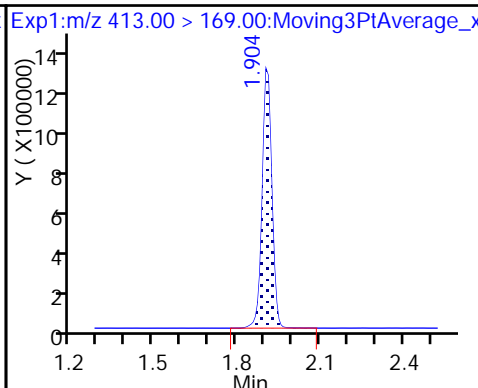
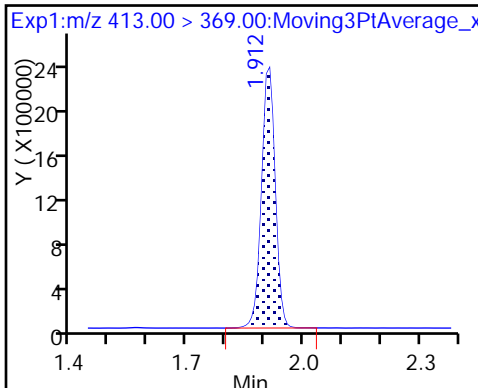
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

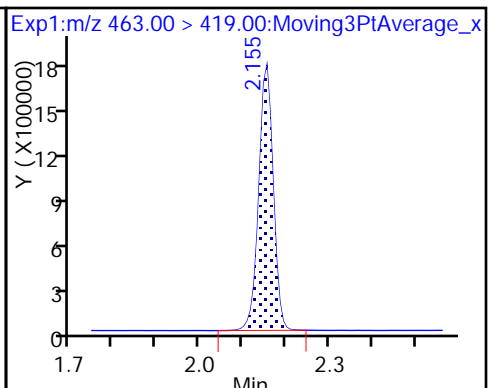
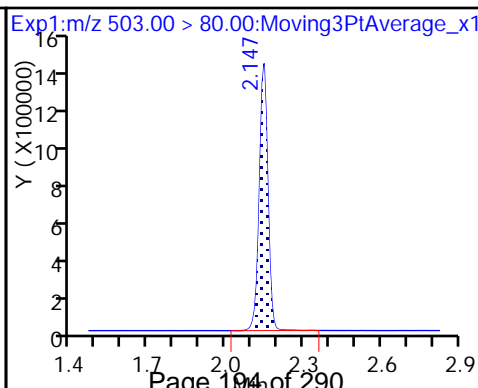
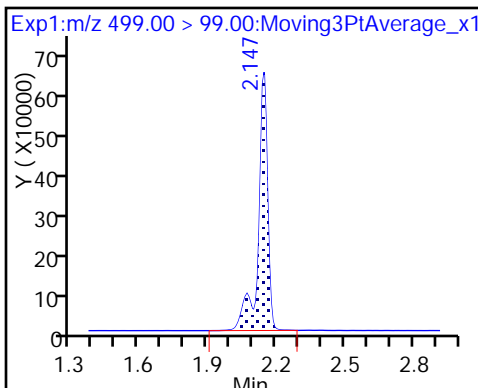
8 Perfluorooctane sulfonic acid



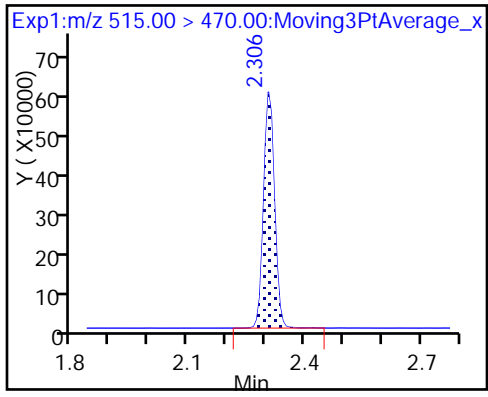
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-192908/11 Calibration Date: 11/03/2017 14:10
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.11.03_537XICAL_011.d Conc. Units: ng/mL

| ANALYTE | CURVE TYPE | AVE RRF | RRF | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D | MAX %D |
|--------------------------------------|------------|---------|--------|---------|-------------|--------------|------|--------|
| Perfluorobutanesulfonic acid (PFBS) | QuaF | | 1.109 | | 20.4 | 20.0 | 1.9 | 50.0 |
| Perfluoroheptanoic acid (PFHpA) | Ave | 0.9369 | 0.9382 | | 2.23 | 2.22 | 0.1 | 50.0 |
| Perfluorohexanesulfonic acid (PFHxS) | Ave | 1.674 | 1.688 | | 6.72 | 6.67 | 0.8 | 50.0 |
| Perfluorooctanoic acid (PFOA) | Ave | 0.9258 | 0.8825 | | 4.24 | 4.45 | -4.7 | 50.0 |
| Perfluorooctanesulfonic acid (PFOS) | Ave | 0.9389 | 0.9176 | | 8.69 | 8.89 | -2.3 | 50.0 |
| Perfluorononanoic acid (PFNA) | Ave | 0.6642 | 0.6625 | | 4.43 | 4.45 | -0.2 | 50.0 |
| 13C2 PFHxA | Ave | 1.100 | 1.068 | | 9.70 | 10.0 | -3.0 | 30.0 |
| 13C2 PFDA | Ave | 0.7652 | 0.7460 | | 9.75 | 10.0 | -2.5 | 30.0 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_011.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 03-Nov-2017 14:10:44 ALS Bottle#: 2 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L2
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Nov-2017 15:39:07 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:26:29

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.449 | 1.444 | 0.005 | 1.000 | 2556738 | 20.4 | | 1537 | |
| 298.90 > 99.00 | 1.449 | 1.444 | 0.005 | 1.000 | 1750170 | | 1.46(0.00-0.00) | 4023 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.578 | 1.573 | 0.005 | 1.000 | 1694196 | 9.70 | | 8915 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.730 | 1.725 | 0.005 | 1.000 | 1297654 | 6.72 | | 2410 | |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.730 | 1.725 | 0.005 | 1.000 | 330927 | 2.23 | | 99.4 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.912 | 1.913 | -0.001 | | 1586829 | 10.0 | | 6840 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.912 | 1.914 | -0.002 | 1.000 | 622915 | 4.24 | | 116 | |
| 413.00 > 169.00 | 1.912 | 1.914 | -0.002 | 1.000 | 335080 | | 1.86(0.00-0.00) | 460 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.155 | 2.147 | 0.008 | 1.000 | 940397 | 8.69 | | 528 | |
| 499.00 > 99.00 | 2.147 | 2.147 | 0.0 | 0.996 | 196397 | | 4.79(0.00-0.00) | 430 | |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.147 | 2.151 | -0.004 | | 3305852 | 28.7 | | 5135 | |
| 9 Perfluorononanoic acid | | | | | | | | | |
| 463.00 > 419.00 | 2.162 | 2.158 | 0.004 | 1.000 | 467323 | 4.43 | | 143 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.314 | 2.312 | 0.002 | 1.000 | 1183747 | 9.75 | | 6763 | |

Reagents:

LC537-L2_00020

Amount Added: 1.00

Units: mL

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

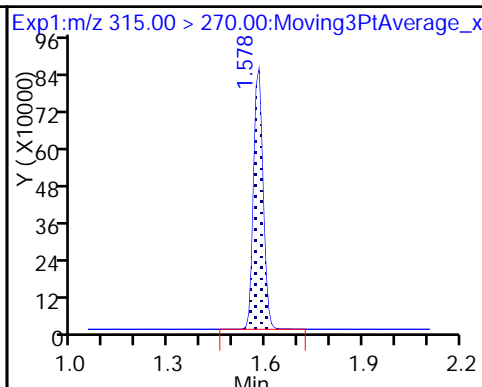
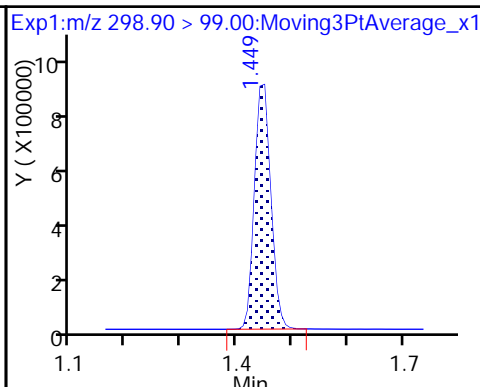
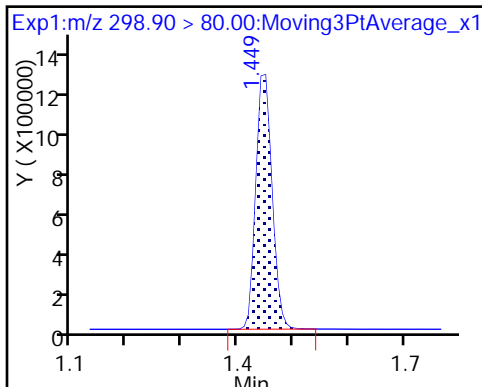
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

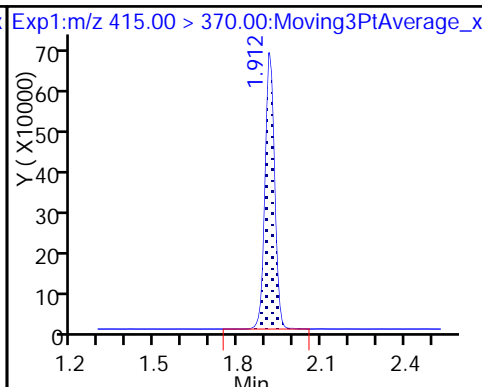
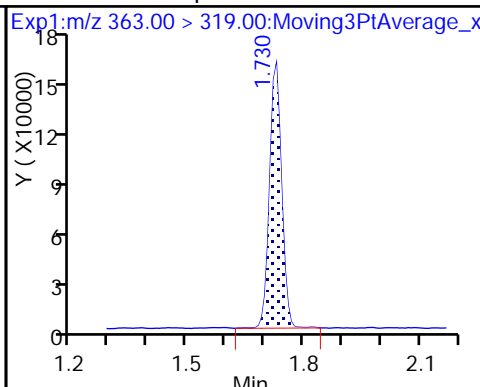
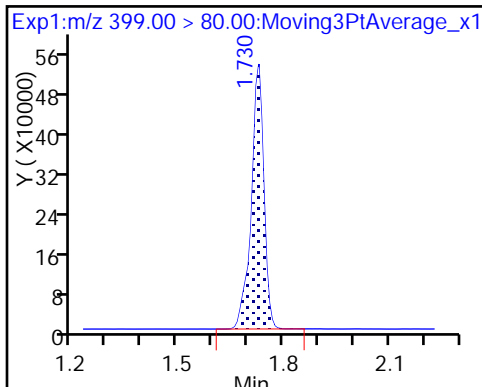
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

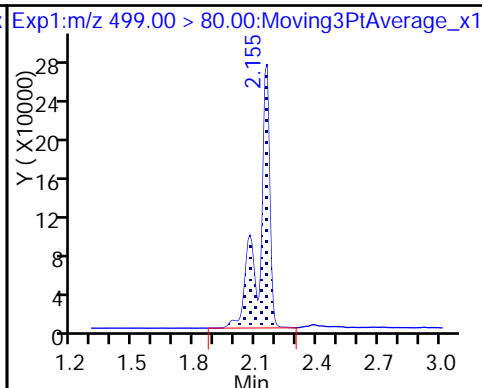
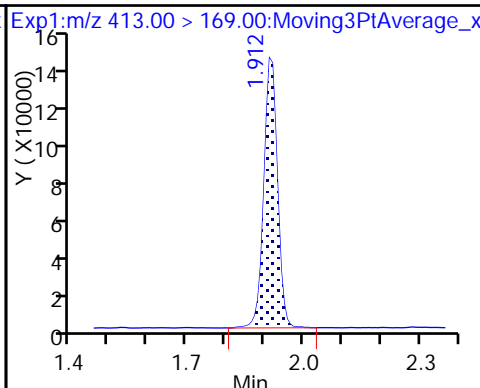
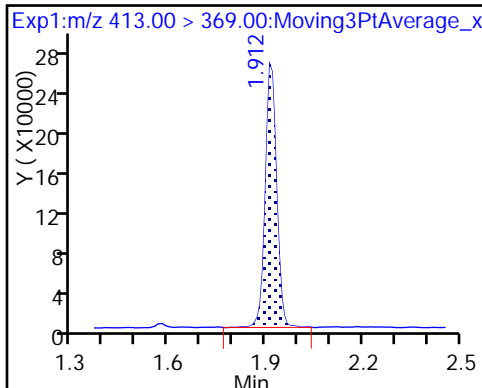
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

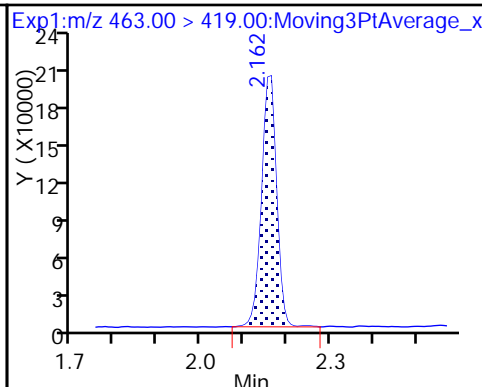
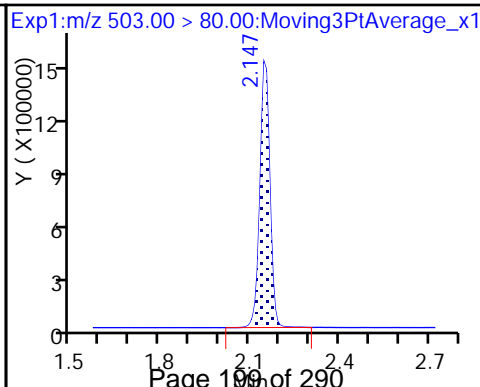
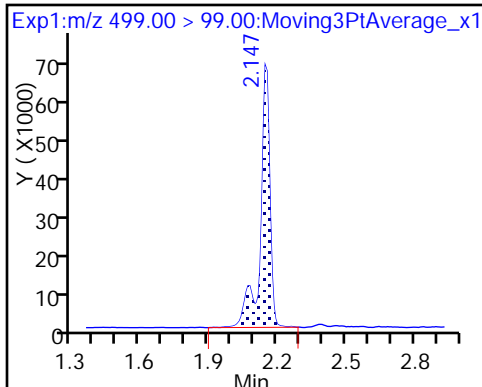
8 Perfluorooctane sulfonic acid



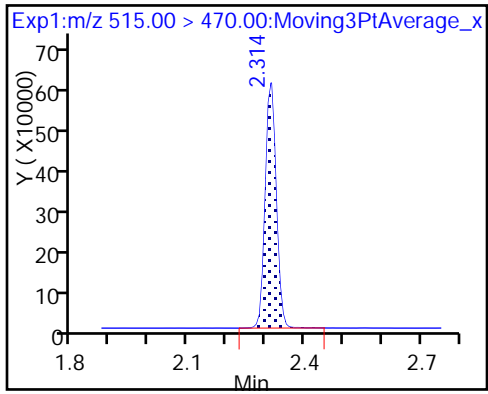
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Lab Sample ID: ICV 320-192908/13 Calibration Date: 11/03/2017 14:20
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.11.03_537XICAL_013.d Conc. Units: ng/mL

| ANALYTE | CURVE TYPE | AVE RRF | RRF | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D | MAX %D |
|--------------------------------------|------------|---------|--------|---------|-------------|--------------|-------|--------|
| Perfluorobutanesulfonic acid (PFBS) | QuaF | | 0.8310 | | 83.7 | 100 | -16.4 | 30.0 |
| Perfluoroheptanoic acid (PFHpA) | Ave | 0.9369 | 0.8136 | | 8.68 | 10.0 | -13.2 | 30.0 |
| Perfluorohexanesulfonic acid (PFHxS) | Ave | 1.674 | 1.463 | | 17.5 | 20.1 | -12.6 | 30.0 |
| Perfluorooctanoic acid (PFOA) | Ave | 0.9258 | 0.7995 | | 17.7 | 20.5 | -13.6 | 30.0 |
| Perfluorooctanesulfonic acid (PFOS) | Ave | 0.9389 | 0.8637 | | 18.1 | 19.7 | -8.0 | 30.0 |
| Perfluorononanoic acid (PFNA) | Ave | 0.6642 | 0.6428 | | 19.5 | 20.1 | -3.2 | 30.0 |
| 13C2 PFHxA | Ave | 1.100 | 1.039 | | 9.44 | 10.0 | -5.6 | 30.0 |
| 13C2 PFDA | Ave | 0.7652 | 0.7391 | | 9.66 | 10.0 | -3.4 | 30.0 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_013.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 03-Nov-2017 14:20:03 ALS Bottle#: 7 Worklist Smp#: 13
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Nov-2017 15:39:08 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:27:24

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.442 | 1.444 | -0.002 | 1.000 | 9960387 | 83.7 | | 4998 | |
| 298.90 > 99.00 | 1.442 | 1.444 | -0.002 | 1.000 | 7235967 | | 1.38(0.00-0.00) | 13514 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.571 | 1.573 | -0.003 | 1.000 | 1570629 | 9.44 | | 8393 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.722 | 1.725 | -0.003 | 1.000 | 3517469 | 17.5 | | 5659 | |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.722 | 1.725 | -0.003 | 1.000 | 1229696 | 8.68 | | 345 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.904 | 1.913 | -0.009 | | 1512045 | 10.0 | | 7643 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.904 | 1.914 | -0.010 | 1.000 | 2476221 | 17.7 | | 475 | |
| 413.00 > 169.00 | 1.904 | 1.914 | -0.010 | 1.000 | 1327388 | | 1.87(0.00-0.00) | 1724 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.140 | 2.147 | -0.007 | 1.000 | 2036944 | 18.1 | | 2323 | |
| 499.00 > 99.00 | 2.140 | 2.147 | -0.007 | 1.000 | 389736 | | 5.23(0.00-0.00) | 830 | |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.140 | 2.151 | -0.011 | | 3433628 | 28.7 | | 5334 | |
| 9 Perfluorononanoic acid | | | | | | | | | |
| 463.00 > 419.00 | 2.147 | 2.158 | -0.011 | 1.000 | 1956116 | 19.5 | | 652 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.306 | 2.312 | -0.006 | 1.000 | 1117553 | 9.66 | | 6230 | |

Reagents:

LC537-ICV_00028

Amount Added: 1.00

Units: mL

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

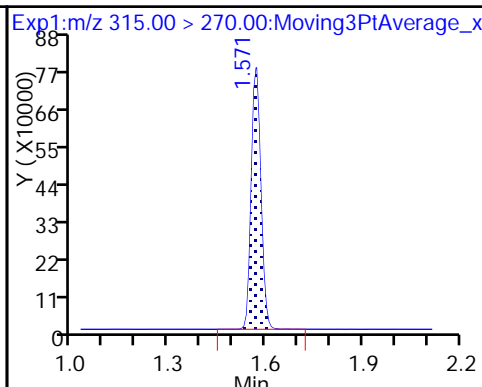
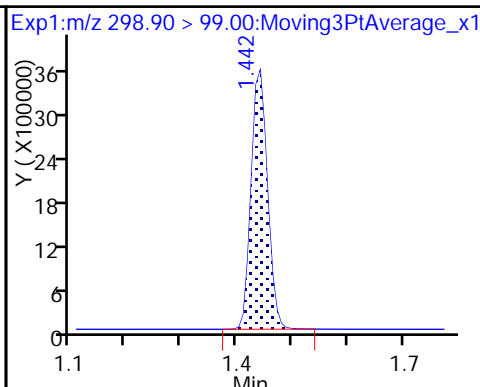
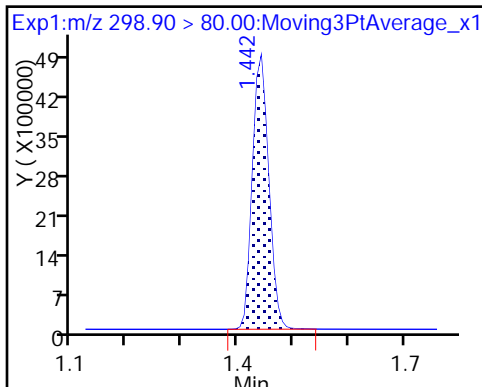
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

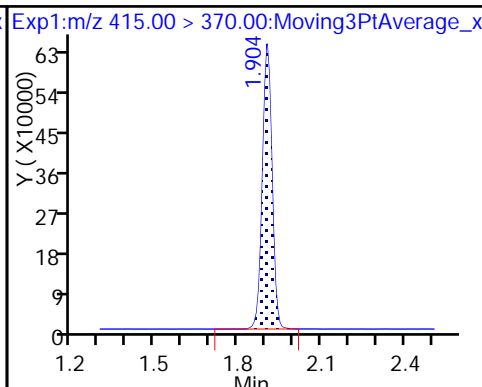
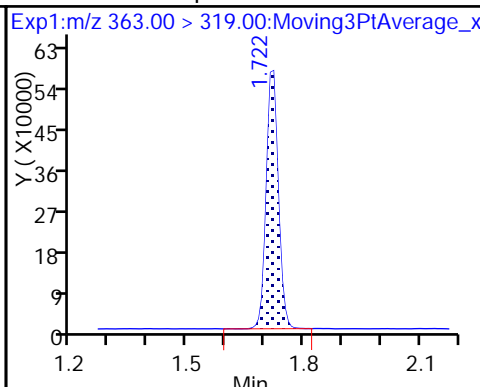
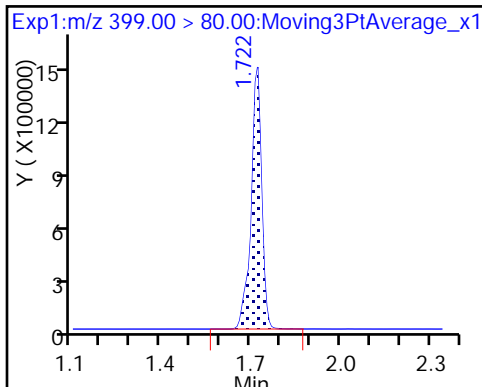
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

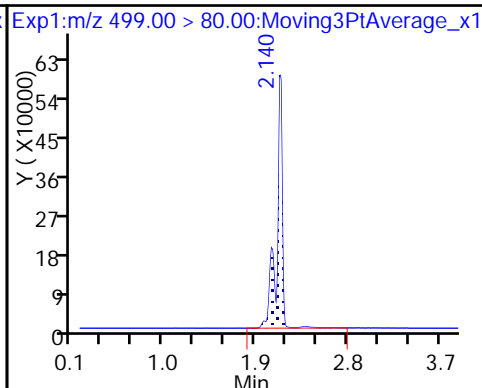
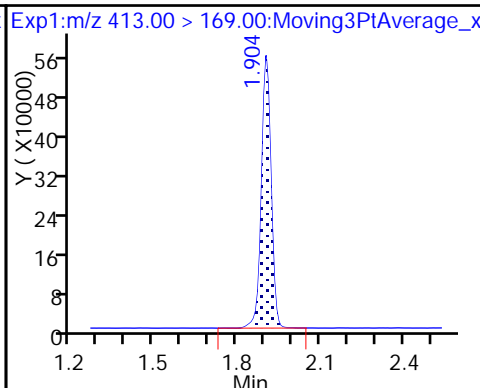
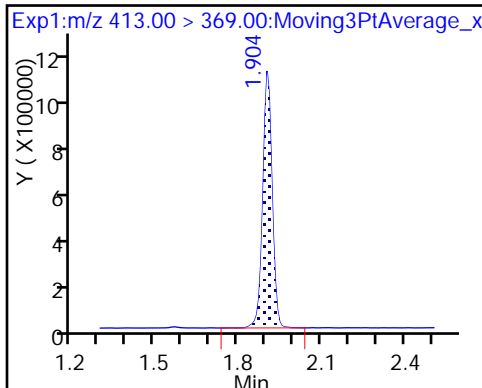
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

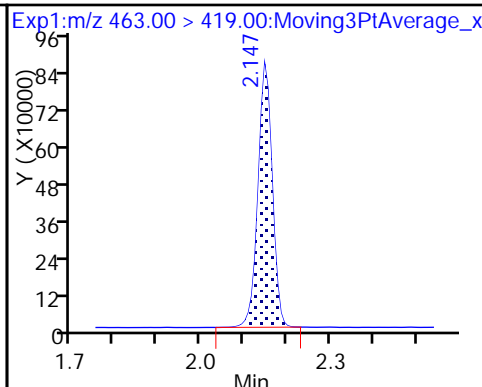
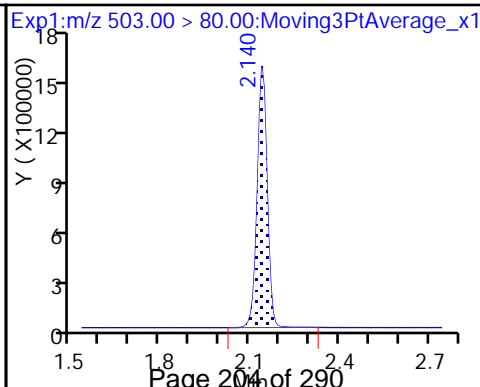
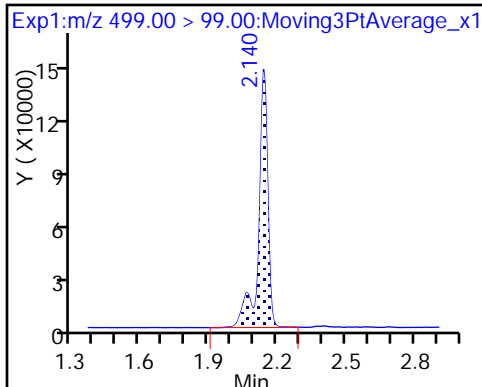
8 Perfluorooctane sulfonic acid



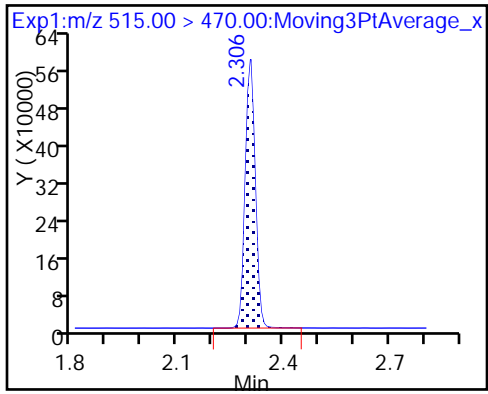
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-200292/1 Calibration Date: 12/18/2017 09:53
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.18_537A_004.d Conc. Units: ng/mL

| ANALYTE | CURVE TYPE | AVE RRF | RRF | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D | MAX %D |
|--------------------------------------|------------|---------|--------|---------|-------------|--------------|------|--------|
| Perfluorobutanesulfonic acid (PFBS) | QuaF | | 1.225 | | 22.6 | 20.0 | 12.9 | 50.0 |
| Perfluoroheptanoic acid (PFHpA) | Ave | 0.9369 | 0.8814 | | 2.09 | 2.22 | -5.9 | 50.0 |
| Perfluorohexanesulfonic acid (PFHxS) | Ave | 1.674 | 1.771 | | 7.05 | 6.67 | 5.8 | 50.0 |
| Perfluorooctanoic acid (PFOA) | Ave | 0.9258 | 0.8987 | | 4.32 | 4.45 | -2.9 | 50.0 |
| Perfluorooctanesulfonic acid (PFOS) | Ave | 0.9389 | 0.9280 | | 8.79 | 8.89 | -1.2 | 50.0 |
| Perfluorononanoic acid (PFNA) | Ave | 0.6642 | 0.6110 | | 4.09 | 4.45 | -8.0 | 50.0 |
| 13C2 PFHxA | Ave | 1.100 | 1.093 | | 9.93 | 10.0 | -0.7 | 30.0 |
| 13C2 PFDA | Ave | 0.7652 | 0.7211 | | 9.42 | 10.0 | -5.8 | 30.0 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171218-51859.b\2017.12.18_537A_004.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 18-Dec-2017 09:53:44 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\20171218-51859.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 18-Dec-2017 10:46:47 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: XAWRK048

First Level Reviewer: hannigana Date: 18-Dec-2017 10:44:54

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.373 | 1.444 | -0.071 | 1.000 | 2729426 | 22.6 | | 8493 | |
| 298.90 > 99.00 | 1.373 | 1.444 | -0.071 | 1.000 | 1995107 | | 1.37(0.00-0.00) | 5994 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.495 | 1.573 | -0.078 | 1.000 | 1752451 | 9.93 | | 9446 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.646 | 1.725 | -0.079 | 1.000 | 1315510 | 7.05 | | 5027 | |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.646 | 1.725 | -0.079 | 1.000 | 314078 | 2.09 | | 133 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.851 | 1.913 | -0.062 | | 1603154 | 10.0 | | 7883 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.851 | 1.914 | -0.063 | 1.000 | 640876 | 4.32 | | 222 | |
| 413.00 > 169.00 | 1.851 | 1.914 | -0.063 | 1.000 | 363928 | | 1.76(0.00-0.00) | 1015 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.117 | 2.064 | 0.053 | 1.000 | 919133 | 8.79 | | 1023 | M |
| 499.00 > 99.00 | 2.117 | 2.064 | 0.053 | 1.000 | 192468 | | 4.78(0.00-0.00) | 898 | M |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.117 | 2.151 | -0.034 | | 3194742 | 28.7 | | 10833 | |
| 9 Perfluorononanoic acid | | | | | | | | | |
| 463.00 > 419.00 | 2.124 | 2.158 | -0.034 | 1.000 | 435412 | 4.09 | | 194 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.276 | 2.312 | -0.036 | 1.000 | 1156005 | 9.42 | | 8096 | |

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00020

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171218-51859.b\2017.12.18_537A_004.d

Injection Date: 18-Dec-2017 09:53:44

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

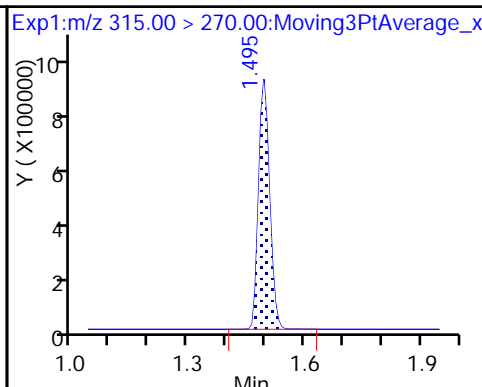
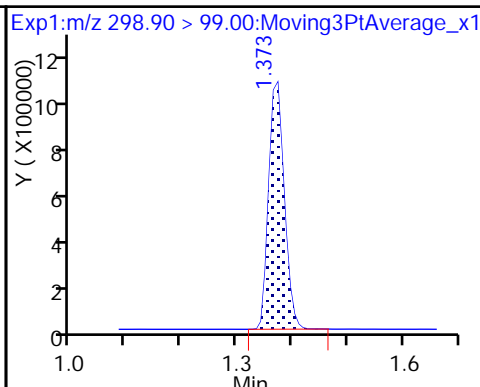
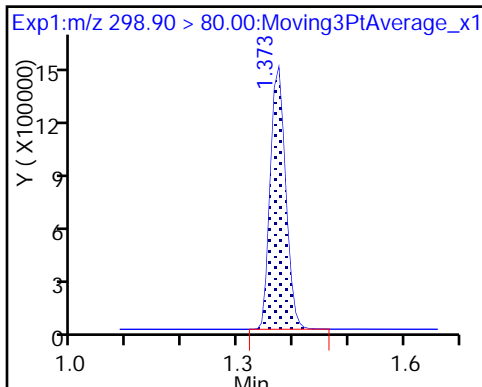
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

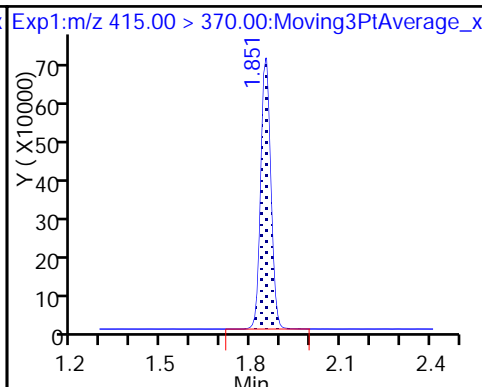
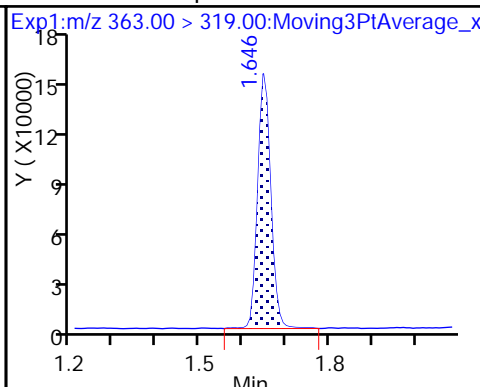
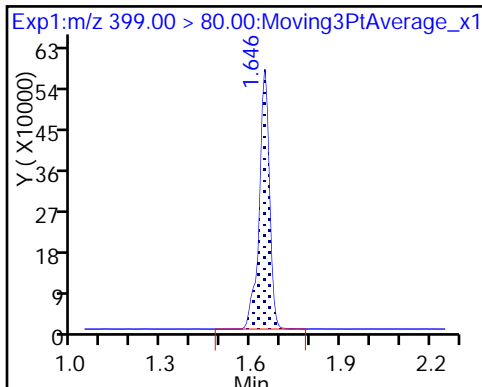
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

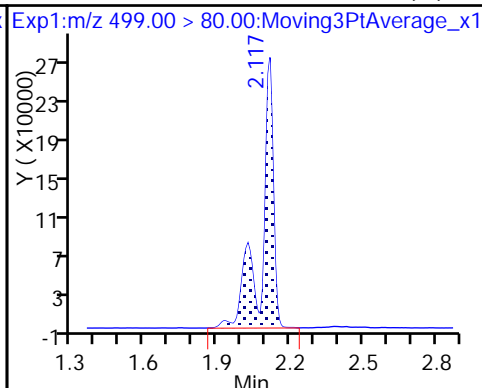
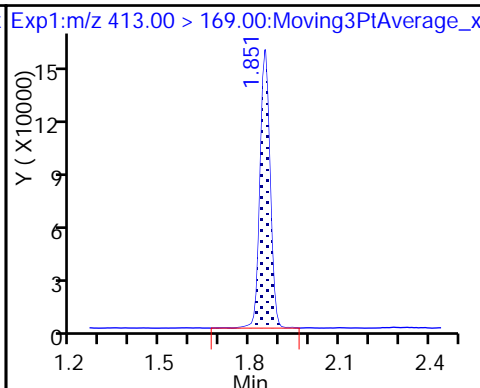
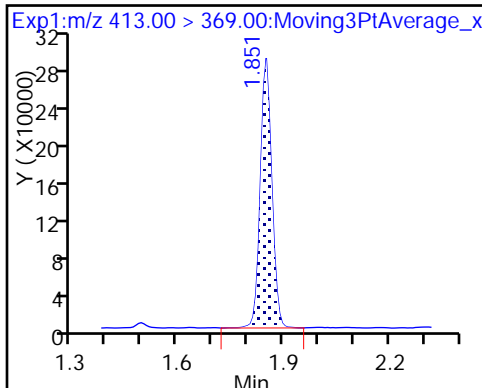
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

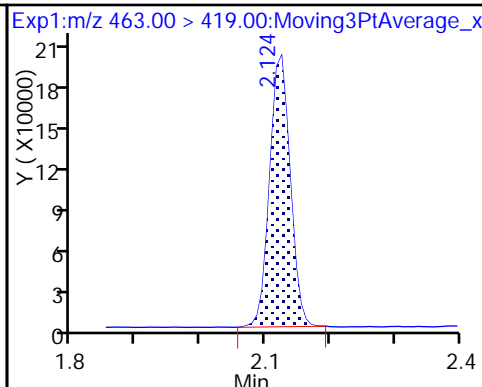
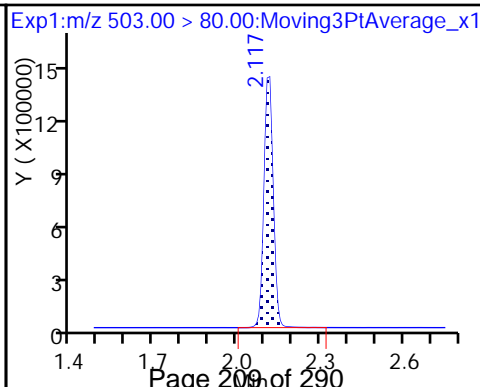
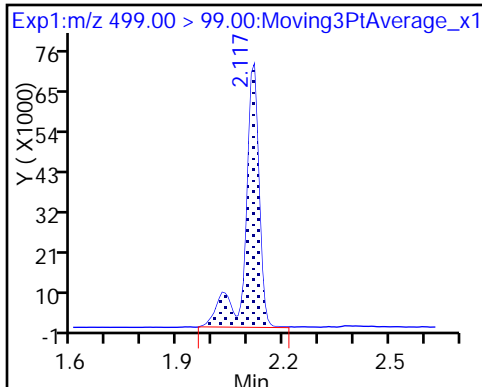
8 Perfluorooctane sulfonic acid (M)



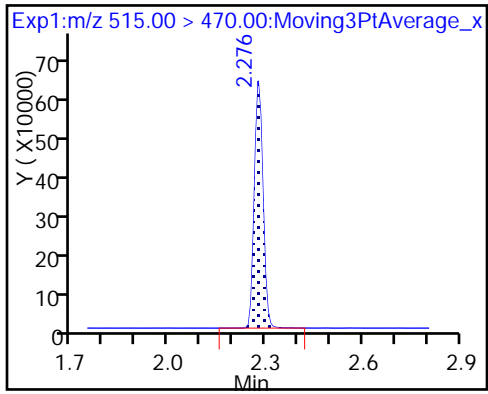
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

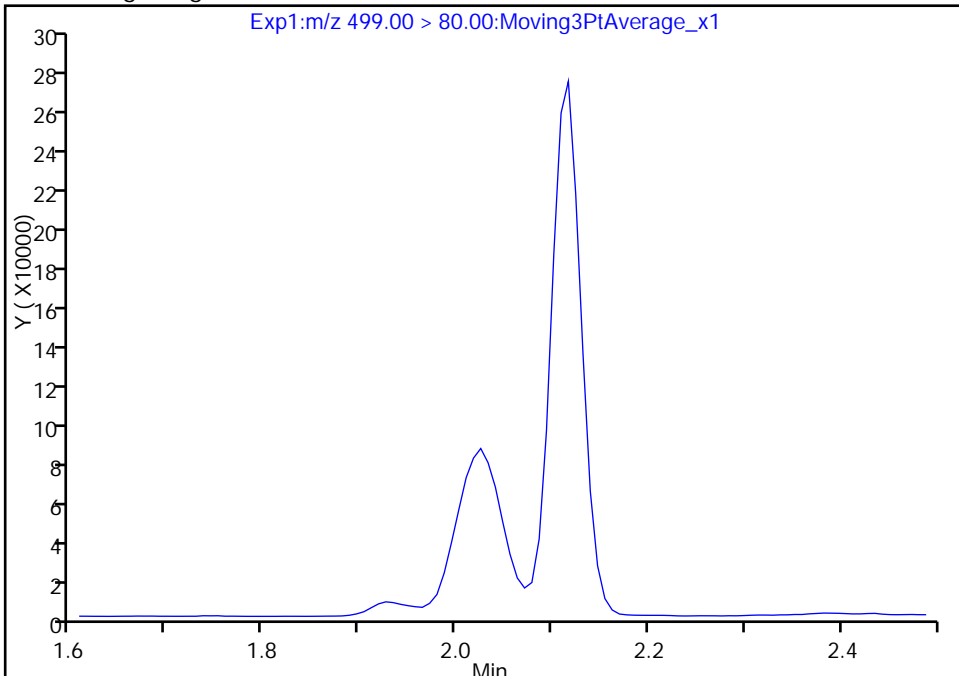
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171218-51859.b\2017.12.18_537A_004.d
Injection Date: 18-Dec-2017 09:53:44 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

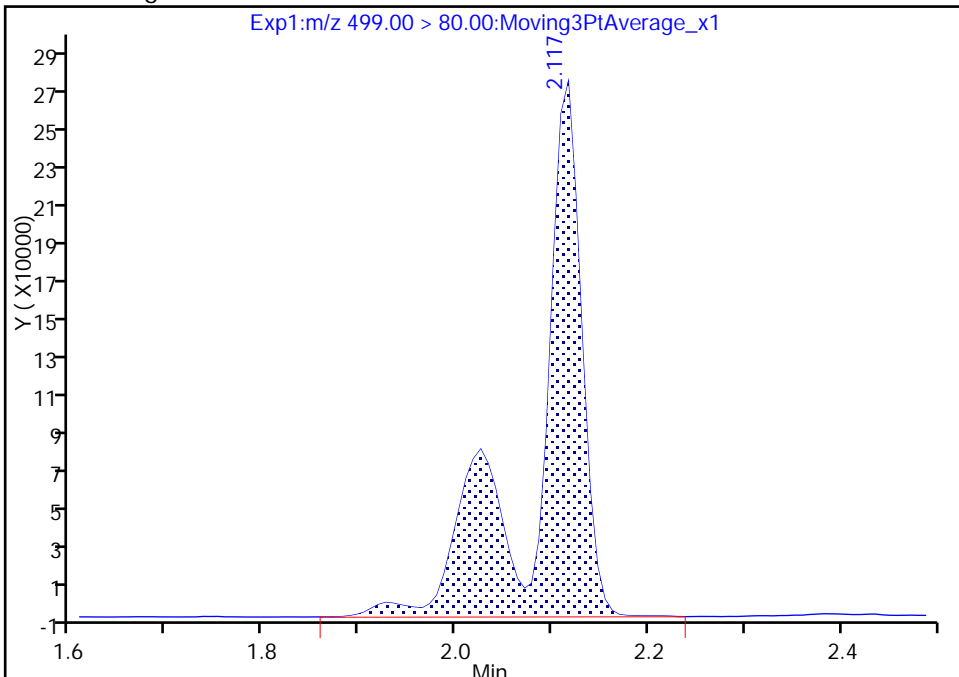
Not Detected
Expected RT: 2.06

Processing Integration Results



RT: 2.12
Area: 919133
Amount: 8.787794
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 18-Dec-2017 10:44:27
Audit Action: Manually Integrated

TestAmerica Sacramento

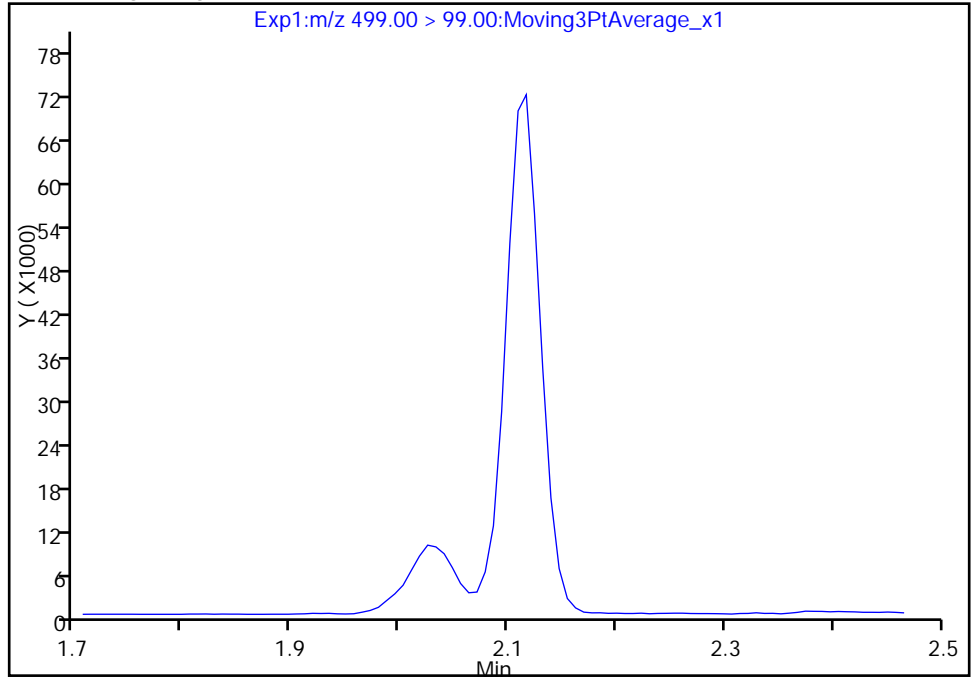
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171218-51859.b\2017.12.18_537A_004.d
Injection Date: 18-Dec-2017 09:53:44 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

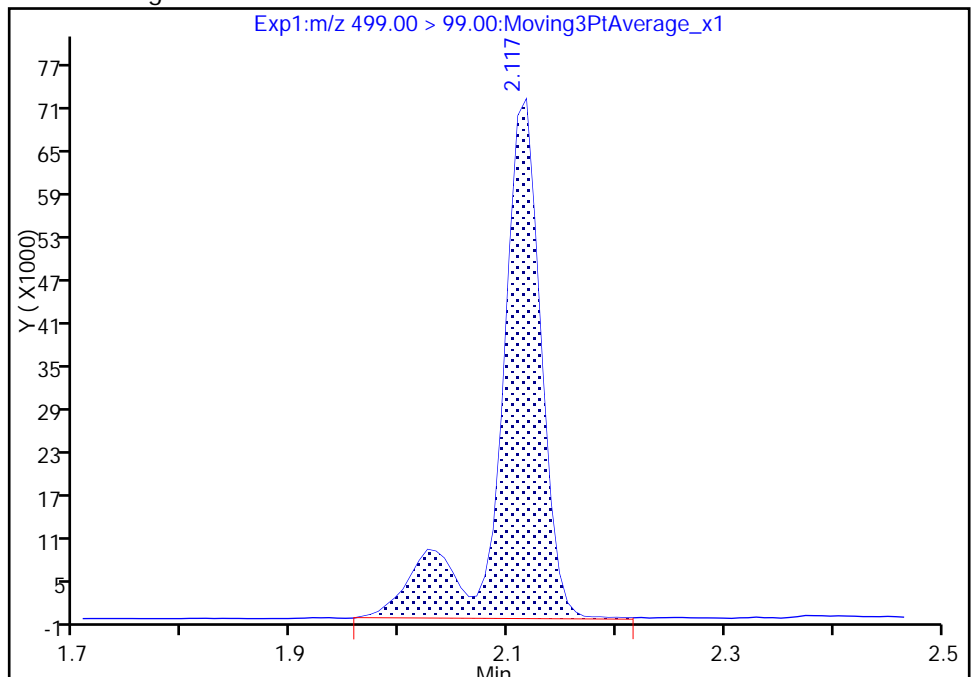
Not Detected
Expected RT: 2.06

Processing Integration Results



Manual Integration Results

RT: 2.12
Area: 192468
Amount: 8.787794
Amount Units: ng/ml



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Lab Sample ID: CCV 320-200646/1 Calibration Date: 12/19/2017 20:31
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.19_537A_050.d Conc. Units: ng/mL

| ANALYTE | CURVE TYPE | AVE RRF | RRF | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D | MAX %D |
|--------------------------------------|------------|---------|--------|---------|-------------|--------------|------|--------|
| Perfluorobutanesulfonic acid (PFBS) | QuaF | | 0.9623 | | 144 | 135 | 6.4 | 30.0 |
| Perfluoroheptanoic acid (PFHpA) | Ave | 0.9369 | 0.9524 | | 15.3 | 15.0 | 1.6 | 30.0 |
| Perfluorohexanesulfonic acid (PFHxS) | Ave | 1.674 | 1.793 | | 48.2 | 45.0 | 7.1 | 30.0 |
| Perfluorooctanoic acid (PFOA) | Ave | 0.9258 | 0.8880 | | 28.8 | 30.0 | -4.1 | 30.0 |
| Perfluorooctanesulfonic acid (PFOS) | Ave | 0.9389 | 0.9364 | | 59.9 | 60.0 | -0.3 | 30.0 |
| Perfluorononanoic acid (PFNA) | Ave | 0.6642 | 0.6144 | | 27.8 | 30.0 | -7.5 | 30.0 |
| 13C2 PFHxA | Ave | 1.100 | 1.132 | | 10.3 | 10.0 | 2.9 | 30.0 |
| 13C2 PFDA | Ave | 0.7652 | 0.7335 | | 9.58 | 10.0 | -4.2 | 30.0 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_050.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 19-Dec-2017 20:31:10 ALS Bottle#: 5 Worklist Smp#: 1
 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\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:18:37

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.366 | 1.444 | -0.078 | 1.000 | 14027603 | 143.7 | | 17136 | |
| 298.90 > 99.00 | 1.358 | 1.444 | -0.086 | 0.994 | 10960418 | | 1.28(0.00-0.00) | 16736 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.479 | 1.573 | -0.094 | 1.000 | 1693100 | 10.3 | | 11030 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.624 | 1.725 | -0.101 | 1.000 | 8711333 | 48.2 | | 11704 | |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.624 | 1.725 | -0.101 | 1.000 | 2137582 | 15.3 | | 804 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.806 | 1.913 | -0.107 | | 1495978 | 10.0 | | 7107 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.806 | 1.914 | -0.108 | 1.000 | 3988613 | 28.8 | | 786 | |
| 413.00 > 169.00 | 1.806 | 1.914 | -0.108 | 1.000 | 2182453 | | 1.83(0.00-0.00) | 6364 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.064 | 2.071 | -0.007 | 1.000 | 6067740 | 59.9 | | 1245 | M |
| 499.00 > 99.00 | 2.064 | 2.071 | -0.007 | 1.000 | 1264920 | | 4.80(0.00-0.00) | 1511 | M |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.064 | 2.151 | -0.087 | | 3096651 | 28.7 | | 10382 | |
| 9 Perfluorononanoic acid | | | | | | | | | |
| 463.00 > 419.00 | 2.071 | 2.158 | -0.087 | 1.000 | 2757981 | 27.8 | | 916 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.246 | 2.312 | -0.066 | 1.000 | 1097220 | 9.58 | | 8074 | |

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\20171220-51953.b\2017.12.19_537A_050.d

Injection Date: 19-Dec-2017 20:31:10

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

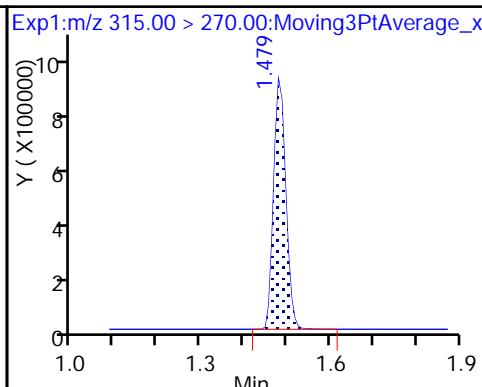
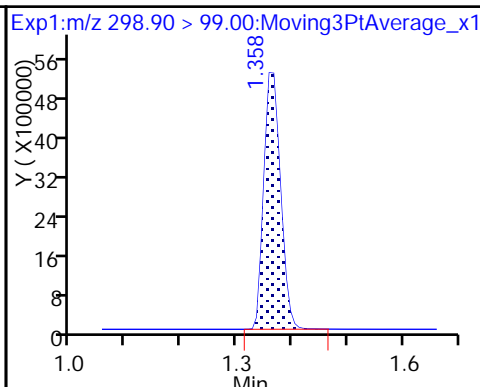
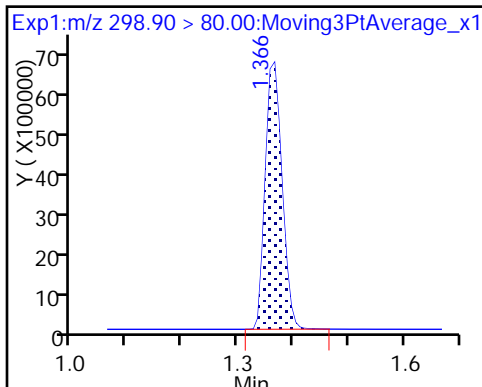
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

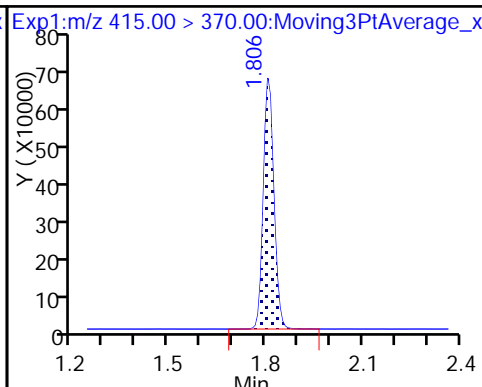
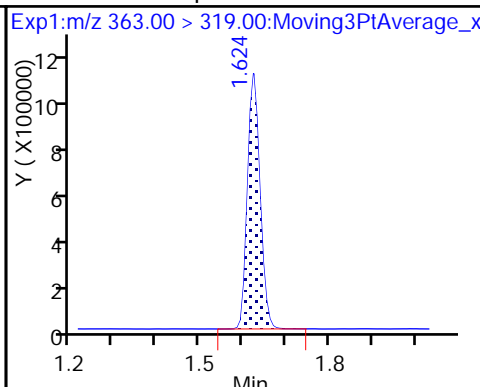
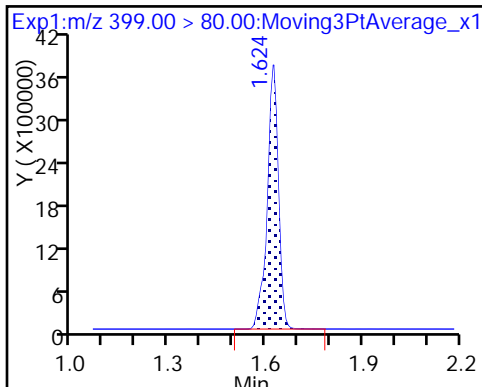
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

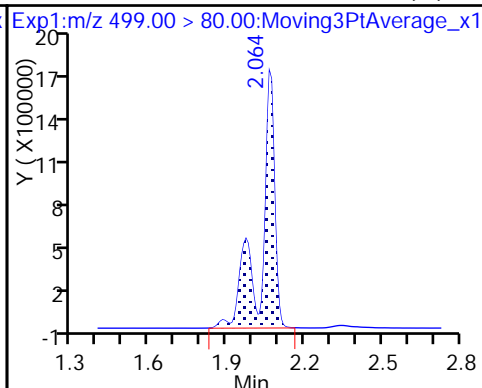
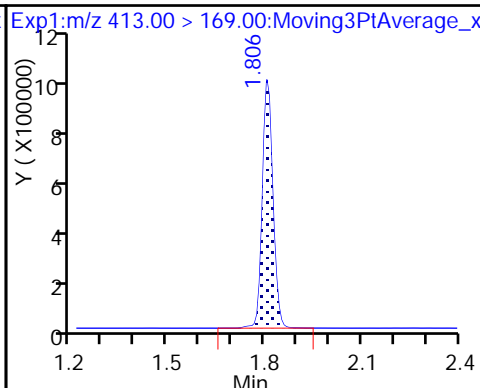
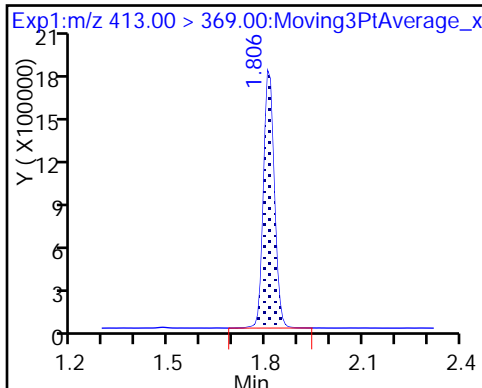
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

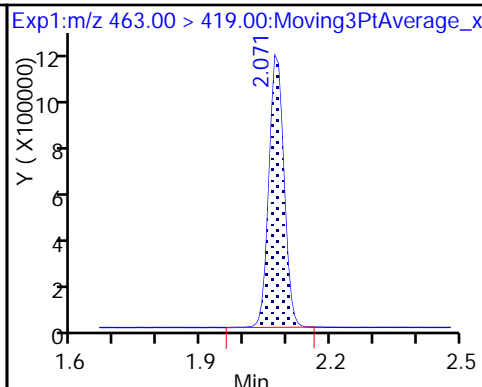
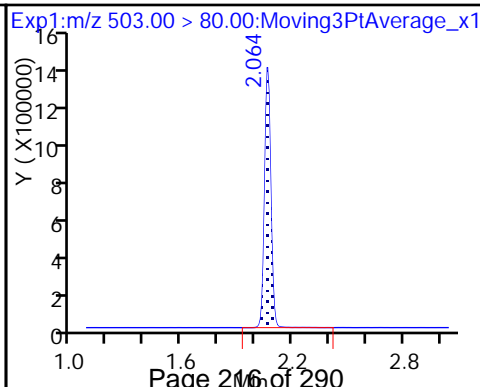
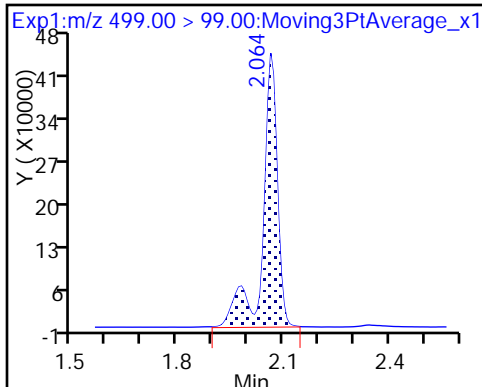
8 Perfluorooctane sulfonic acid (M)



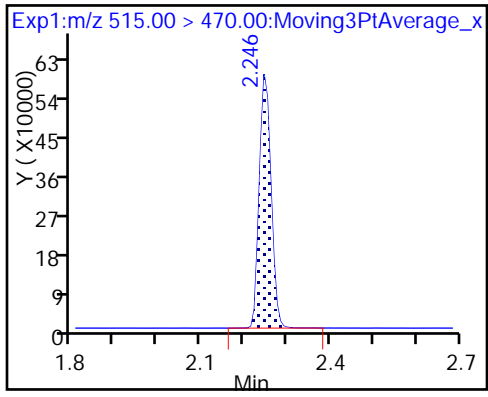
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

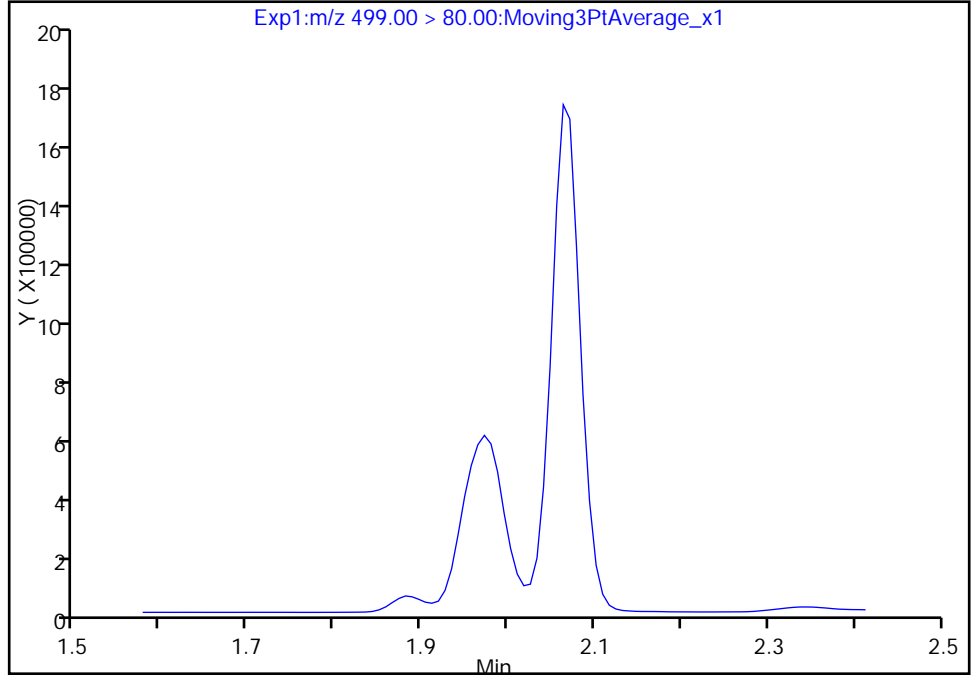
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Injection Date: 19-Dec-2017 20:31:10 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

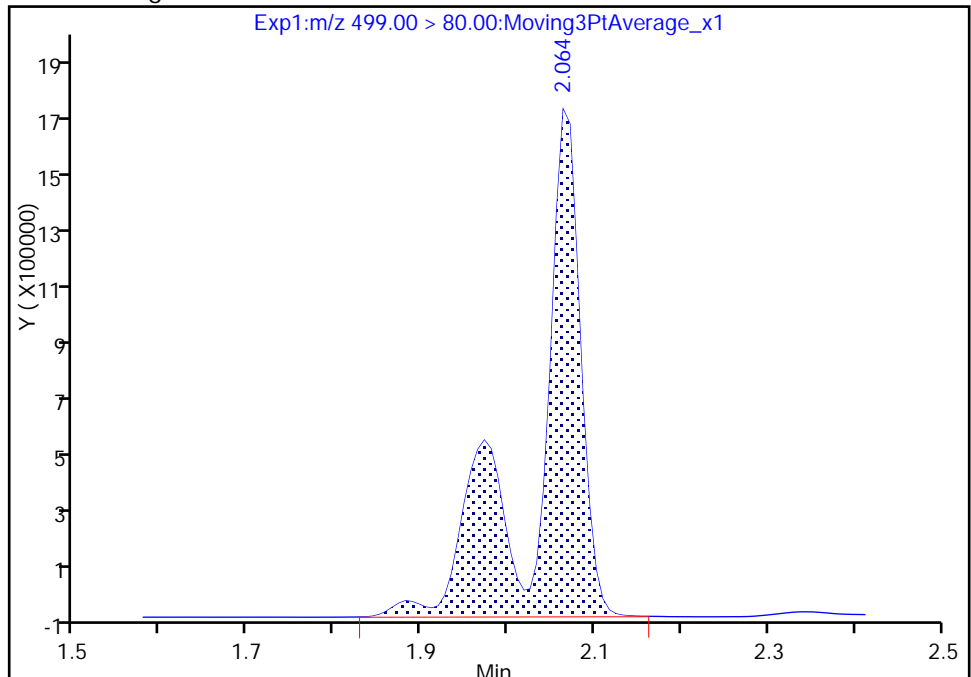
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 6067740
Amount: 59.851079
Amount Units: ng/ml



TestAmerica Sacramento

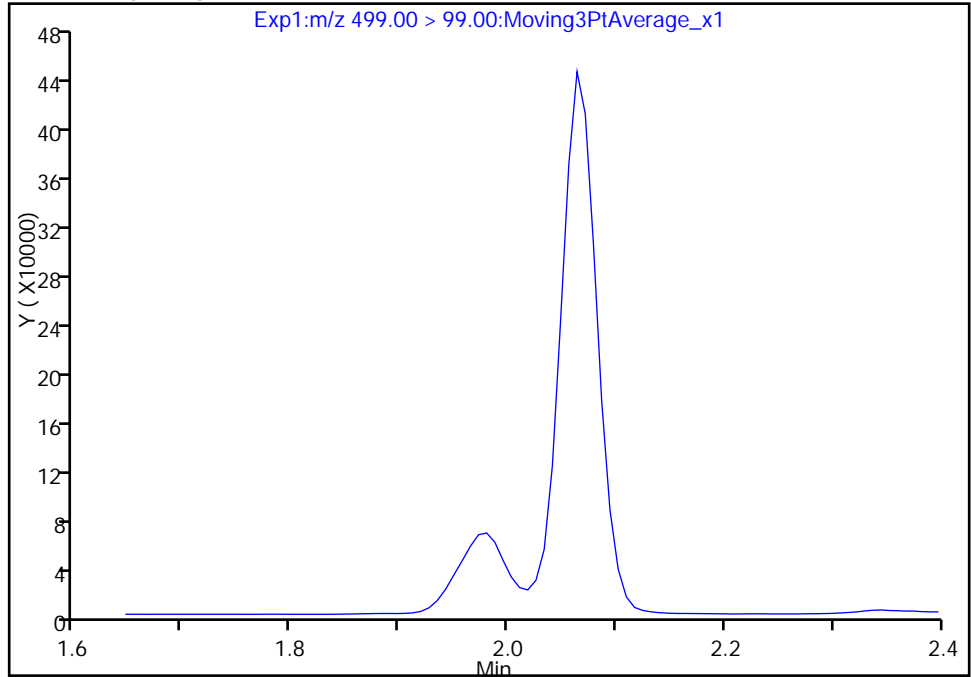
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_050.d
Injection Date: 19-Dec-2017 20:31:10 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

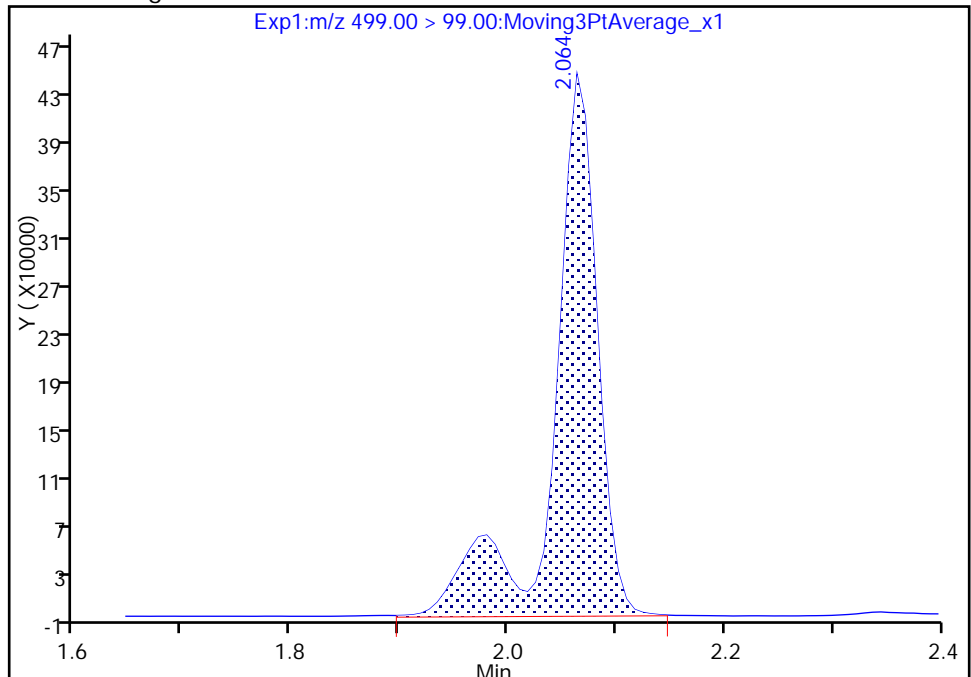
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 1264920
Amount: 59.851079
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:18:28

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

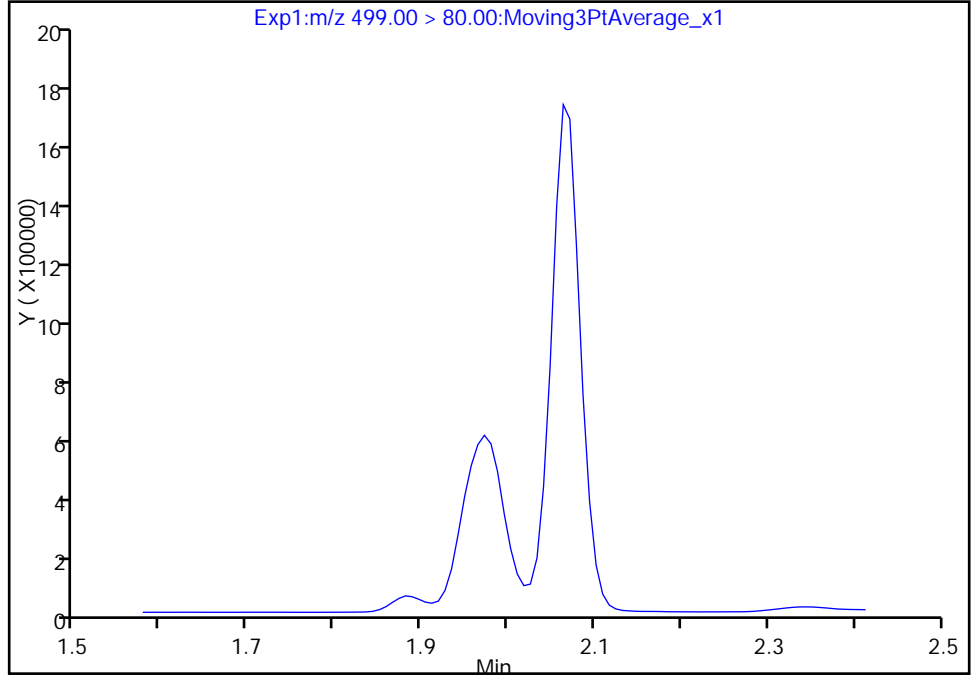
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_050.d
Injection Date: 19-Dec-2017 20:31:10 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

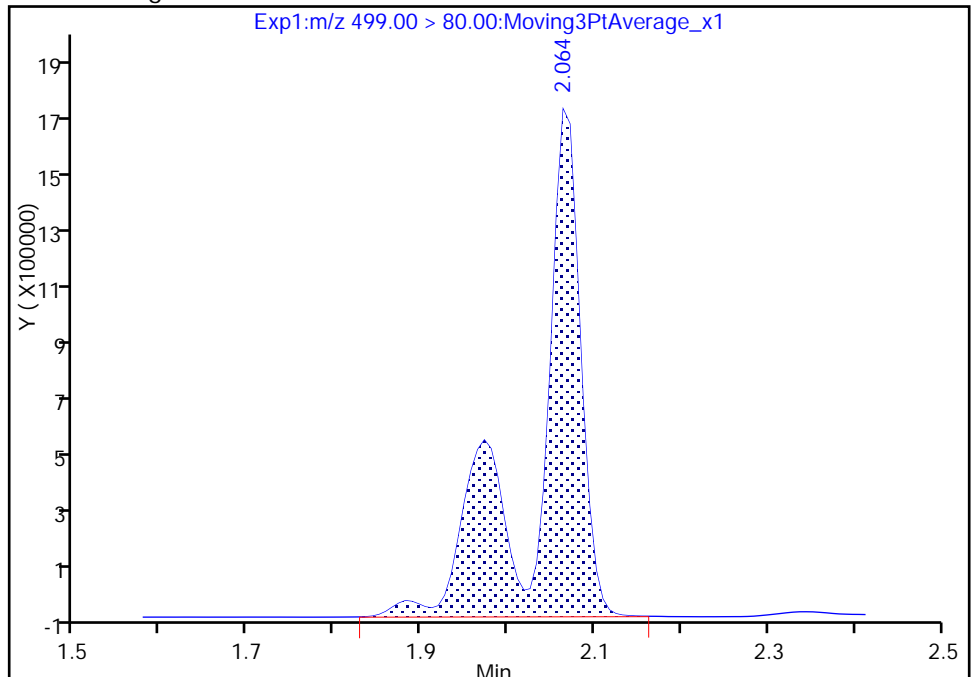
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 6067740
Amount: 59.851079
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:18:28

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Lab Sample ID: CCV 320-200646/13 Calibration Date: 12/19/2017 21:27
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.19_537A_062.d Conc. Units: ng/mL

| ANALYTE | CURVE TYPE | AVE RRF | RRF | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D | MAX %D |
|--------------------------------------|------------|---------|--------|---------|-------------|--------------|------|--------|
| Perfluorobutanesulfonic acid (PFBS) | QuaF | | 1.111 | | 47.7 | 45.0 | 6.0 | 30.0 |
| Perfluoroheptanoic acid (PFHpA) | Ave | 0.9369 | 0.9480 | | 5.06 | 5.00 | 1.2 | 30.0 |
| Perfluorohexanesulfonic acid (PFHxS) | Ave | 1.674 | 1.748 | | 15.7 | 15.0 | 4.4 | 30.0 |
| Perfluorooctanoic acid (PFOA) | Ave | 0.9258 | 0.8955 | | 9.68 | 10.0 | -3.3 | 30.0 |
| Perfluorooctanesulfonic acid (PFOS) | Ave | 0.9389 | 0.9133 | | 19.5 | 20.0 | -2.7 | 30.0 |
| Perfluorononanoic acid (PFNA) | Ave | 0.6642 | 0.6453 | | 9.72 | 10.0 | -2.8 | 30.0 |
| 13C2 PFHxA | Ave | 1.100 | 1.148 | | 10.4 | 10.0 | 4.3 | 30.0 |
| 13C2 PFDA | Ave | 0.7652 | 0.7191 | | 9.40 | 10.0 | -6.0 | 30.0 |

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Lab Sample ID: CCV 320-200767/13 Calibration Date: 12/19/2017 21:27
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.19_537A_062.d Conc. Units: ng/mL

| ANALYTE | CURVE TYPE | AVE RRF | RRF | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D | MAX %D |
|--------------------------------------|------------|---------|--------|---------|-------------|--------------|------|--------|
| Perfluorobutanesulfonic acid (PFBS) | QuaF | | 1.111 | | 47.7 | 45.0 | 6.0 | 30.0 |
| Perfluoroheptanoic acid (PFHpA) | Ave | 0.9369 | 0.9480 | | 5.06 | 5.00 | 1.2 | 30.0 |
| Perfluorohexanesulfonic acid (PFHxS) | Ave | 1.674 | 1.748 | | 15.7 | 15.0 | 4.4 | 30.0 |
| Perfluorooctanoic acid (PFOA) | Ave | 0.9258 | 0.8955 | | 9.68 | 10.0 | -3.3 | 30.0 |
| Perfluorooctanesulfonic acid (PFOS) | Ave | 0.9389 | 0.9133 | | 19.5 | 20.0 | -2.7 | 30.0 |
| Perfluorononanoic acid (PFNA) | Ave | 0.6642 | 0.6453 | | 9.72 | 10.0 | -2.8 | 30.0 |
| 13C2 PFHxA | Ave | 1.100 | 1.148 | | 10.4 | 10.0 | 4.3 | 30.0 |
| 13C2 PFDA | Ave | 0.7652 | 0.7191 | | 9.40 | 10.0 | -6.0 | 30.0 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 19-Dec-2017 21:27:18 ALS Bottle#: 3 Worklist Smp#: 13
 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\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:31 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:19:17

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.366 | 1.444 | -0.078 | 1.000 | 5511171 | 47.7 | | 11759 | |
| 298.90 > 99.00 | 1.366 | 1.444 | -0.078 | 1.000 | 4129321 | | 1.33(0.00-0.00) | 10392 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.479 | 1.573 | -0.094 | 1.000 | 1710730 | 10.4 | | 11594 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.624 | 1.725 | -0.101 | 1.000 | 2892254 | 15.7 | | 5179 | |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.624 | 1.725 | -0.101 | 1.000 | 706631 | 5.06 | | 274 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.806 | 1.913 | -0.107 | | 1490421 | 10.0 | | 8643 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.806 | 1.914 | -0.108 | 1.000 | 1335746 | 9.68 | | 266 | |
| 413.00 > 169.00 | 1.806 | 1.914 | -0.108 | 1.000 | 728951 | | 1.83(0.00-0.00) | 2721 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.064 | 2.071 | -0.007 | 1.000 | 2014489 | 19.5 | | 406 | M |
| 499.00 > 99.00 | 2.064 | 2.071 | -0.007 | 1.000 | 418104 | | 4.82(0.00-0.00) | 480 | M |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.064 | 2.151 | -0.087 | | 3162377 | 28.7 | | 8557 | |
| 9 Perfluorononanoic acid | | | | | | | | | |
| 463.00 > 419.00 | 2.071 | 2.158 | -0.087 | 1.000 | 961975 | 9.72 | | 312 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.246 | 2.312 | -0.066 | 1.000 | 1071804 | 9.40 | | 8243 | |

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00023

Amount Added: 1.00

Units: mL

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 19-Dec-2017 21:27:18 ALS Bottle#: 3 Worklist Smp#: 13
 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\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:31 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:19:17

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.366 | 1.444 | -0.078 | 1.000 | 5511171 | 47.7 | | 11759 | |
| 298.90 > 99.00 | 1.366 | 1.444 | -0.078 | 1.000 | 4129321 | | 1.33(0.00-0.00) | 10392 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.479 | 1.573 | -0.094 | 1.000 | 1710730 | 10.4 | | 11594 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.624 | 1.725 | -0.101 | 1.000 | 2892254 | 15.7 | | 5179 | |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.624 | 1.725 | -0.101 | 1.000 | 706631 | 5.06 | | 274 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.806 | 1.913 | -0.107 | | 1490421 | 10.0 | | 8643 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.806 | 1.914 | -0.108 | 1.000 | 1335746 | 9.68 | | 266 | |
| 413.00 > 169.00 | 1.806 | 1.914 | -0.108 | 1.000 | 728951 | | 1.83(0.00-0.00) | 2721 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.064 | 2.071 | -0.007 | 1.000 | 2014489 | 19.5 | | 406 | M |
| 499.00 > 99.00 | 2.064 | 2.071 | -0.007 | 1.000 | 418104 | | 4.82(0.00-0.00) | 480 | M |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.064 | 2.151 | -0.087 | | 3162377 | 28.7 | | 8557 | |
| 9 Perfluorononanoic acid | | | | | | | | | |
| 463.00 > 419.00 | 2.071 | 2.158 | -0.087 | 1.000 | 961975 | 9.72 | | 312 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.246 | 2.312 | -0.066 | 1.000 | 1071804 | 9.40 | | 8243 | |

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\20171220-51953.b\2017.12.19_537A_062.d

Injection Date: 19-Dec-2017 21:27:18

Instrument ID: A8_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

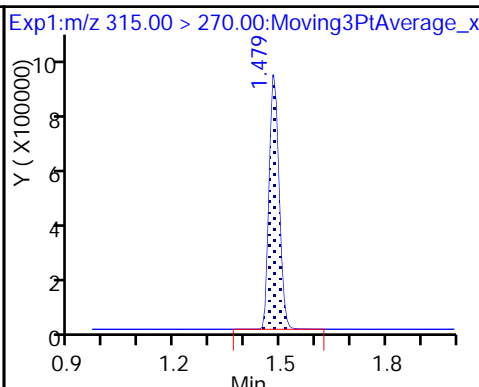
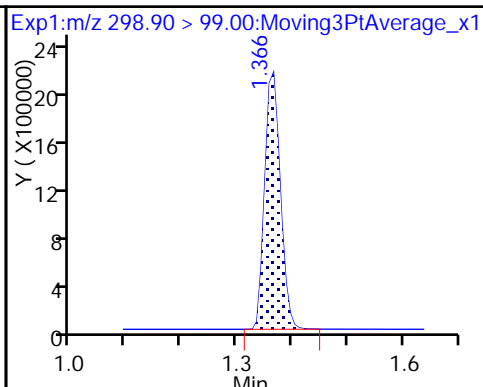
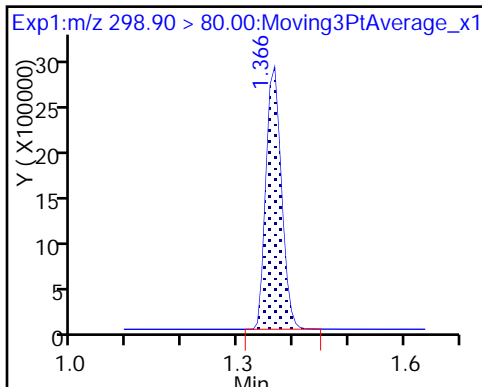
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

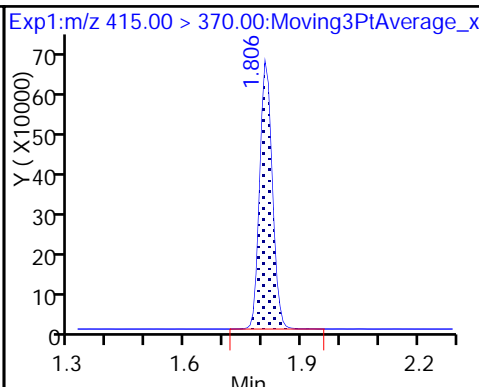
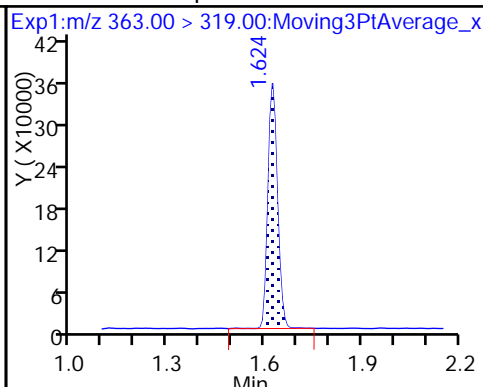
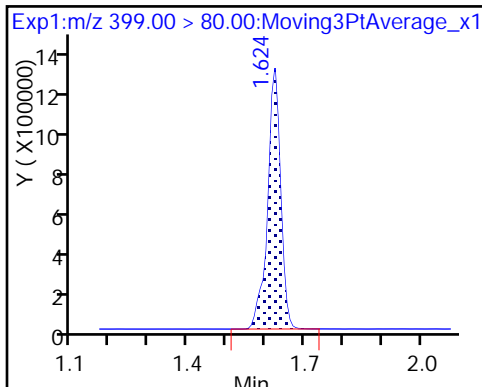
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

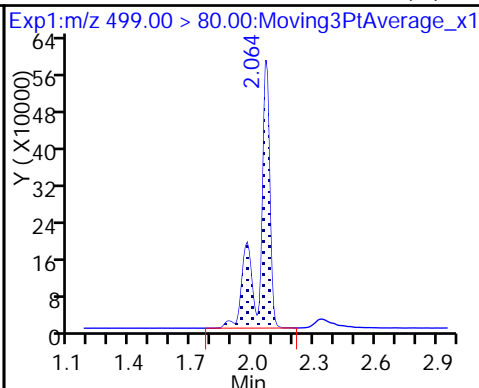
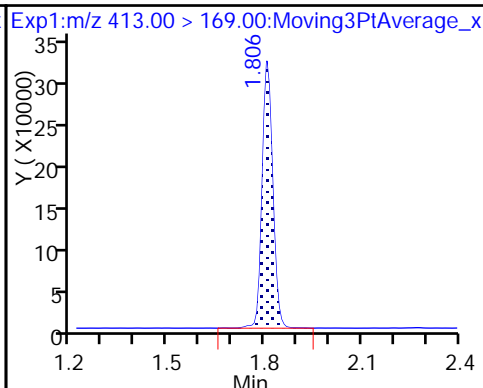
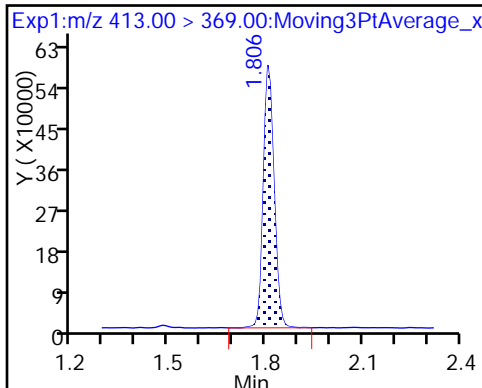
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

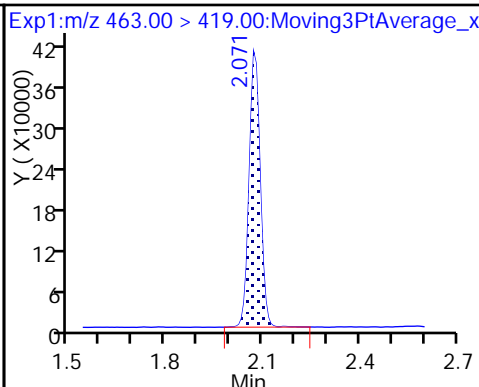
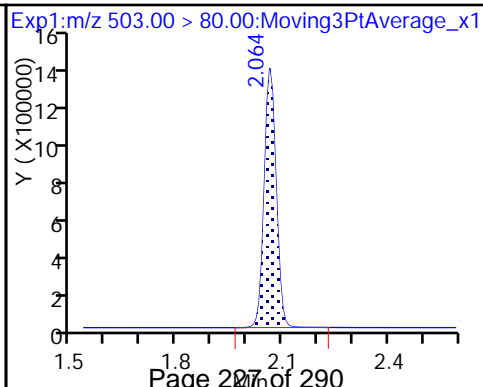
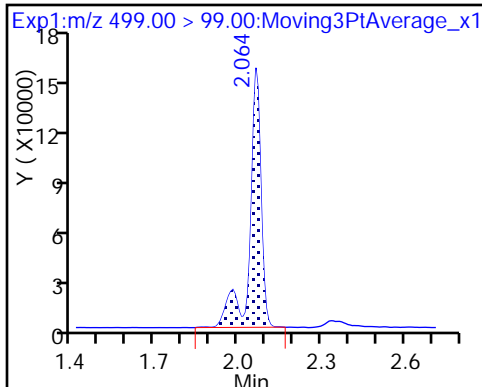
8 Perfluorooctane sulfonic acid (M)



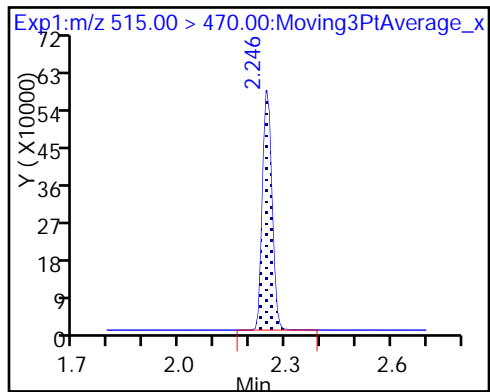
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d

Injection Date: 19-Dec-2017 21:27:18

Instrument ID: A8_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

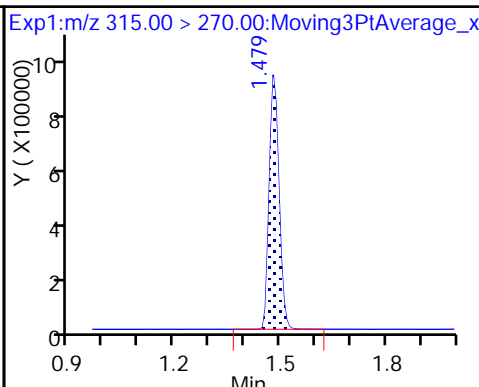
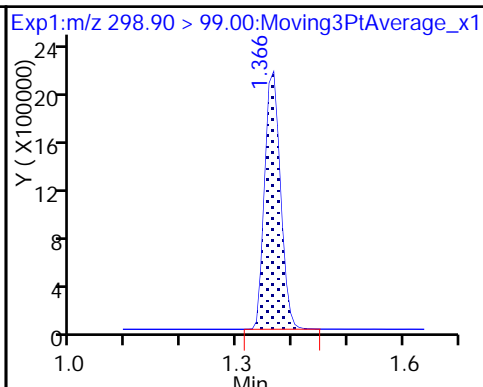
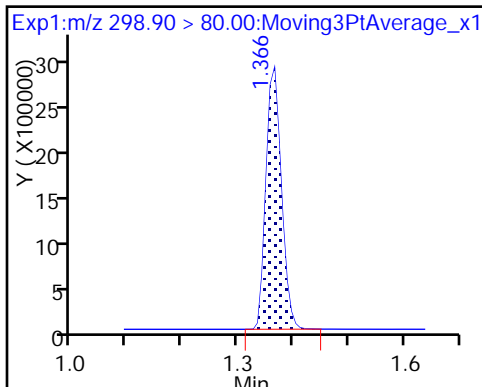
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

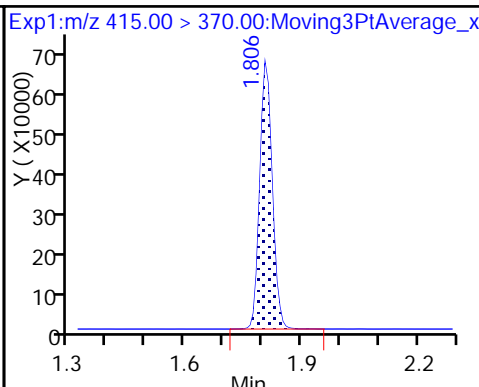
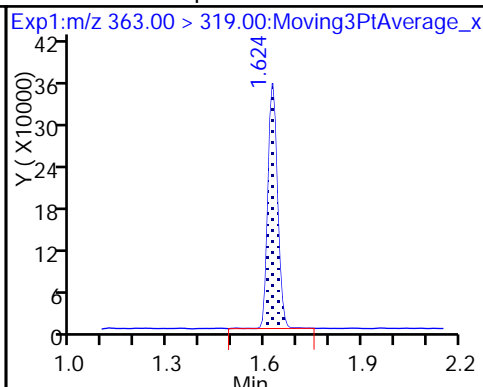
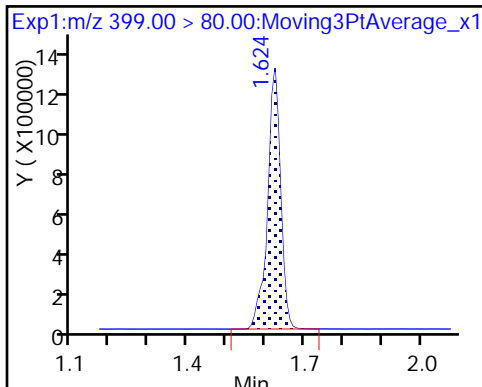
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

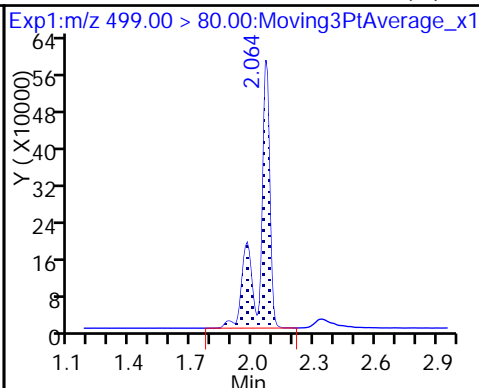
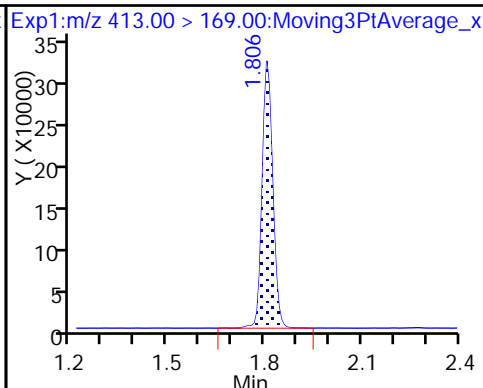
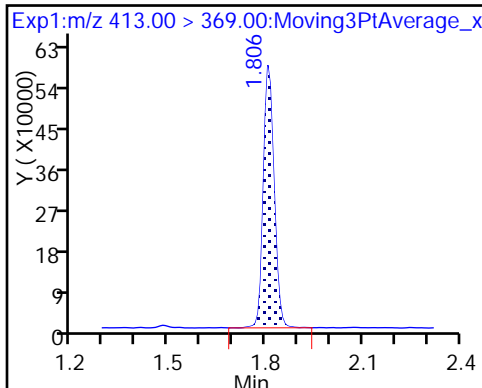
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

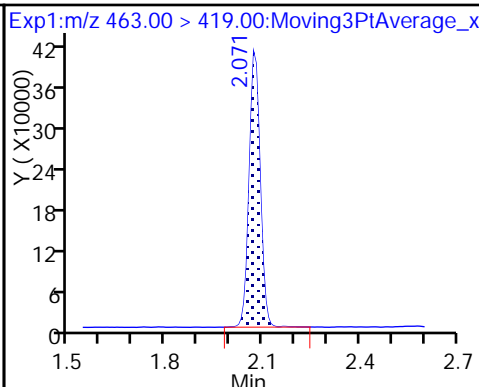
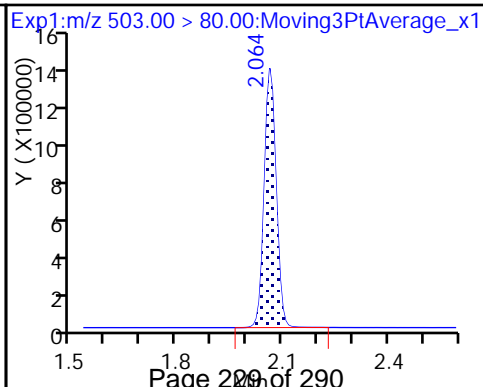
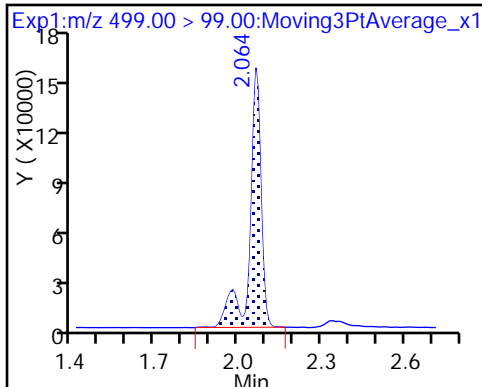
8 Perfluorooctane sulfonic acid (M)



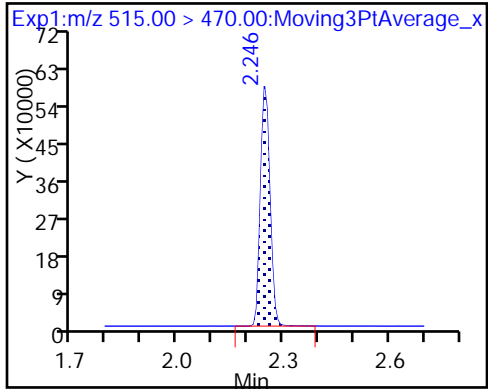
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

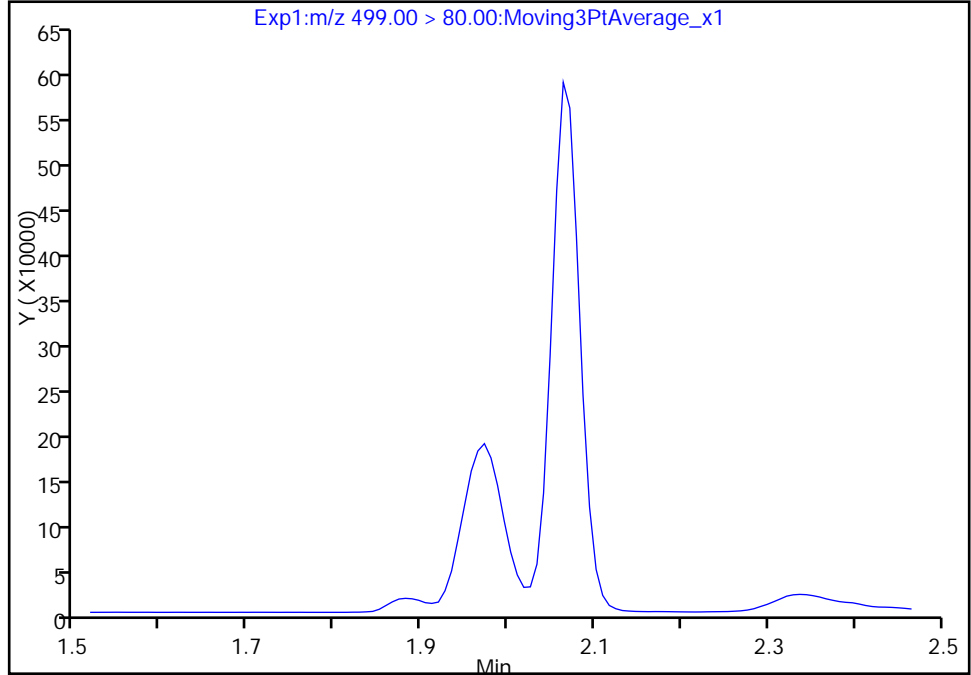
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Injection Date: 19-Dec-2017 21:27:18 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

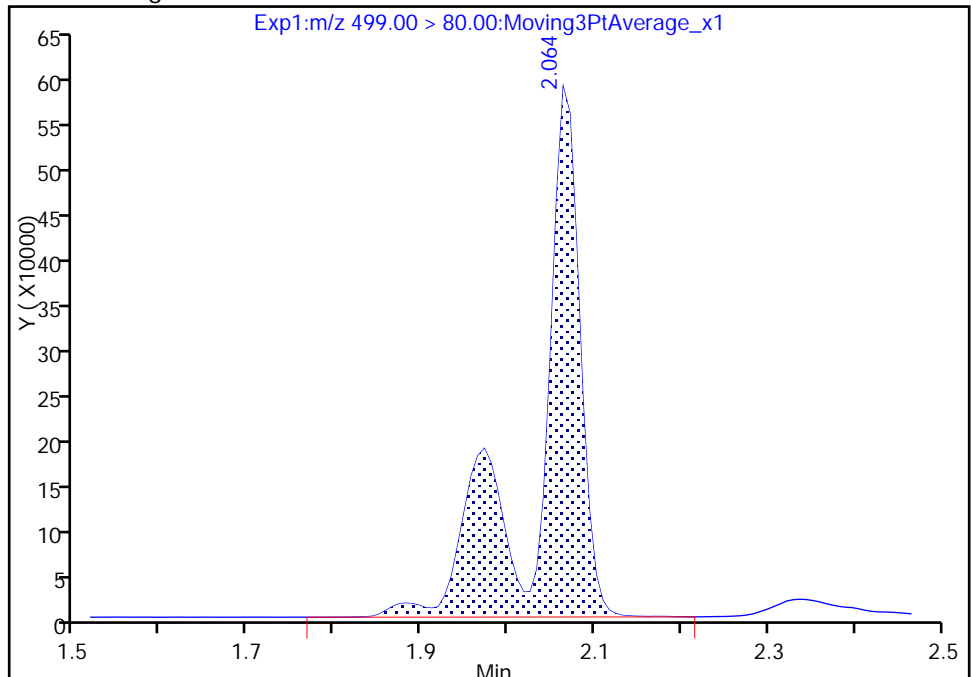
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 2014489
Amount: 19.457567
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:18:44
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

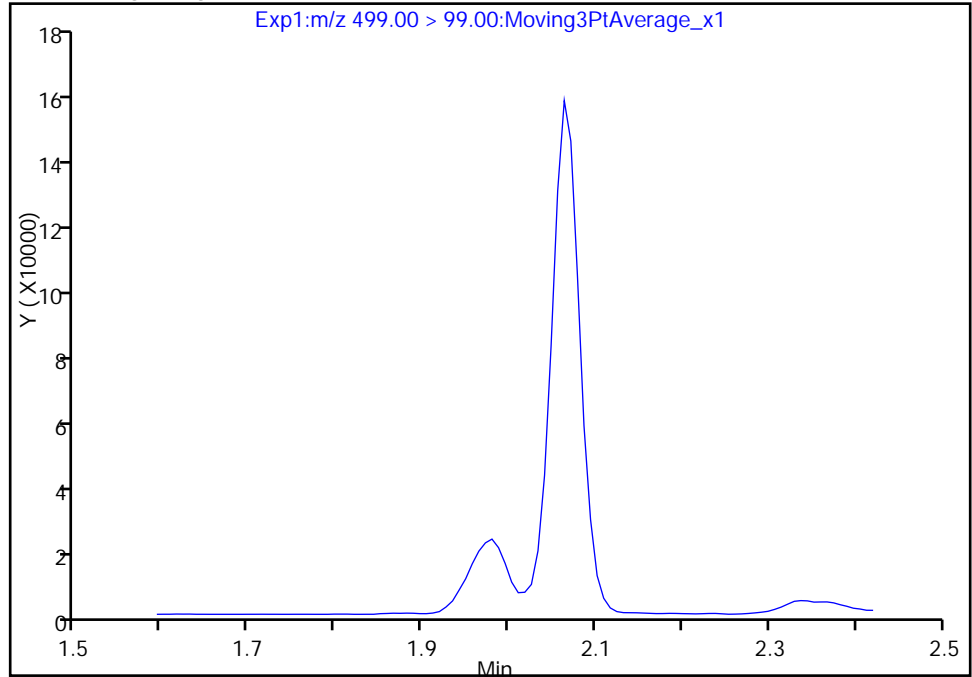
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d
Injection Date: 19-Dec-2017 21:27:18 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

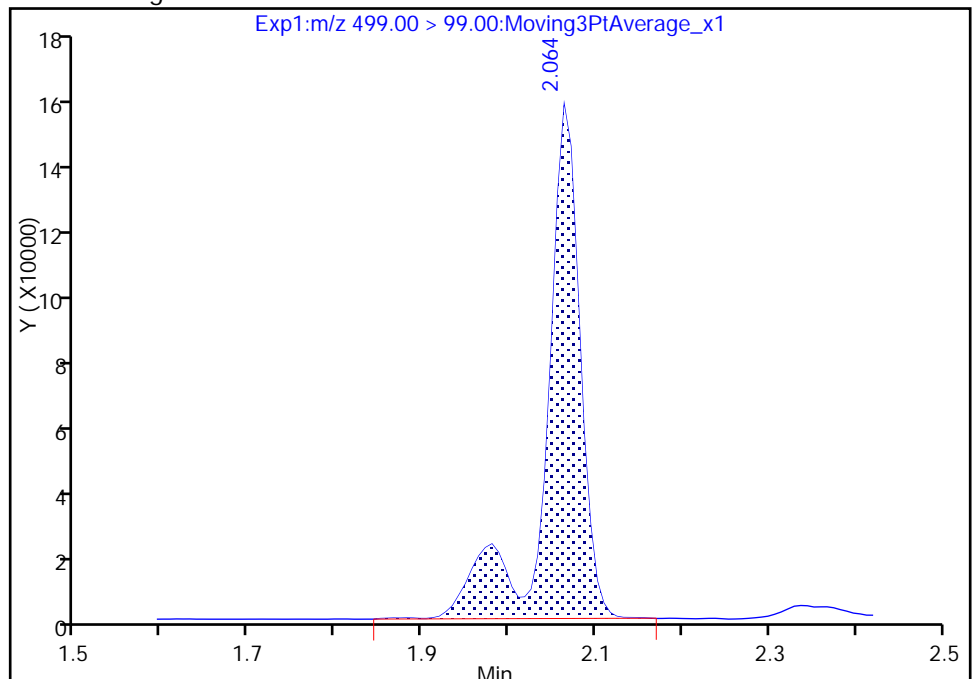
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 418104
Amount: 19.457567
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:19:02

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

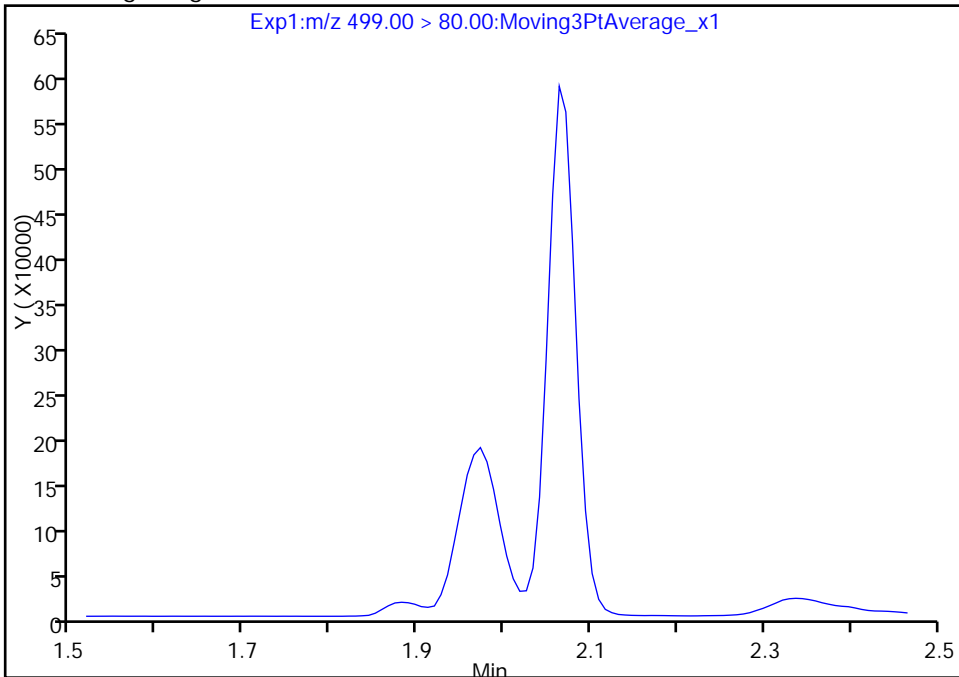
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d
Injection Date: 19-Dec-2017 21:27:18 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

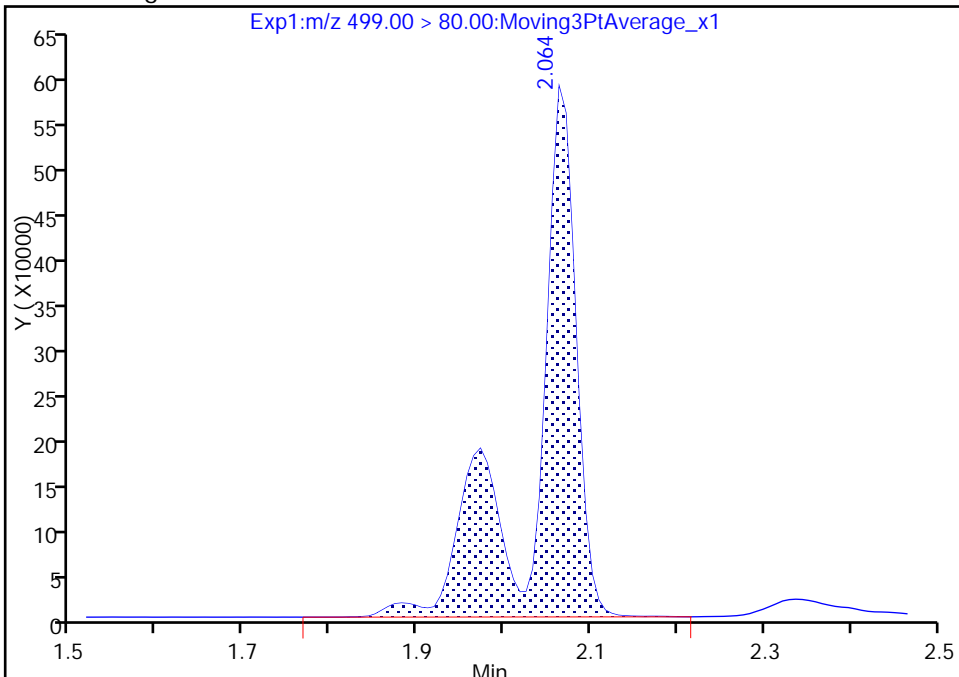
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 2014489
Amount: 19.457567
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:19:02

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

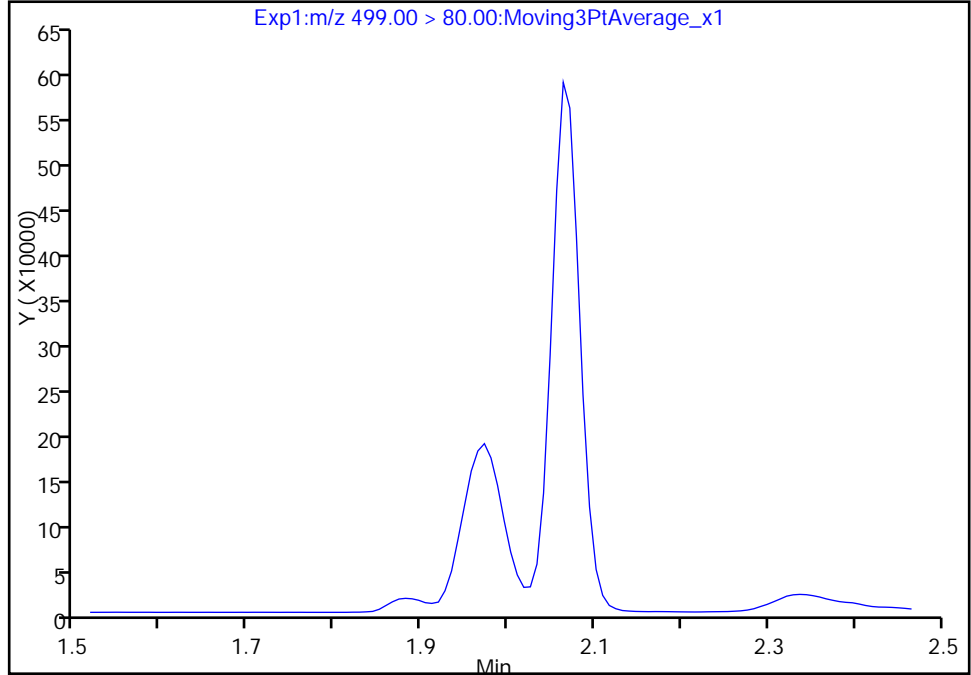
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d
Injection Date: 19-Dec-2017 21:27:18 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

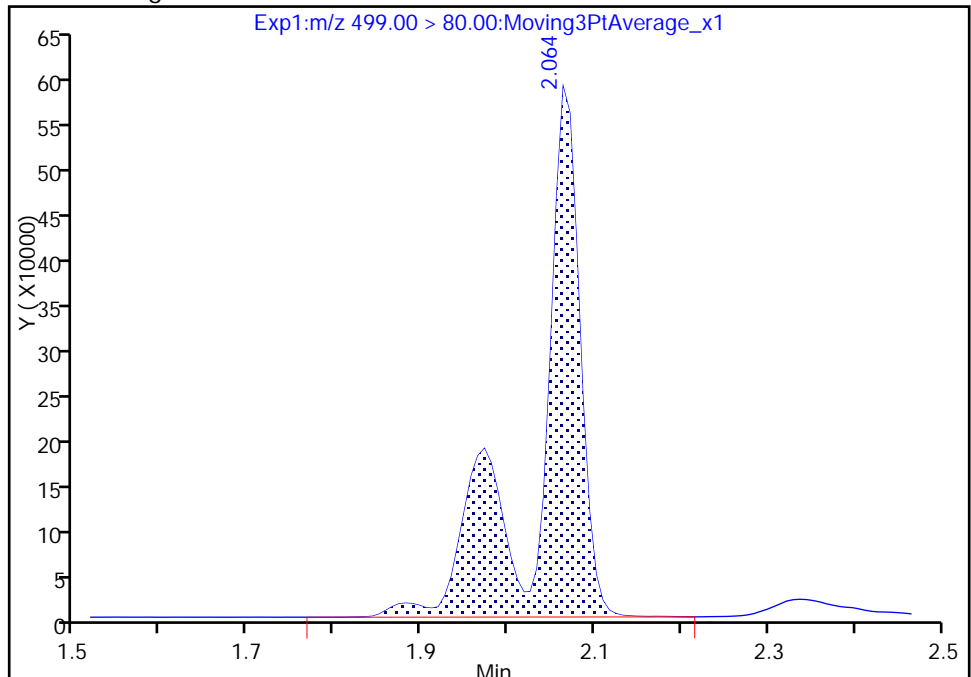
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 2014489
Amount: 19.457567
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:18:44
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

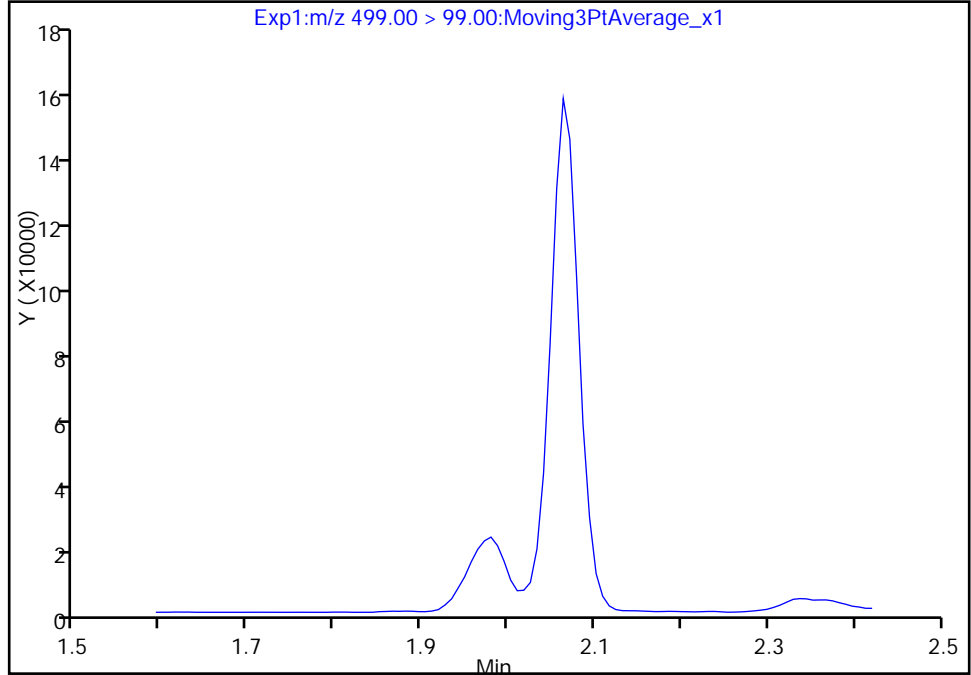
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d
Injection Date: 19-Dec-2017 21:27:18 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

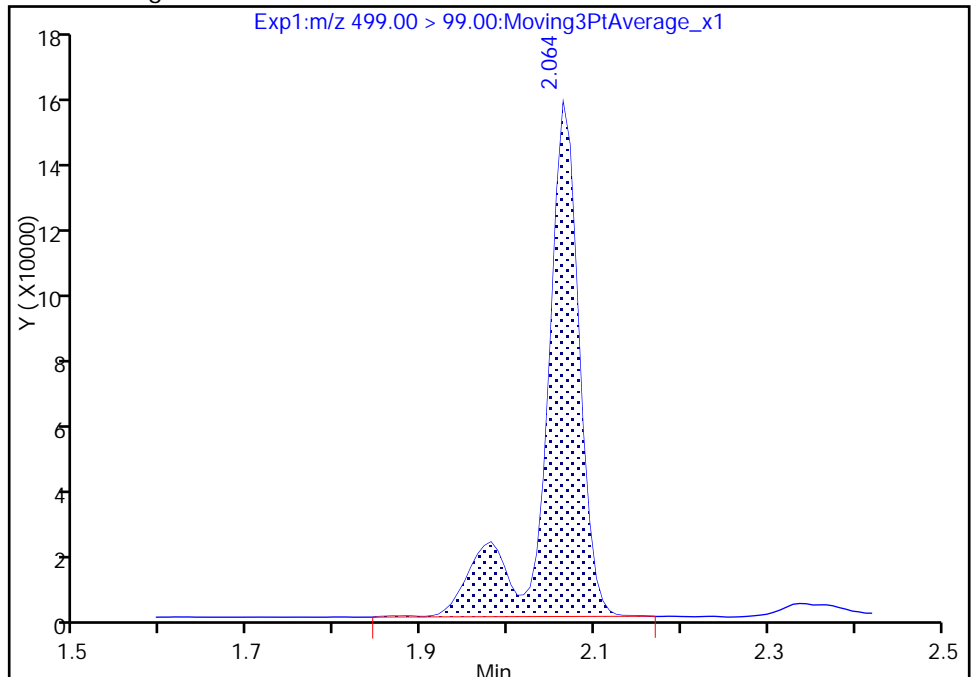
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 418104
Amount: 19.457567
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:19:02

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

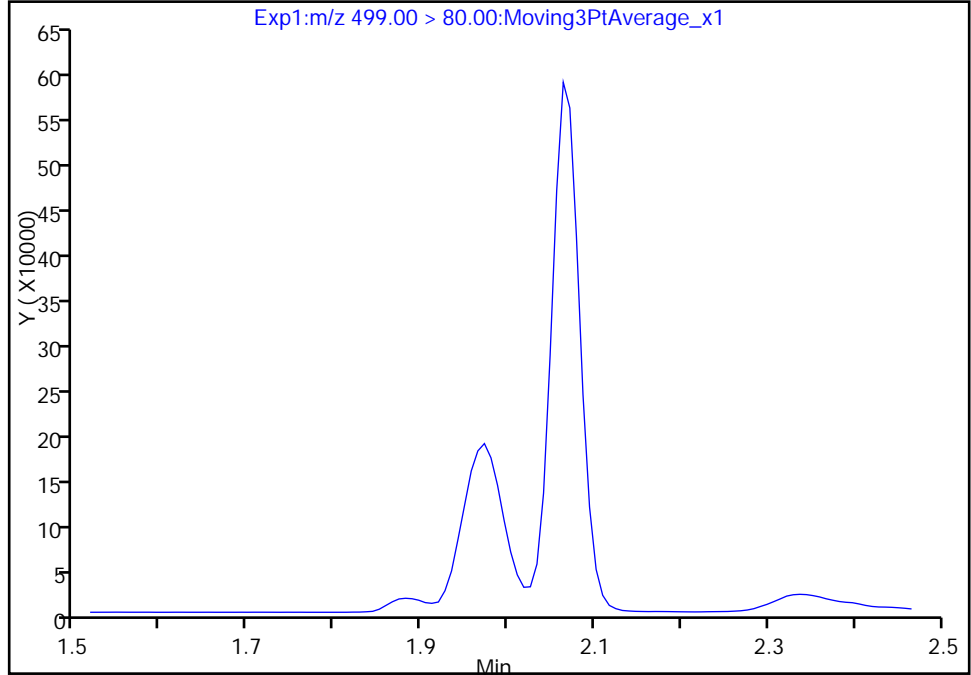
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d
Injection Date: 19-Dec-2017 21:27:18 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

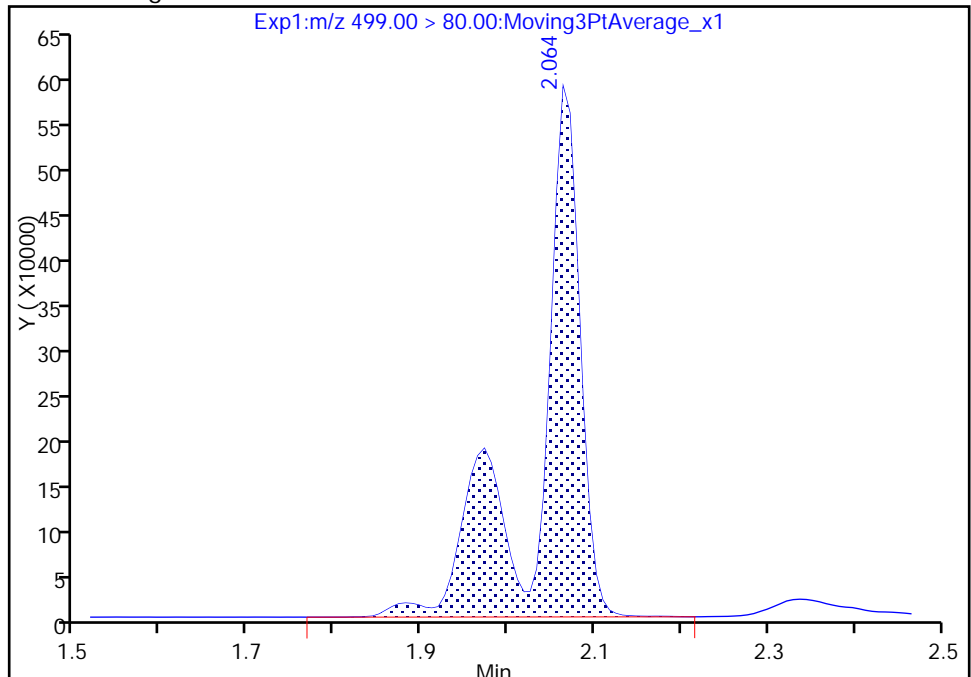
Not Detected
Expected RT: 2.07

Processing Integration Results



RT: 2.06
Area: 2014489
Amount: 19.457567
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 20-Dec-2017 14:19:02

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Lab Sample ID: CCV 320-200767/21 Calibration Date: 12/19/2017 22:04
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.19_537A_070.d Conc. Units: ng/mL

| ANALYTE | CURVE TYPE | AVE RRF | RRF | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D | MAX %D |
|--------------------------------------|------------|---------|--------|---------|-------------|--------------|------|--------|
| Perfluorobutanesulfonic acid (PFBS) | QuaF | | 0.9658 | | 144 | 135 | 7.0 | 30.0 |
| Perfluoroheptanoic acid (PFHpA) | Ave | 0.9369 | 0.9586 | | 15.4 | 15.0 | 2.3 | 30.0 |
| Perfluorohexanesulfonic acid (PFHxS) | Ave | 1.674 | 1.786 | | 48.0 | 45.0 | 6.7 | 30.0 |
| Perfluorooctanoic acid (PFOA) | Ave | 0.9258 | 0.9363 | | 30.4 | 30.0 | 1.1 | 30.0 |
| Perfluorooctanesulfonic acid (PFOS) | Ave | 0.9389 | 0.9746 | | 62.3 | 60.0 | 3.8 | 30.0 |
| Perfluorononanoic acid (PFNA) | Ave | 0.6642 | 0.6549 | | 29.6 | 30.0 | -1.4 | 30.0 |
| 13C2 PFHxA | Ave | 1.100 | 1.154 | | 10.5 | 10.0 | 4.9 | 30.0 |
| 13C2 PFDA | Ave | 0.7652 | 0.7632 | | 9.97 | 10.0 | -0.3 | 30.0 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_070.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 19-Dec-2017 22:04:42 ALS Bottle#: 5 Worklist Smp#: 21
 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\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:37 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: XAWRK018

First Level Reviewer: westendorfc Date: 20-Dec-2017 13:05:24

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.366 | 1.444 | -0.078 | 1.000 | 13857186 | 144.4 | | 17569 | |
| 298.90 > 99.00 | 1.366 | 1.444 | -0.078 | 1.000 | 10556871 | | 1.31(0.00-0.00) | 17313 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.479 | 1.573 | -0.094 | 1.000 | 1690592 | 10.5 | | 9568 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.624 | 1.725 | -0.101 | 1.000 | 8544178 | 48.0 | | 11455 | |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.624 | 1.725 | -0.101 | 1.000 | 2106476 | 15.4 | | 787 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.813 | 1.913 | -0.100 | | 1464558 | 10.0 | | 7355 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.813 | 1.914 | -0.101 | 1.000 | 4117270 | 30.4 | | 749 | |
| 413.00 > 169.00 | 1.813 | 1.914 | -0.101 | 1.000 | 2224329 | | 1.85(0.00-0.00) | 6975 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.071 | 2.071 | 0.0 | 1.000 | 6216058 | 62.3 | | 1085 | M |
| 499.00 > 99.00 | 2.071 | 2.071 | 0.0 | 1.000 | 1239289 | | 5.02(0.00-0.00) | 1308 | M |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.071 | 2.151 | -0.080 | | 3048007 | 28.7 | | 7017 | |
| 9 Perfluorononanoic acid | | | | | | | | | |
| 463.00 > 419.00 | 2.079 | 2.158 | -0.079 | 1.000 | 2878003 | 29.6 | | 881 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.253 | 2.312 | -0.059 | 1.000 | 1117744 | 9.97 | | 8608 | |

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\20171220-51953.b\2017.12.19_537A_070.d

Injection Date: 19-Dec-2017 22:04:42

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 21

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

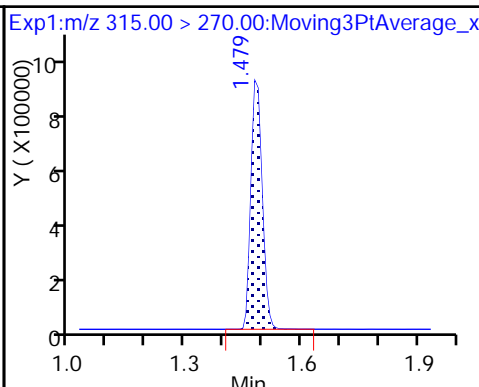
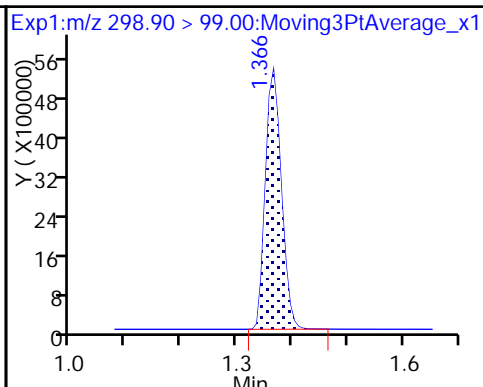
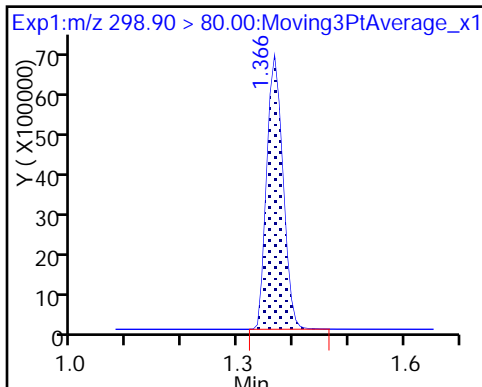
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

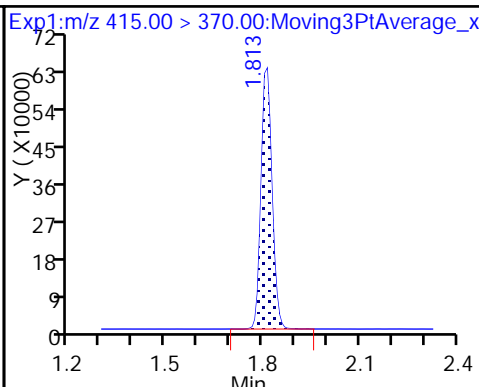
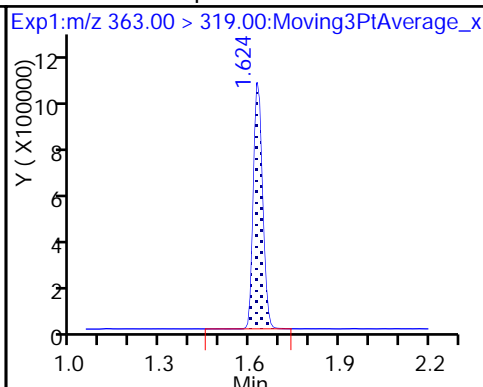
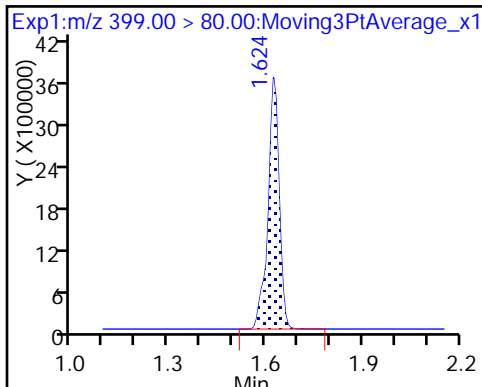
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

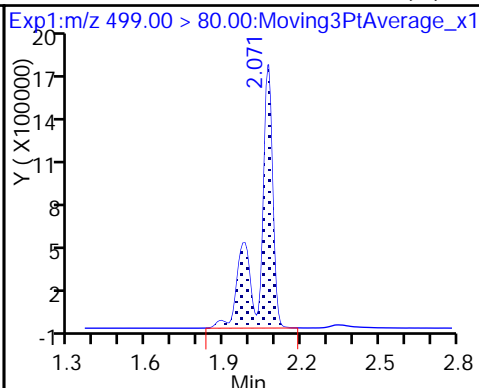
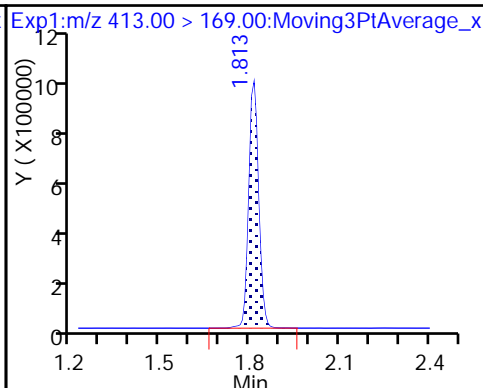
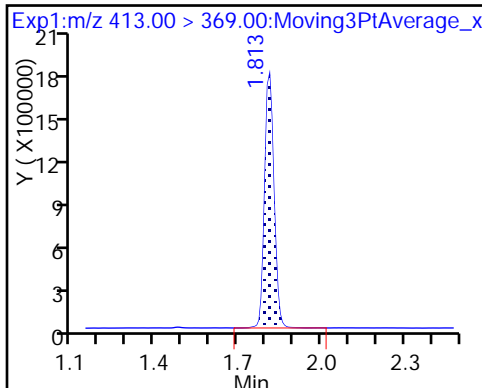
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

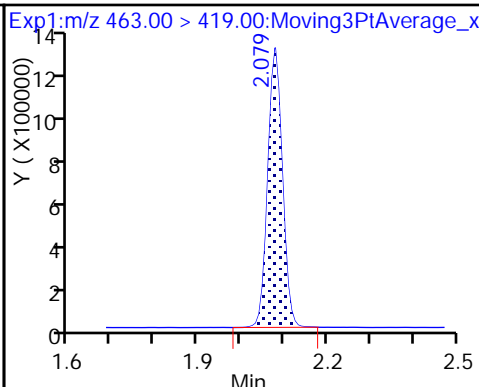
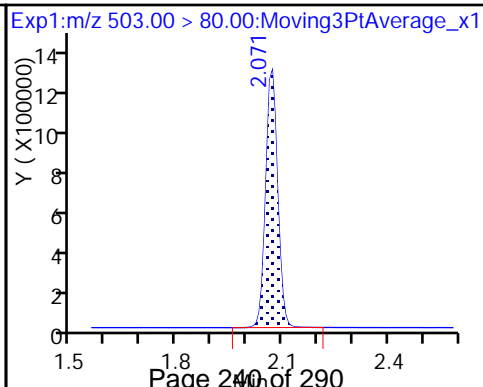
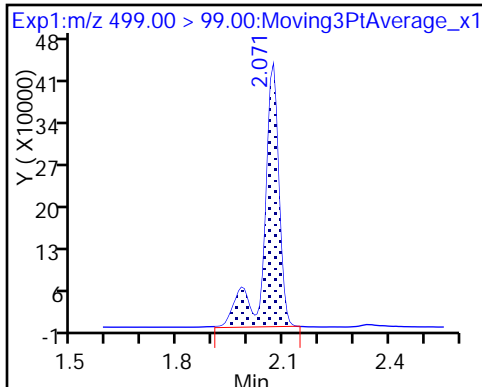
8 Perfluorooctane sulfonic acid (M)



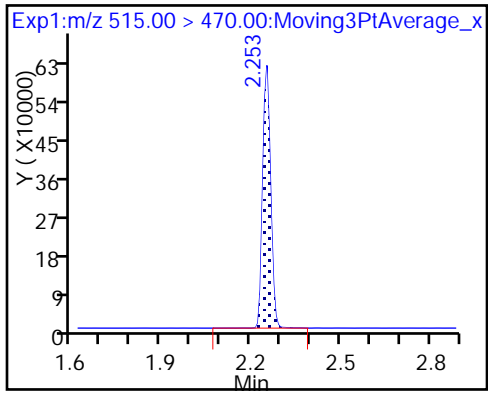
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

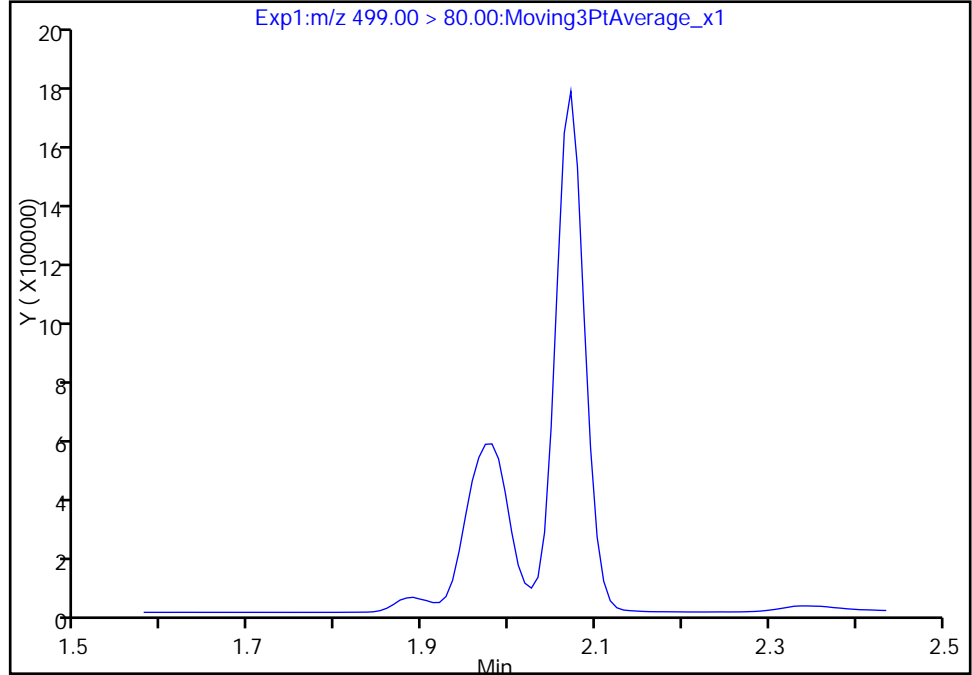
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Injection Date: 19-Dec-2017 22:04:42 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

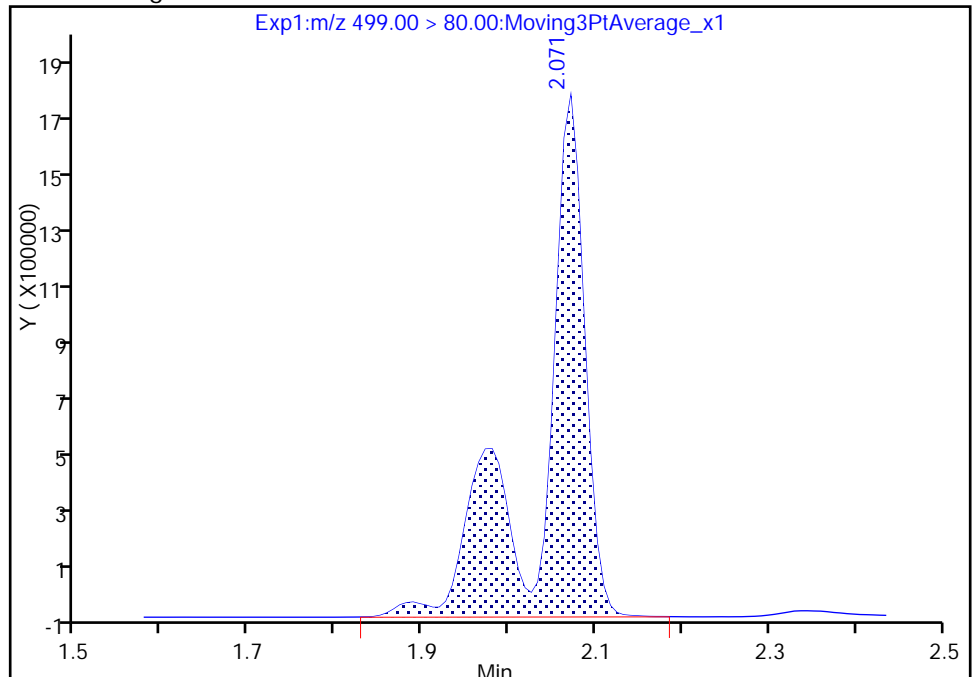
Not Detected
Expected RT: 2.07

Processing Integration Results



RT: 2.07
Area: 6216058
Amount: 62.292589
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 20-Dec-2017 14:19:27
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

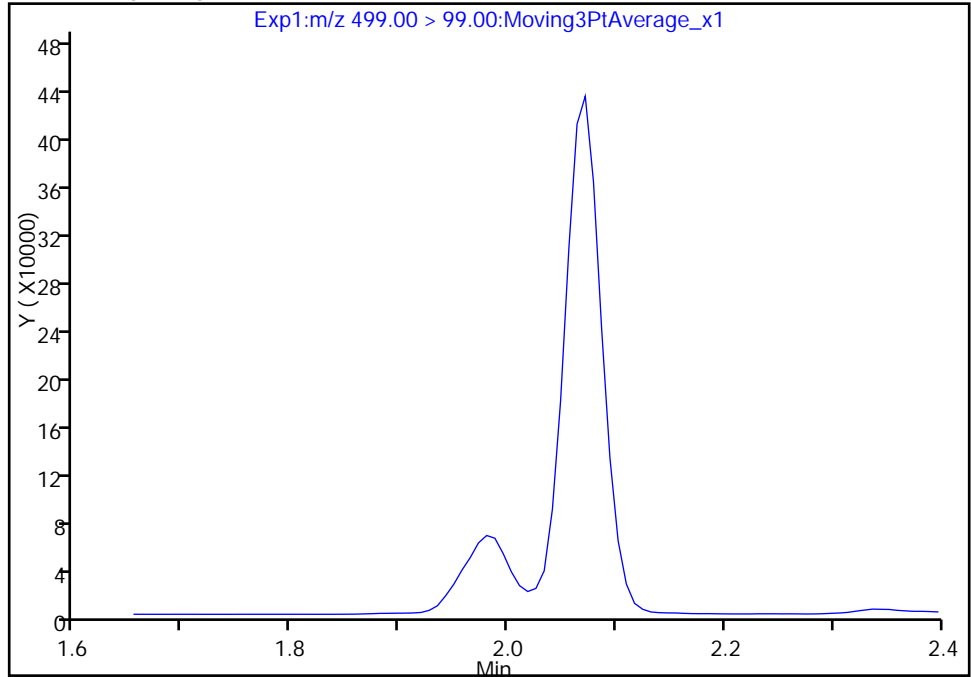
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_070.d
Injection Date: 19-Dec-2017 22:04:42 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

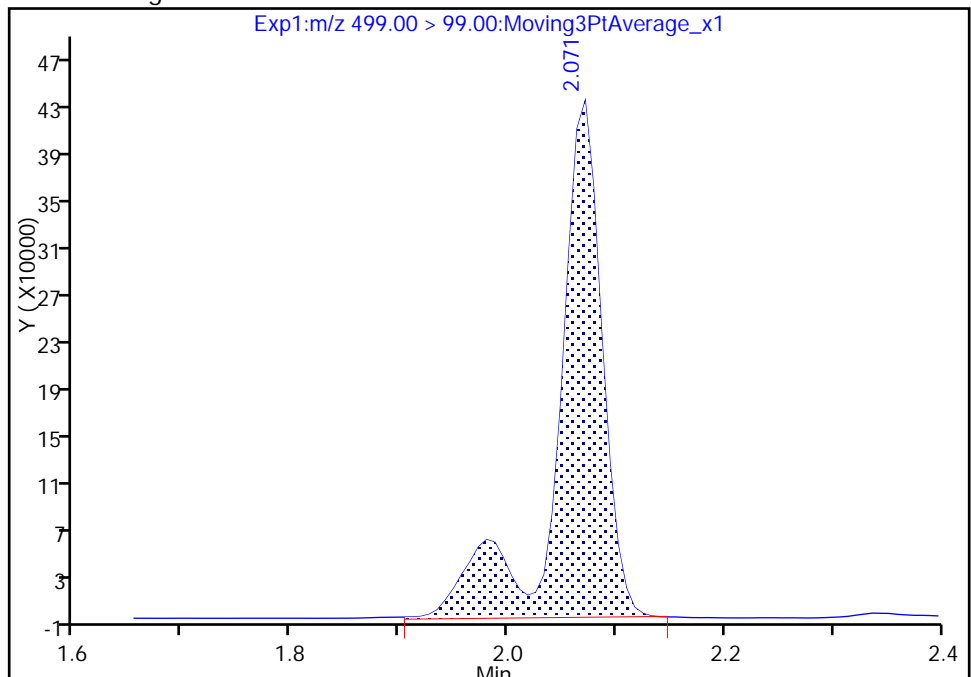
Not Detected
Expected RT: 2.07

Processing Integration Results



RT: 2.07
Area: 1239289
Amount: 62.292589
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 20-Dec-2017 14:19:49

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

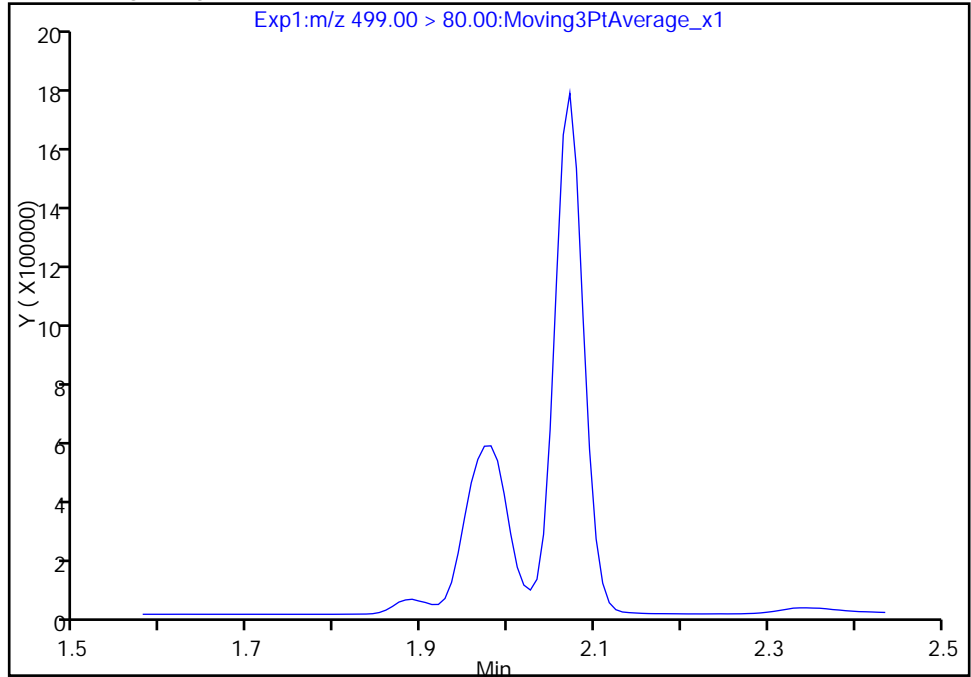
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Injection Date: 19-Dec-2017 22:04:42 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

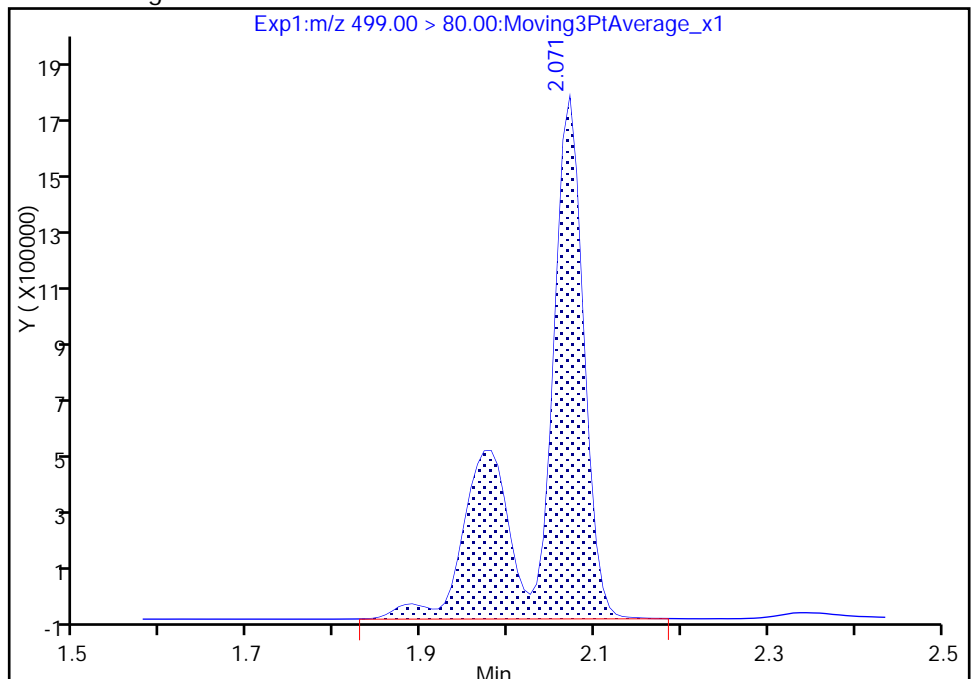
Not Detected
Expected RT: 2.07

Processing Integration Results



RT: 2.07
Area: 6216058
Amount: 62.292589
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 20-Dec-2017 14:19:49

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-199900/1-A
 Matrix: Water Lab File ID: 2017.12.19_537A_052.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 250.00 (mL) Date Analyzed: 12/19/2017 20:40
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200646 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 | 93 | | 70-130 |
| STL00996 | 13C2 PFDA | 96 | | 70-130 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_052.d
 Lims ID: MB 320-199900/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 19-Dec-2017 20:40:31 ALS Bottle#: 34 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-199900/1-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:20:18

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|-----------------|-----------------|--------|--------|--------|----------|--------------|---------------|------|-------|
| \$ 2 13C2 PFHxA | 315.00 > 270.00 | 1.487 | 1.573 | -0.086 | 1.000 | 1496305 | 9.31 | 9316 | |
| * 6 13C2-PFOA | 415.00 > 370.00 | 1.813 | 1.913 | -0.100 | | 1460001 | 10.0 | 8092 | |
| * 7 13C4 PFOS | 503.00 > 80.00 | 2.071 | 2.151 | -0.080 | | 3186036 | 28.7 | 8417 | |
| \$ 10 13C2 PFDA | 515.00 > 470.00 | 2.253 | 2.312 | -0.059 | 1.000 | 1070037 | 9.58 | 7979 | |

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_052.d

Injection Date: 19-Dec-2017 20:40:31

Instrument ID: A8_N

Lims ID: MB 320-199900/1-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 34

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

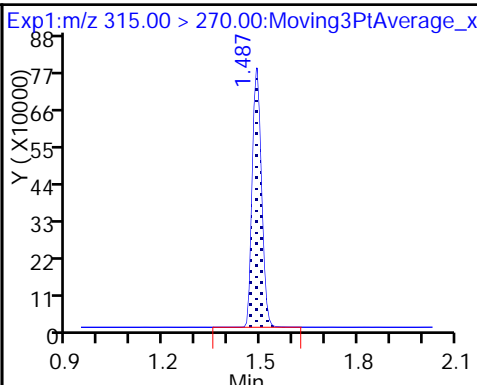
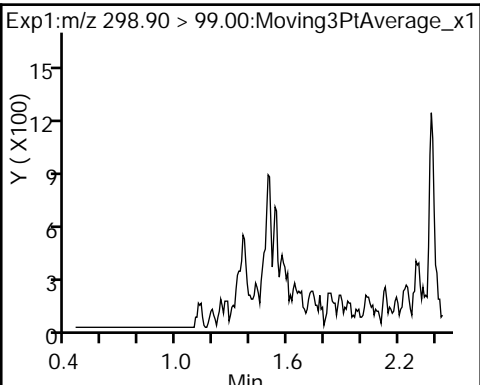
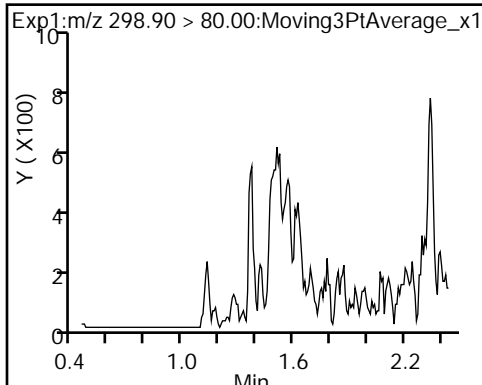
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

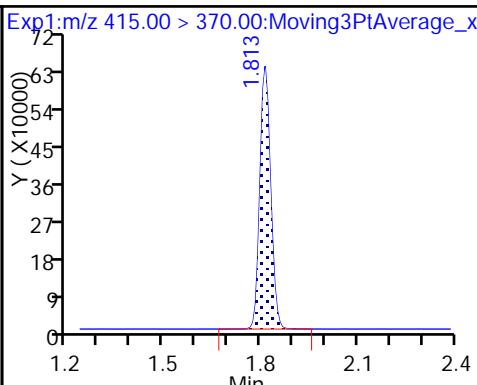
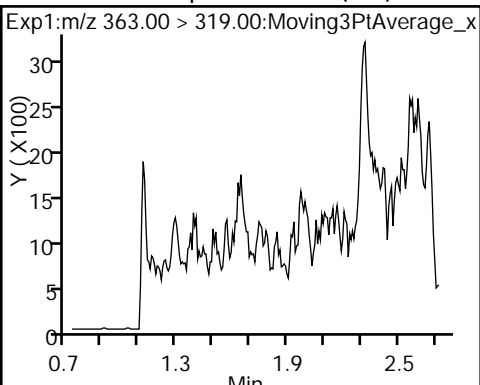
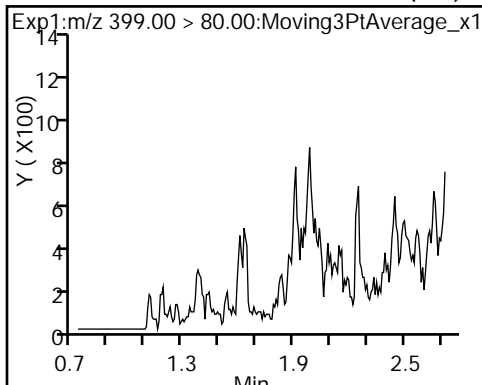
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

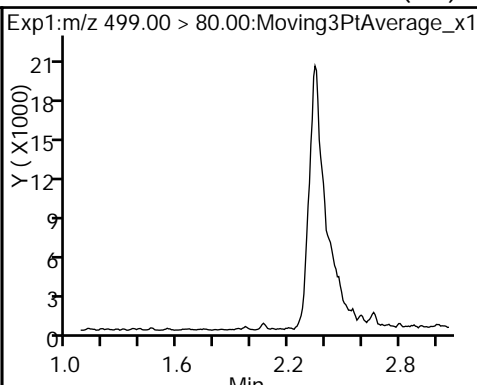
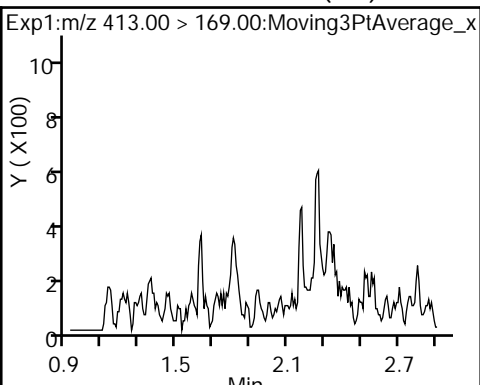
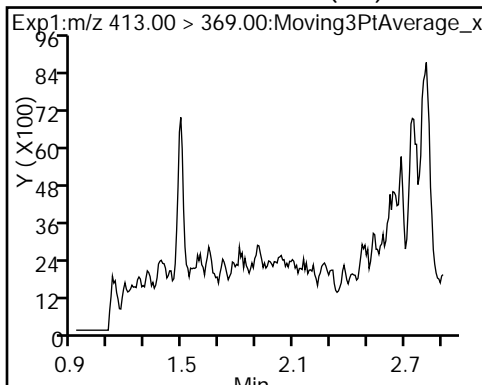
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

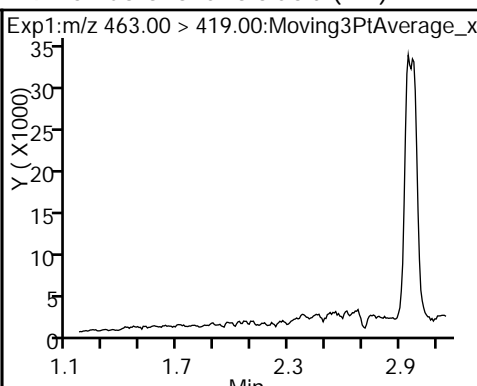
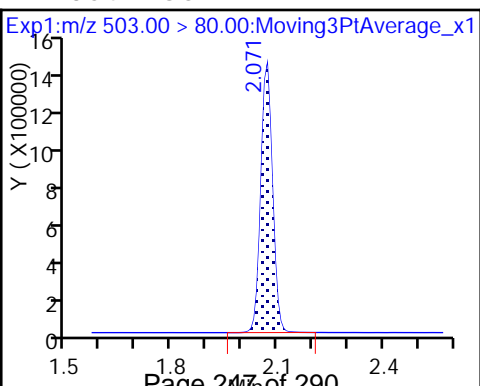
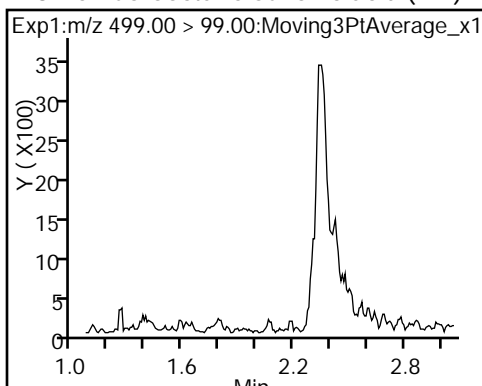
8 Perfluorooctane sulfonic acid (ND)



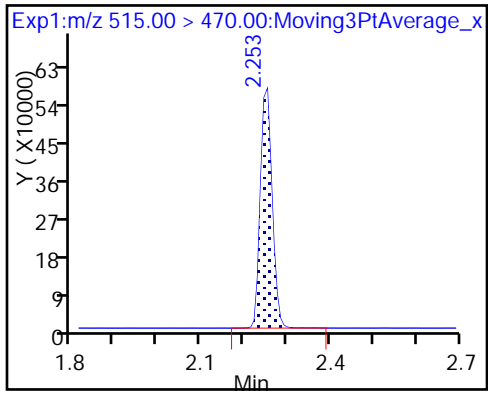
8 Perfluorooctane sulfonic acid (ND)

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_052.d
 Lims ID: MB 320-199900/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 19-Dec-2017 20:40:31 ALS Bottle#: 34 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-199900/1-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:20:18

| Compound | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0 | 9.31 | 93.15 |
| \$ 10 13C2 PFDA | 10.0 | 9.58 | 95.78 |

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 320-199900/2-A
 Matrix: Water Lab File ID: 2017.12.19_537A_053.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 250.00 (mL) Date Analyzed: 12/19/2017 20:45
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200646 Units: ng/L

| CAS NO. | COMPOUND NAME | RESULT | Q | LOQ | LOD | DL |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 223 | M | 40 | 16 | 6.8 |
| 335-67-1 | Perfluorooctanoic acid (PFOA) | 110 | | 20 | 8.0 | 2.8 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 109 | | 24 | 20 | 8.0 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 183 | | 30 | 12 | 5.5 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 62.1 | | 10 | 4.0 | 1.9 |
| 375-73-5 | Perfluorobutanesulfonic acid (PFBS) | 494 | | 90 | 36 | 16 |

| CAS NO. | SURROGATE | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 97 | | 70-130 |
| STL00996 | 13C2 PFDA | 98 | | 70-130 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_053.d
 Lims ID: LCS 320-199900/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 19-Dec-2017 20:45:11 ALS Bottle#: 35 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-199900/2-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:21:28

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.366 | 1.444 | -0.078 | 1.000 | 12284191 | 123.4 | | 17381 | |
| 298.90 > 99.00 | 1.366 | 1.444 | -0.078 | 1.000 | 9361873 | | 1.31(0.00-0.00) | 13556 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.487 | 1.573 | -0.086 | 1.000 | 1551887 | 9.68 | | 10339 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.631 | 1.725 | -0.094 | 1.000 | 8149979 | 45.7 | | 10874 | |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.631 | 1.725 | -0.094 | 1.000 | 2121512 | 15.5 | | 838 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.813 | 1.913 | -0.100 | | 1457783 | 10.0 | | 7816 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.813 | 1.914 | -0.101 | 1.000 | 3720578 | 27.6 | | 755 | |
| 413.00 > 169.00 | 1.813 | 1.914 | -0.101 | 1.000 | 2052159 | | 1.81(0.00-0.00) | 6481 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.071 | 2.071 | 0.0 | 1.000 | 5577914 | 55.8 | | 1140 | M |
| 499.00 > 99.00 | 2.071 | 2.071 | 0.0 | 1.000 | 1148873 | | 4.86(0.00-0.00) | 1270 | M |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.071 | 2.151 | -0.080 | | 3055078 | 28.7 | | 7397 | |
| 9 Perfluorononanoic acid | | | | | | | | | |
| 463.00 > 419.00 | 2.079 | 2.158 | -0.079 | 1.000 | 2626948 | 27.1 | | 505 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.253 | 2.312 | -0.059 | 1.000 | 1088438 | 9.76 | | 8599 | |

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_053.d

Injection Date: 19-Dec-2017 20:45:11

Instrument ID: A8_N

Lims ID: LCS 320-199900/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 35

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

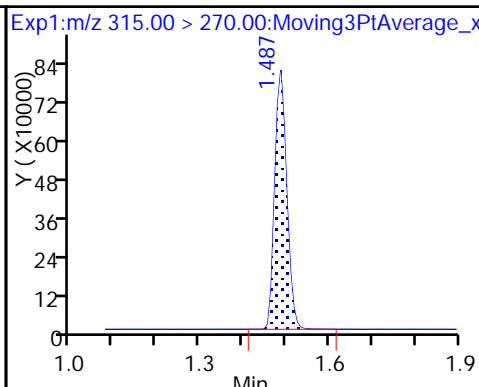
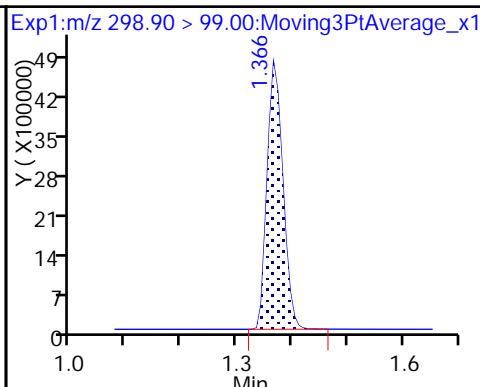
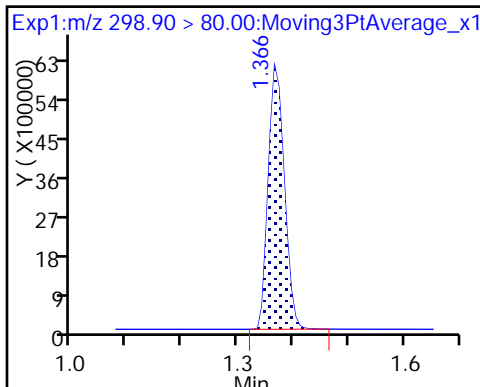
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

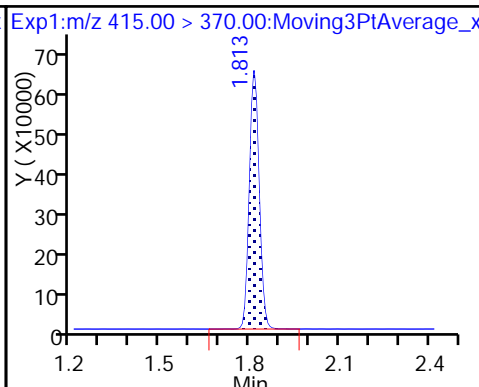
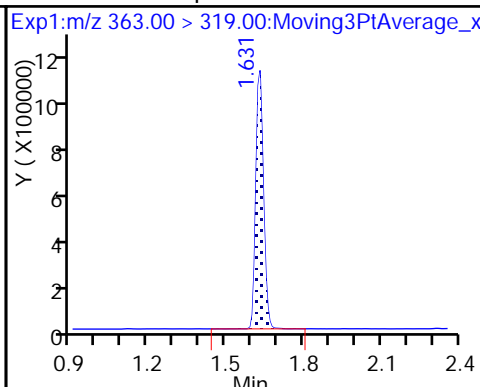
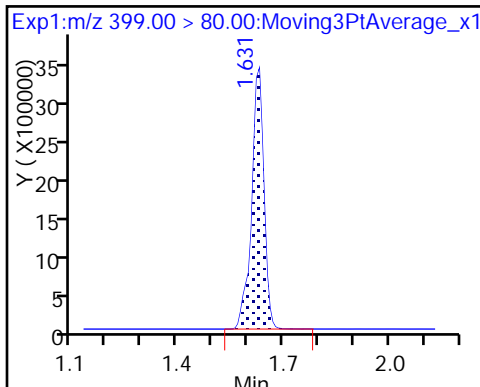
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

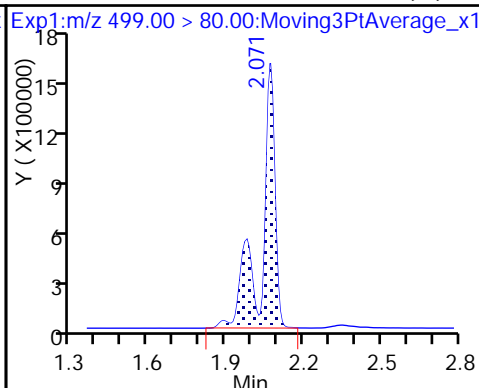
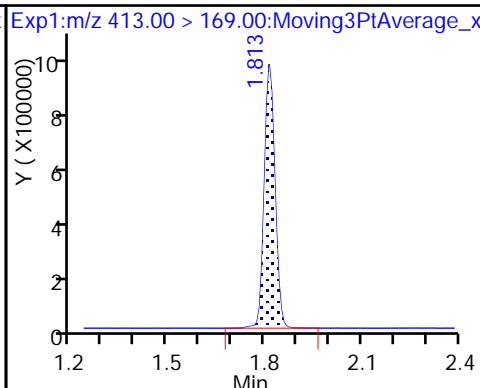
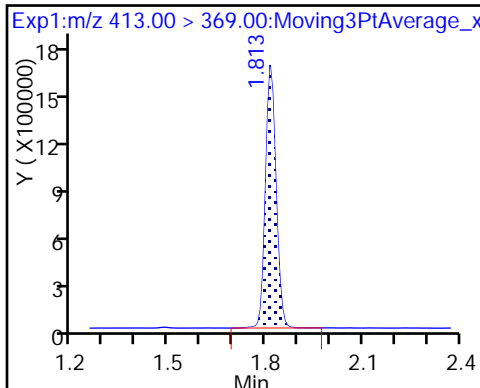
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

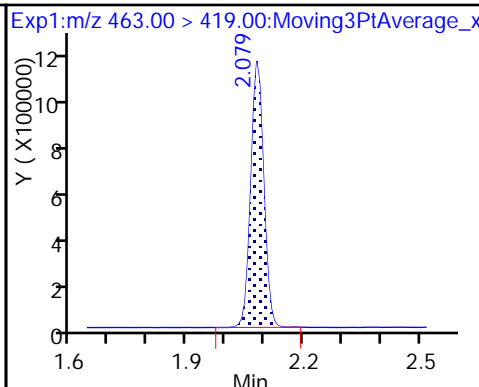
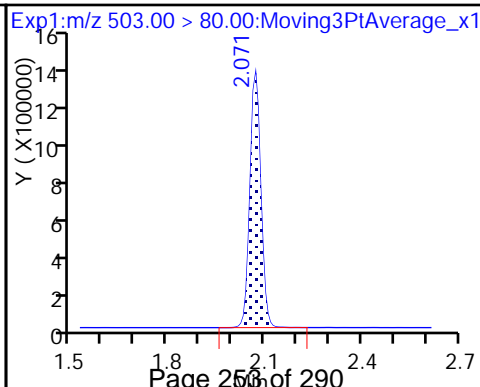
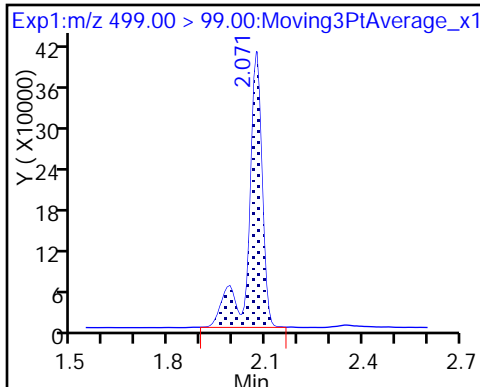
8 Perfluorooctane sulfonic acid (M)



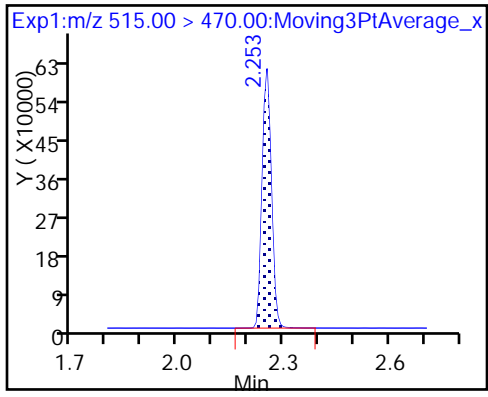
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_053.d
 Lims ID: LCS 320-199900/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 19-Dec-2017 20:45:11 ALS Bottle#: 35 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-199900/2-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:21:28

| Compound | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0 | 9.68 | 96.75 |
| \$ 10 13C2 PFDA | 10.0 | 9.76 | 97.57 |

TestAmerica Sacramento

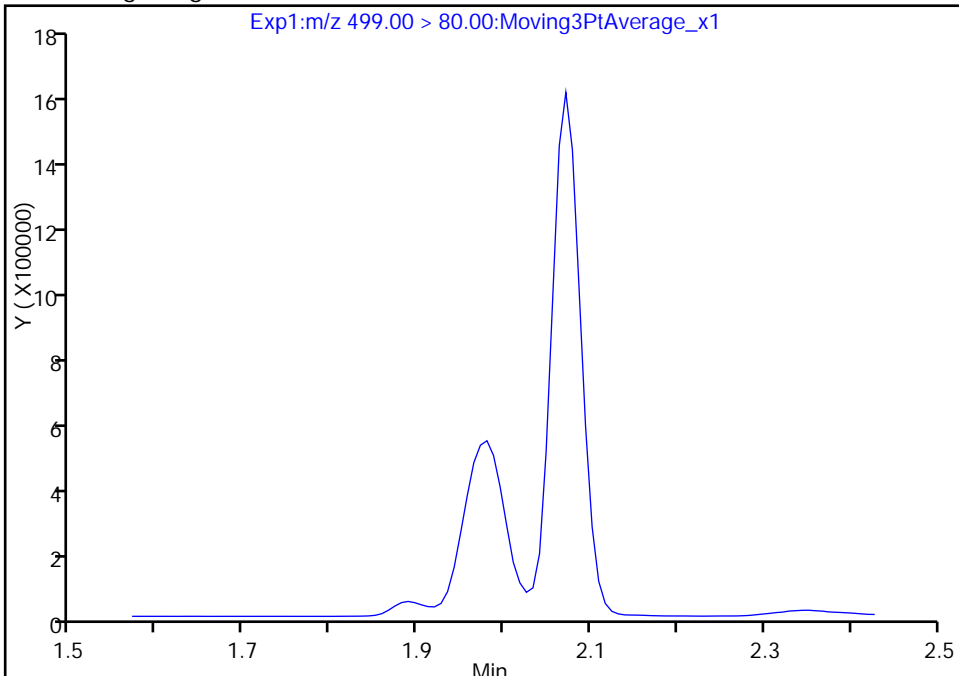
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Injection Date: 19-Dec-2017 20:45:11 Instrument ID: A8_N
Lims ID: LCS 320-199900/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 35 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

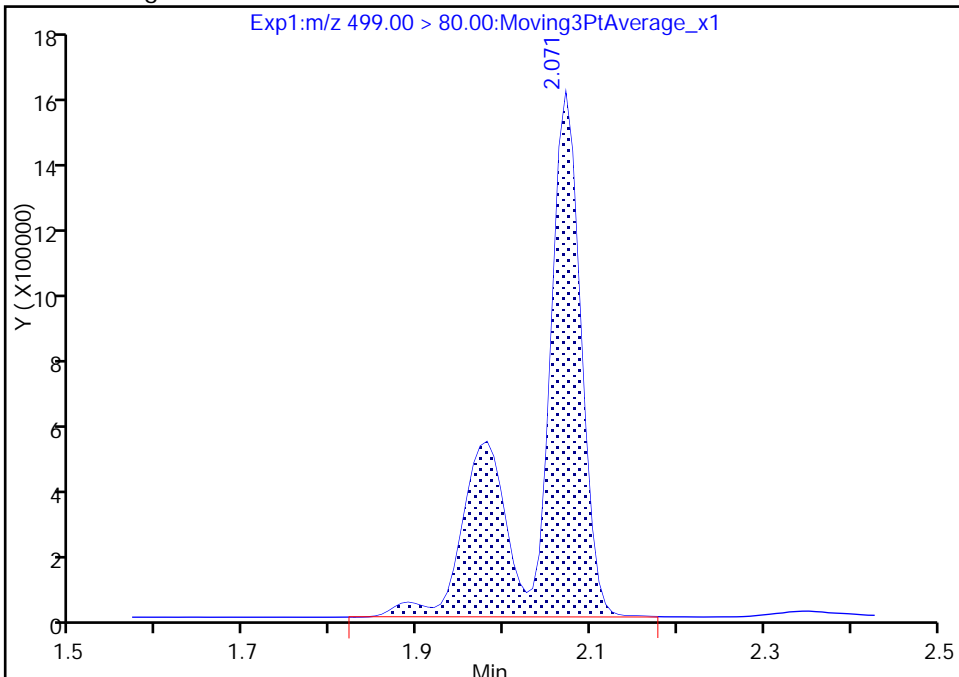
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 5577914
Amount: 55.768222
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:20:25
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

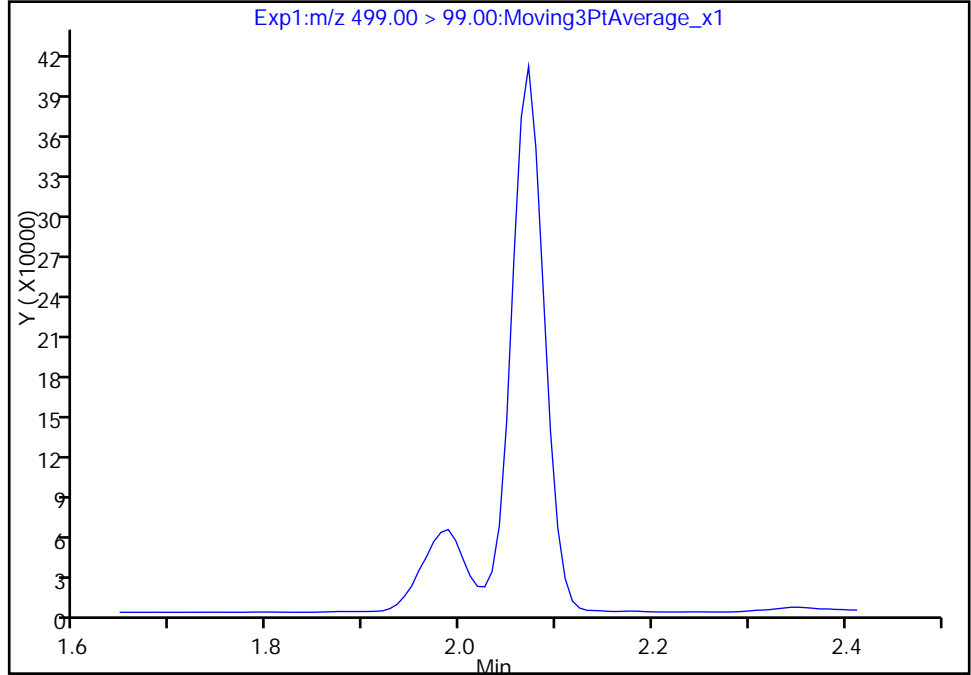
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_053.d
Injection Date: 19-Dec-2017 20:45:11 Instrument ID: A8_N
Lims ID: LCS 320-199900/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 35 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

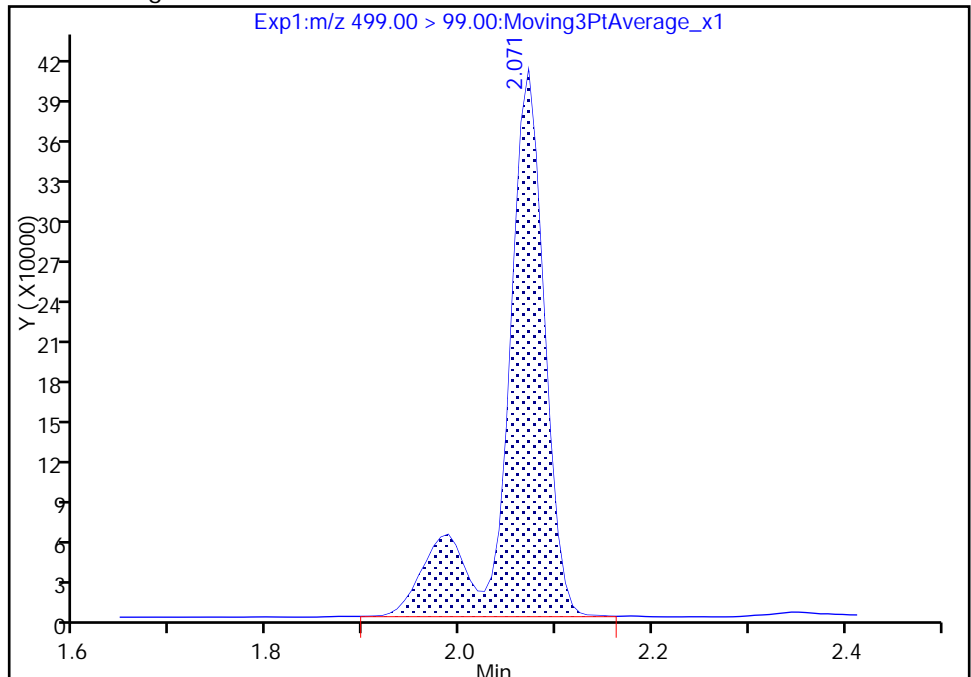
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 1148873
Amount: 55.768222
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:20:52

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

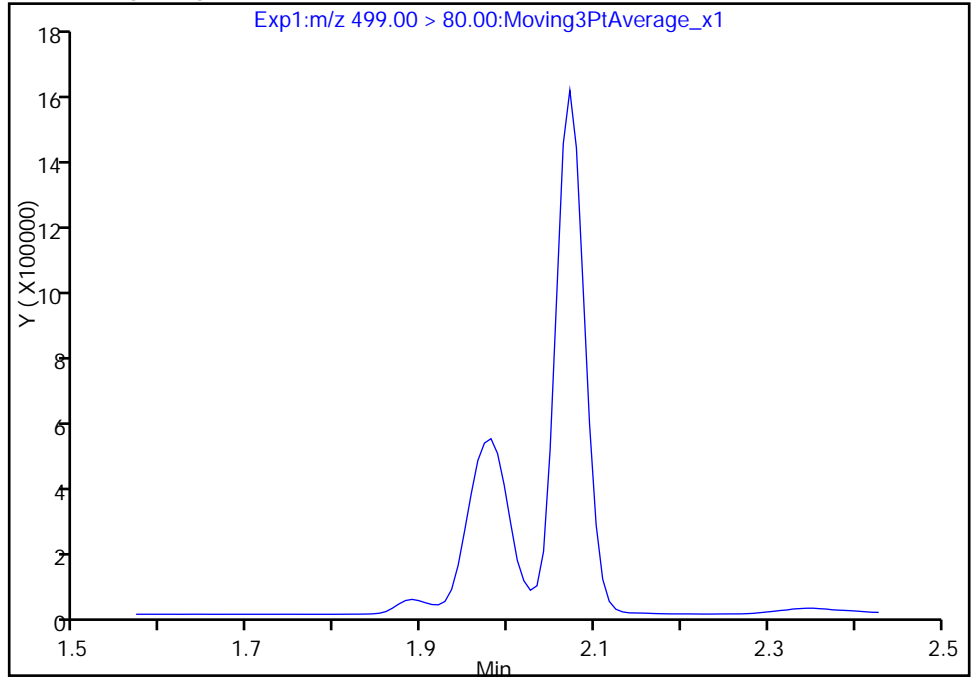
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_053.d
Injection Date: 19-Dec-2017 20:45:11 Instrument ID: A8_N
Lims ID: LCS 320-199900/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 35 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

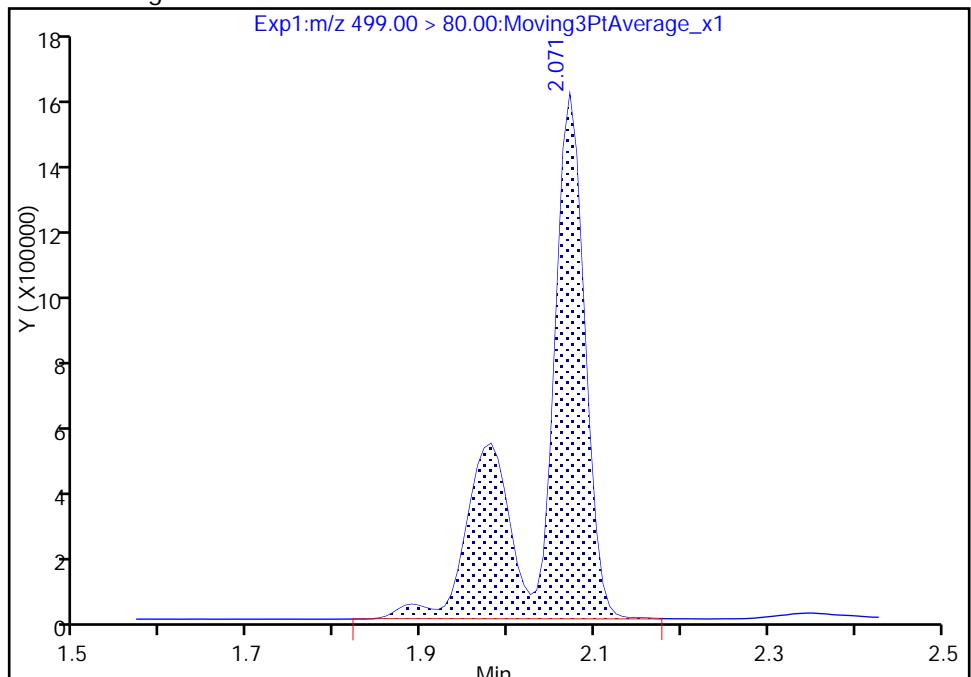
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 5577914
Amount: 55.768222
Amount Units: ng/ml



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCSD 320-199900/3-A
 Matrix: Water Lab File ID: 2017.12.19_537A_054.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 250.00 (mL) Date Analyzed: 12/19/2017 20:49
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200646 Units: ng/L

| CAS NO. | COMPOUND NAME | RESULT | Q | LOQ | LOD | DL |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 216 | M | 40 | 16 | 6.8 |
| 335-67-1 | Perfluorooctanoic acid (PFOA) | 109 | | 20 | 8.0 | 2.8 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 106 | | 24 | 20 | 8.0 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 174 | | 30 | 12 | 5.5 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 60.0 | | 10 | 4.0 | 1.9 |
| 375-73-5 | Perfluorobutanesulfonic acid (PFBS) | 480 | | 90 | 36 | 16 |

| CAS NO. | SURROGATE | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 97 | | 70-130 |
| STL00996 | 13C2 PFDA | 103 | | 70-130 |

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_054.d
 Lims ID: LCSD 320-199900/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 19-Dec-2017 20:49:52 ALS Bottle#: 36 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-199900/3-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:22:28

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | S/N | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid | | | | | | | | | |
| 298.90 > 80.00 | 1.366 | 1.444 | -0.078 | 1.000 | 12204287 | 120.1 | | 16943 | |
| 298.90 > 99.00 | 1.366 | 1.444 | -0.078 | 1.000 | 8889936 | | 1.37(0.00-0.00) | 11742 | |
| \$ 2 13C2 PFHxA | | | | | | | | | |
| 315.00 > 270.00 | 1.479 | 1.573 | -0.094 | 1.000 | 1564977 | 9.69 | | 9092 | |
| 3 Perfluorohexanesulfonic acid | | | | | | | | | |
| 399.00 > 80.00 | 1.624 | 1.725 | -0.101 | 1.000 | 7866431 | 43.4 | | 11306 | |
| 4 Perfluoroheptanoic acid | | | | | | | | | |
| 363.00 > 319.00 | 1.624 | 1.725 | -0.101 | 1.000 | 2062101 | 15.0 | | 841 | |
| * 6 13C2-PFOA | | | | | | | | | |
| 415.00 > 370.00 | 1.813 | 1.913 | -0.100 | | 1467291 | 10.0 | | 6707 | |
| 5 Perfluorooctanoic acid | | | | | | | | | |
| 413.00 > 369.00 | 1.813 | 1.914 | -0.101 | 1.000 | 3711921 | 27.3 | | 716 | |
| 413.00 > 169.00 | 1.813 | 1.914 | -0.101 | 1.000 | 2008431 | | 1.85(0.00-0.00) | 6500 | |
| 8 Perfluorooctane sulfonic acid | | | | | | | | | |
| 499.00 > 80.00 | 2.071 | 2.071 | 0.0 | 1.000 | 5472933 | 53.9 | | 1158 | M |
| 499.00 > 99.00 | 2.071 | 2.071 | 0.0 | 1.000 | 1119568 | | 4.89(0.00-0.00) | 1400 | M |
| * 7 13C4 PFOS | | | | | | | | | |
| 503.00 > 80.00 | 2.071 | 2.151 | -0.080 | | 3102295 | 28.7 | | 8601 | |
| 9 Perfluorononanoic acid | | | | | | | | | |
| 463.00 > 419.00 | 2.079 | 2.158 | -0.079 | 1.000 | 2576669 | 26.4 | | 437 | |
| \$ 10 13C2 PFDA | | | | | | | | | |
| 515.00 > 470.00 | 2.253 | 2.312 | -0.059 | 1.000 | 1154029 | 10.3 | | 8898 | |

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_054.d

Injection Date: 19-Dec-2017 20:49:52 Instrument ID: A8_N

Lims ID: LCSD 320-199900/3-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 36

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

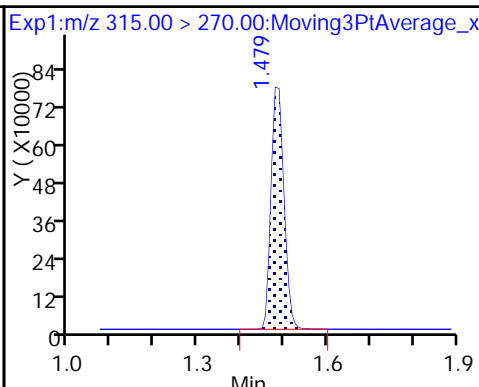
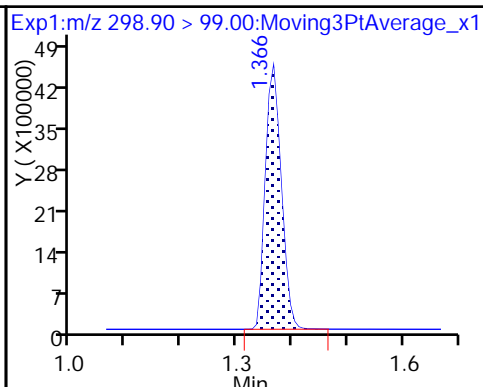
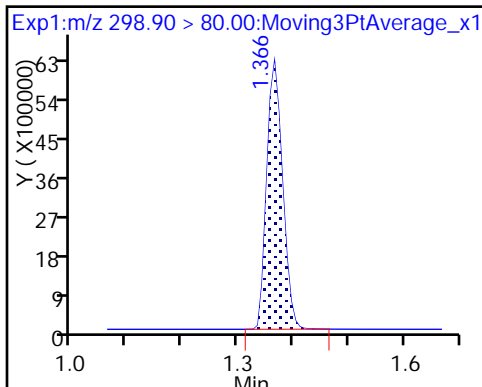
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

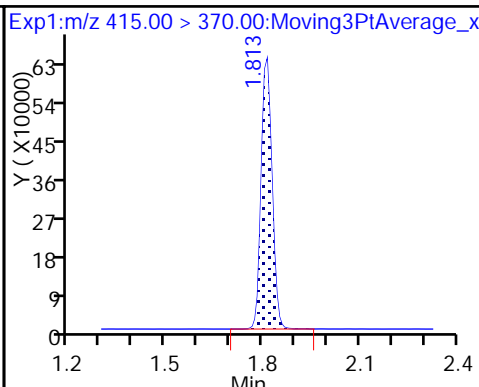
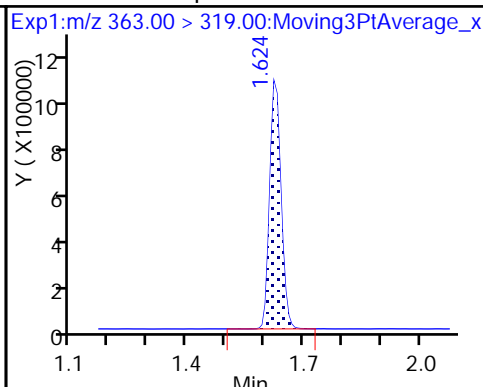
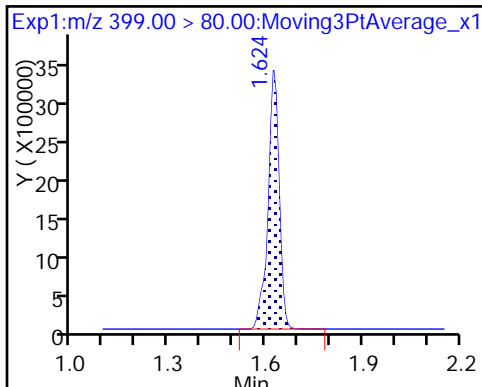
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

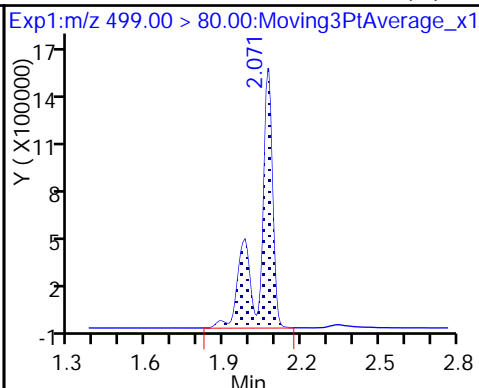
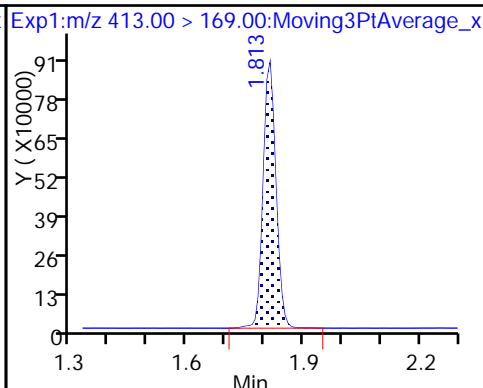
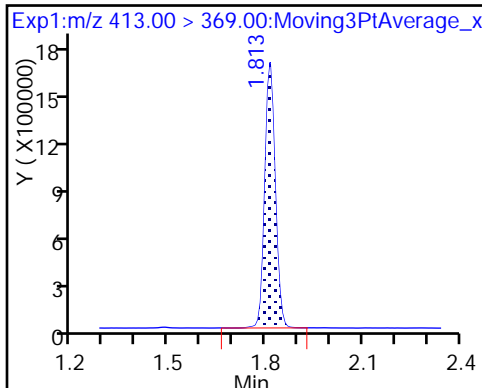
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

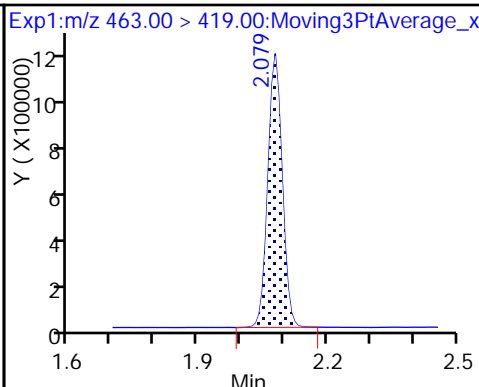
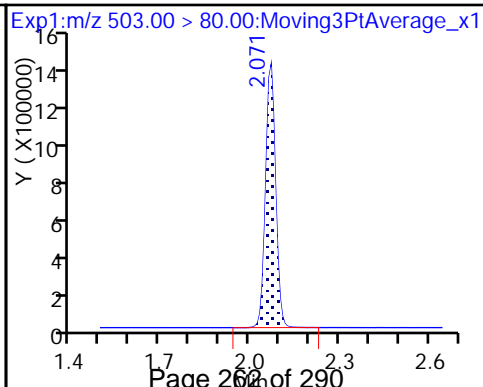
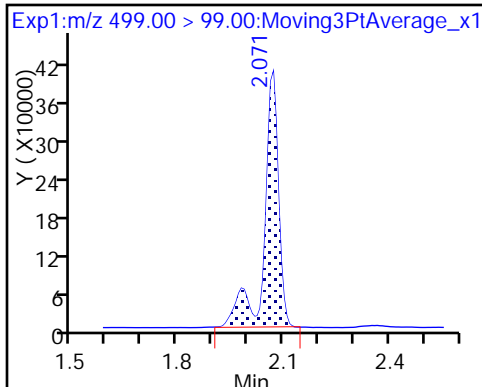
8 Perfluorooctane sulfonic acid (M)



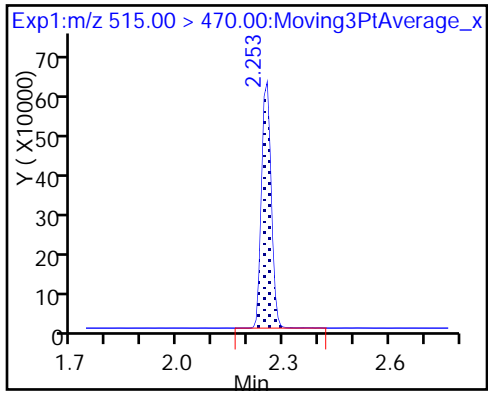
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_054.d
 Lims ID: LCSD 320-199900/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 19-Dec-2017 20:49:52 ALS Bottle#: 36 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-199900/3-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 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: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:22:28

| Compound | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0 | 9.69 | 96.94 |
| \$ 10 13C2 PFDA | 10.0 | 10.3 | 102.78 |

TestAmerica Sacramento

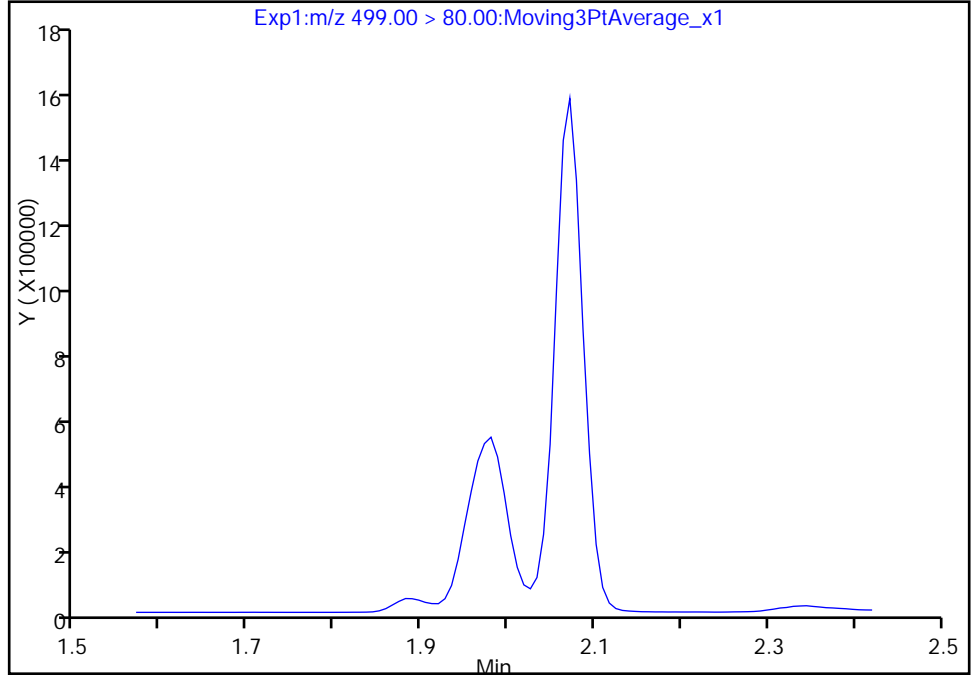
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_054.d
Injection Date: 19-Dec-2017 20:49:52 Instrument ID: A8_N
Lims ID: LCSD 320-199900/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 36 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

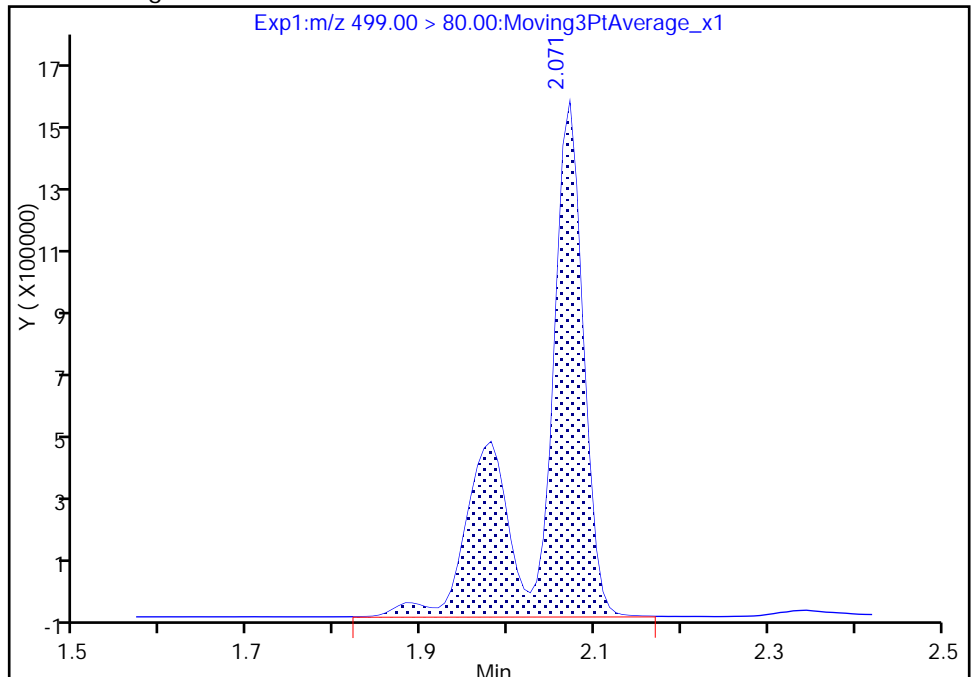
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 5472933
Amount: 53.885799
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:21:34
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

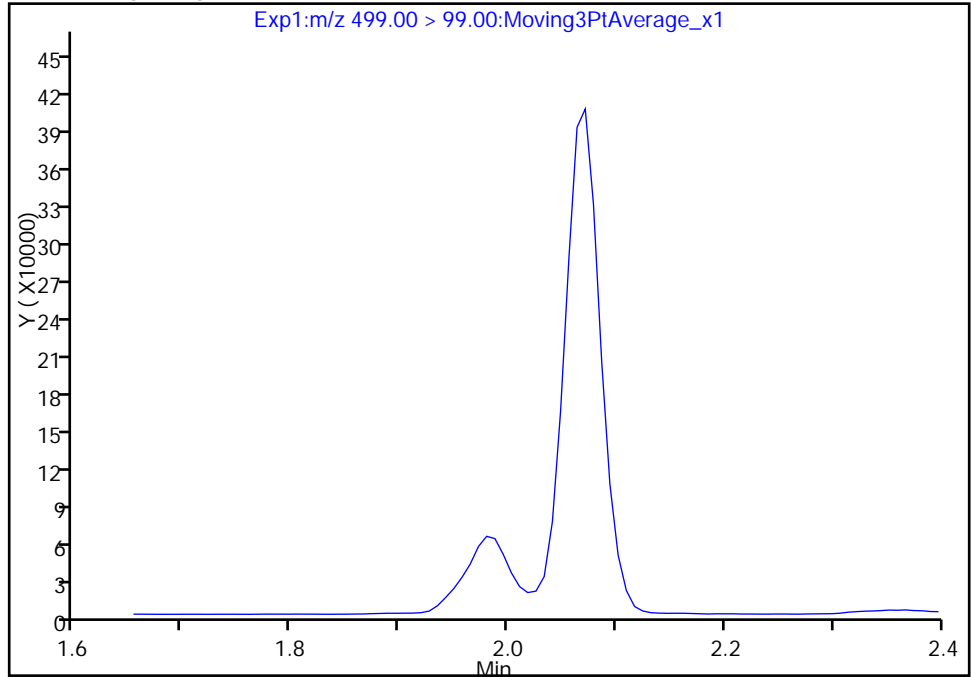
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_054.d
Injection Date: 19-Dec-2017 20:49:52 Instrument ID: A8_N
Lims ID: LCSD 320-199900/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 36 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

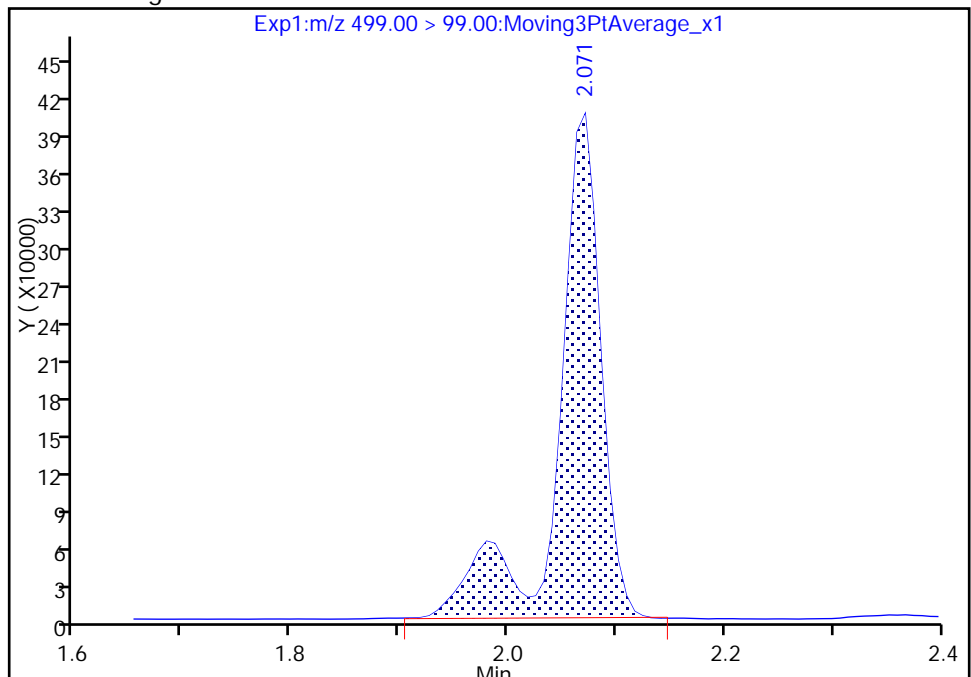
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 1119568
Amount: 53.885799
Amount Units: ng/ml



TestAmerica Sacramento

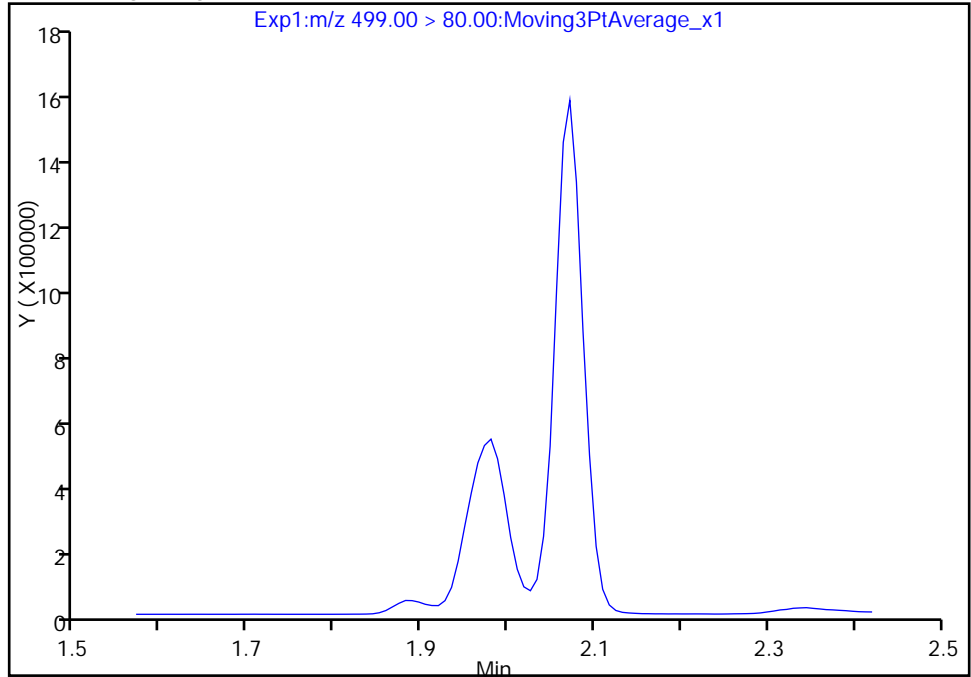
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_054.d
Injection Date: 19-Dec-2017 20:49:52 Instrument ID: A8_N
Lims ID: LCSD 320-199900/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 36 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

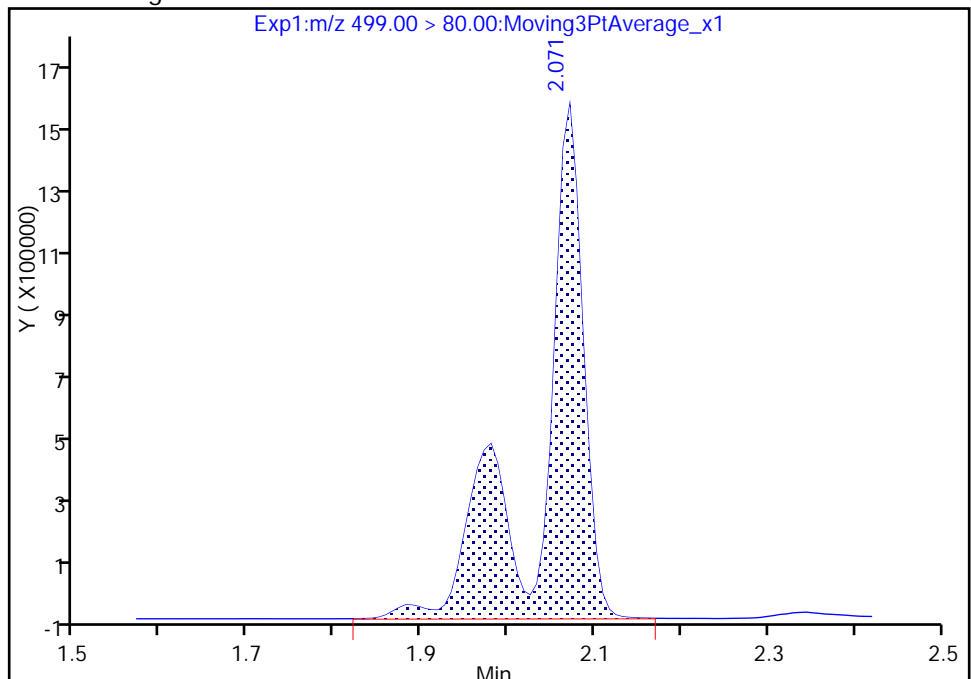
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 5472933
Amount: 53.885799
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:21:54

Audit Action: Manually Integrated

Audit Reason: Missed Peak

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1

SDG No.: _____

Instrument ID: A8_N Start Date: 11/03/2017 13:37

Analysis Batch Number: 192908 End Date: 11/03/2017 14:24

| LAB SAMPLE ID | CLIENT SAMPLE ID | DATE ANALYZED | DILUTION FACTOR | LAB FILE ID | COLUMN ID |
|---------------------------|------------------|------------------|-----------------|-------------------------------|-----------------------|
| IC 320-192908/4 | | 11/03/2017 13:37 | 1 | 2017.11.03_537X ICAL 004.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/5 | | 11/03/2017 13:42 | 1 | 2017.11.03_537X ICAL 005.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/6 | | 11/03/2017 13:47 | 1 | 2017.11.03_537X ICAL 006.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/7 ICISAV | | 11/03/2017 13:52 | 1 | 2017.11.03_537X ICAL 007.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/8 | | 11/03/2017 13:56 | 1 | 2017.11.03_537X ICAL 008.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/9 | | 11/03/2017 14:01 | 1 | 2017.11.03_537X ICAL 009.d | GeminiC18 3x100 3(mm) |
| ZZZZZ | | 11/03/2017 14:06 | 1 | | GeminiC18 3x100 3(mm) |
| CCVL 320-192908/11 | | 11/03/2017 14:10 | 1 | 2017.11.03_537X ICAL 011.d | GeminiC18 3x100 3(mm) |
| ZZZZZ | | 11/03/2017 14:15 | 1 | | GeminiC18 3x100 3(mm) |
| ICV 320-192908/13 | | 11/03/2017 14:20 | 1 | 2017.11.03_537X ICAL 013.d | GeminiC18 3x100 3(mm) |
| ZZZZZ | | 11/03/2017 14:24 | 1 | | GeminiC18 3x100 3(mm) |

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/18/2017 09:53

Analysis Batch Number: 200292 End Date: 12/18/2017 10:31

| LAB SAMPLE ID | CLIENT SAMPLE ID | DATE ANALYZED | DILUTION FACTOR | LAB FILE ID | COLUMN ID |
|---------------------------|------------------|------------------|-----------------|--------------------------|-----------------------|
| CCVL 320-200292/1 | | 12/18/2017 09:53 | 1 | 2017.12.18_537A 004.d | GeminiC18 3x100 3(mm) |
| CCV 320-200292/2 CCVIS | | 12/18/2017 09:58 | 1 | | GeminiC18 3x100 3(mm) |
| CCV 320-200292/9 CCVIS | | 12/18/2017 10:31 | 1 | | GeminiC18 3x100 3(mm) |

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/19/2017 20:31

Analysis Batch Number: 200646 End Date: 12/19/2017 21:27

| LAB SAMPLE ID | CLIENT SAMPLE ID | DATE ANALYZED | DILUTION FACTOR | LAB FILE ID | COLUMN ID |
|----------------------------|------------------|------------------|-----------------|--------------------------|-----------------------|
| CCV 320-200646/1 CCVIS | | 12/19/2017 20:31 | 1 | 2017.12.19_537A 050.d | GeminiC18 3x100 3(mm) |
| MB 320-199900/1-A | | 12/19/2017 20:40 | 1 | 2017.12.19_537A 052.d | GeminiC18 3x100 3(mm) |
| LCS 320-199900/2-A | | 12/19/2017 20:45 | 1 | 2017.12.19_537A 053.d | GeminiC18 3x100 3(mm) |
| LCSD 320-199900/3-A | | 12/19/2017 20:49 | 1 | 2017.12.19_537A 054.d | GeminiC18 3x100 3(mm) |
| 320-34181-1 | | 12/19/2017 20:54 | 1 | 2017.12.19_537A 055.d | GeminiC18 3x100 3(mm) |
| 320-34181-2 | | 12/19/2017 20:59 | 1 | 2017.12.19_537A 056.d | GeminiC18 3x100 3(mm) |
| 320-34181-3 | | 12/19/2017 21:03 | 1 | 2017.12.19_537A 057.d | GeminiC18 3x100 3(mm) |
| 320-34181-4 | | 12/19/2017 21:08 | 1 | 2017.12.19_537A 058.d | GeminiC18 3x100 3(mm) |
| 320-34181-5 | | 12/19/2017 21:13 | 1 | 2017.12.19_537A 059.d | GeminiC18 3x100 3(mm) |
| 320-34181-6 | | 12/19/2017 21:17 | 1 | 2017.12.19_537A 060.d | GeminiC18 3x100 3(mm) |
| 320-34181-7 | | 12/19/2017 21:22 | 1 | 2017.12.19_537A 061.d | GeminiC18 3x100 3(mm) |
| CCV 320-200646/13 CCVIS | | 12/19/2017 21:27 | 1 | 2017.12.19_537A 062.d | GeminiC18 3x100 3(mm) |

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/19/2017 21:27

Analysis Batch Number: 200767 End Date: 12/19/2017 22:04

| LAB SAMPLE ID | CLIENT SAMPLE ID | DATE ANALYZED | DILUTION FACTOR | LAB FILE ID | COLUMN ID |
|----------------------------|------------------|------------------|-----------------|--------------------------|-----------------------|
| CCV 320-200767/13 CCVIS | | 12/19/2017 21:27 | 1 | 2017.12.19_537A 062.d | GeminiC18 3x100 3(mm) |
| 320-34181-8 | | 12/19/2017 21:36 | 1 | 2017.12.19_537A 064.d | GeminiC18 3x100 3(mm) |
| 320-34181-9 | | 12/19/2017 21:41 | 1 | 2017.12.19_537A 065.d | GeminiC18 3x100 3(mm) |
| ZZZZZ | | 12/19/2017 21:46 | 1 | | GeminiC18 3x100 3(mm) |
| ZZZZZ | | 12/19/2017 21:50 | 1 | | GeminiC18 3x100 3(mm) |
| ZZZZZ | | 12/19/2017 21:55 | 1 | | GeminiC18 3x100 3(mm) |
| ZZZZZ | | 12/19/2017 22:00 | 1 | | GeminiC18 3x100 3(mm) |
| CCV 320-200767/21 CCVIS | | 12/19/2017 22:04 | 1 | 2017.12.19_537A 070.d | GeminiC18 3x100 3(mm) |

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1

SDG No.: _____

Batch Number: 199900 Batch Start Date: 12/14/17 12:48 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 12/18/17 15:10

| Lab Sample ID | Client Sample ID | Method Chain | Basis | GrossWeight | TareWeight | InitialAmount | FinalAmount | ReceivedpH | LC537-HSP 00023 |
|-------------------|----------------------|--------------|-------|-------------|------------|---------------|-------------|------------|-----------------|
| MB 320-199900/1 | | 537, 537 | | | | 250.00 mL | 1.00 mL | 7 SU | |
| LCS 320-199900/2 | | 537, 537 | | | | 250.00 mL | 1.00 mL | 7 SU | 100 uL |
| LCSD 320-199900/3 | | 537, 537 | | | | 250.00 mL | 1.00 mL | 7 SU | 100 uL |
| 320-34181-A-1 | WGNA-121117-RW-0488 | 537, 537 | T | 255.67 g | 27.09 g | 228.6 mL | 1.00 mL | 7 SU | |
| 320-34181-A-2 | WGNA-121117-FRB-0488 | 537, 537 | T | 280.58 g | 27.03 g | 253.6 mL | 1.00 mL | 7 SU | |
| 320-34181-A-3 | NAWC-121117-RW-136 | 537, 537 | T | 273.58 g | 27.55 g | 246 mL | 1.00 mL | 7 SU | |
| 320-34181-A-4 | NAWC-121117-FRB-136 | 537, 537 | T | 275.68 g | 26.94 g | 248.7 mL | 1.00 mL | 7 SU | |
| 320-34181-A-5 | NAWC-121117-RW-040 | 537, 537 | T | 275.87 g | 27.47 g | 248.4 mL | 1.00 mL | 7 SU | |
| 320-34181-A-6 | NAWC-121117-FRB-040 | 537, 537 | T | 274.29 g | 26.91 g | 247.4 mL | 1.00 mL | 7 SU | |
| 320-34181-A-7 | WGNA-121117-RW-4846 | 537, 537 | T | 274.34 g | 27.57 g | 246.8 mL | 1.00 mL | 7 SU | |
| 320-34181-A-8 | WGNA-121117-FRB-4846 | 537, 537 | T | 277.49 g | 27.17 g | 250.3 mL | 1.00 mL | 7 SU | |
| 320-34181-A-9 | WGNA-121117-DUP14 | 537, 537 | T | 272.99 g | 27.17 g | 245.8 mL | 1.00 mL | 7 SU | |

| Lab Sample ID | Client Sample ID | Method Chain | Basis | LC537-IS 00054 | LC537-SU 00056 | AnalysisComment | | | |
|-------------------|----------------------|--------------|-------|----------------|----------------|-----------------|--|--|--|
| MB 320-199900/1 | | 537, 537 | | 100 uL | 100 uL | C1 ND | | | |
| LCS 320-199900/2 | | 537, 537 | | 100 uL | 100 uL | C1 ND | | | |
| LCSD 320-199900/3 | | 537, 537 | | 100 uL | 100 uL | C1 ND | | | |
| 320-34181-A-1 | WGNA-121117-RW-0488 | 537, 537 | T | 100 uL | 100 uL | C1 ND | | | |
| 320-34181-A-2 | WGNA-121117-FRB-0488 | 537, 537 | T | 100 uL | 100 uL | C1 ND | | | |
| 320-34181-A-3 | NAWC-121117-RW-136 | 537, 537 | T | 100 uL | 100 uL | C1 ND | | | |
| 320-34181-A-4 | NAWC-121117-FRB-136 | 537, 537 | T | 100 uL | 100 uL | C1 ND | | | |
| 320-34181-A-5 | NAWC-121117-RW-040 | 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.: 320-34181-1

SDG No.: _____

Batch Number: 199900 Batch Start Date: 12/14/17 12:48 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 12/18/17 15:10

| Lab Sample ID | Client Sample ID | Method Chain | Basis | LC537-IS 00054 | LC537-SU 00056 | AnalysisComment | | | |
|---------------|----------------------|--------------|-------|----------------|----------------|-----------------|--|--|--|
| 320-34181-A-6 | NAWC-121117-FRB-040 | 537, 537 | T | 100 uL | 100 uL | C1 ND | | | |
| 320-34181-A-7 | WGNA-121117-RW-4846 | 537, 537 | T | 100 uL | 100 uL | C1 ND | | | |
| 320-34181-A-8 | WGNA-121117-FRB-4846 | 537, 537 | T | 100 uL | 100 uL | C1 ND | | | |
| 320-34181-A-9 | WGNA-121117-DUP14 | 537, 537 | T | 100 uL | 100 uL | C1 ND | | | |

| Batch Notes | |
|--------------------------------------|--------------------|
| Analyst ID - Aliquot Step | CCB |
| Analyst ID - Concentration | CCB/KMK |
| Analyst ID - Final Volume Step | CCB |
| Internal Standard ID# | 1099354 |
| Manifold ID | 1,3 |
| Methanol ID | 1105466 |
| pH Indicator ID | 4390-01 (Lot 2517) |
| Pipette ID | M16387D |
| Analyst ID - IS Reagent Drop | CCB |
| Analyst ID - IS Reagent Drop Witness | HJA |
| Analyst ID - SU Reagent Drop | JER |
| Analyst ID - SU Reagent Drop Witness | KMK |
| Analyst ID - TA Reagent Drop | JER |
| Analyst ID - TA Reagent Drop Witness | KMK |
| SPE Cartridge ID | 6357081-11 |
| Trizma ID | SLBR4303V |
| Reagent Water ID | 12-12-17 |

| 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: 34181,34235 Instrument ID & Date: 12-19-17 ICAL Batch: 192908
 Extraction Batch: 199900 Worklist #: 51953 TALS Batch: 200646,200767

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

1st Level Reviewer / Date: JRB 12-20-17 2nd Level Reviewer / Date: ANX. JRY 12/21/17

NCM # and Comments: _____

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 | |
| Initial Calibration | | | | |
| 1. Mass calibration, as needed, verified by full scan of PFC stock standard. All PFC ions used for quantitation are within 0.3 m/z of true mass? | ✓ | | | ✓ |
| 2. Responses increase with increasing concentration? | ✓ | | | ✓ |
| 3. Fit used (circle): <u>Average</u> Linear (1/x ²)Linear <u>Quadratic</u> (6 points minimum) | | | | |
| 4. Meets fit criteria? Intercept ≤ ½ RL RSD ≤ 30% for Average R ² ≥ 0.990 for Linear R ² ≥ 0.990 for Quadratic NOTE: "Force through Zero" must be used and weighted if needed | ✓ | | | ✓ |
| 5. If quadratic fit used the curve does not "bend over". | ✓ | | | ✓ |
| 6. Feed calibration points into the calculated curve. Are points ≤MRL within ±50% of true value? Are points >MRL within ±30% of true value? | ✓ | | | ✓ |
| 7. Any carryover from the high calibration point must be ≤ 1/3 RL | ✓ | | | ✓ |
| 8. Asymmetry check meets criteria for the first two eluting peaks?.(0.8 - 1.5). | ✓ | | | ✓ |
| 9. Is the asymmetry check scanned and linked in TALS to the calibration point? | ✓ | | | ✓ |
| 10. Is ICV (2 nd source) ± 30% of true value? | ✓ | | | ✓ |
| 11. Is ICV (2 nd source) internal standards ±50% of average area of the ICAL? | ✓ | | | ✓ |
| 12. ICAL locked in Chrom and uploaded to TALS? | ✓ | | | ✓ |
| 13. ICAL locked in TALS and scanned? | | | | ✓ |

1st Level Reviewer / Date: JRB 11-6-17

2nd Level Reviewer / Date: Murray 11/6/2017

NCM # and Comments: _____

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 18DEC2017_537C Worklist Number: 51953
 Instrument Name: A8_N Chrom Method: 537_A8_N
 Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b
 QC Batching: Enabled Limit Group Batching: Enabled

| QC Batch 1 | LC 537 ICAL Raw Batch: 200646 |
|-------------------------|----------------------------------|
| # 1 CCV L5 | # 1 CCV L5 |
| # 2 RB | # 2 RB |
| # 3 MB 320-199900/1-A | # 3 MB 320-199900/1-A |
| # 4 LCS 320-199900/2-A | # 4 LCS 320-199900/2-A |
| # 5 LCSD 320-199900/3-A | # 5 LCSD 320-199900/3-A |
| # 6 320-34181-A-1-A | # 6 320-34181-A-1-A |
| # 7 320-34181-A-2-A | # 7 320-34181-A-2-A |
| # 8 320-34181-A-3-A | # 8 320-34181-A-3-A |
| # 9 320-34181-A-4-A | # 9 320-34181-A-4-A |
| #10 320-34181-A-5-A | #10 320-34181-A-5-A |
| #11 320-34181-A-6-A | #11 320-34181-A-6-A |
| #12 320-34181-A-7-A | #12 320-34181-A-7-A |
| #13 CCV L3 | #13 CCV L3 |

| QC Batch 2 | LC 537 ICAL Raw Batch: 200767 |
|---------------------|----------------------------------|
| #13 CCV L3 | #13 CCV L3 |
| #14 RB | #14 RB |
| #15 320-34181-A-8-A | #15 320-34181-A-8-A |
| #16 320-34181-A-9-A | #16 320-34181-A-9-A |
| #17 320-34235-A-1-A | #17 320-34235-A-1-A |
| #18 320-34235-A-2-A | #18 320-34235-A-2-A |
| #19 320-34235-A-3-A | #19 320-34235-A-3-A |
| #20 320-34235-A-4-A | #20 320-34235-A-4-A |
| #21 CCV L5 | #21 CCV L5 |
| #22 RB | #22 RB |

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 18DEC2017_537C

Worklist Num: 51953

Instrument: A8_N

Method: 537_A8_N

Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b

Analysis Type: SemiVOA

Creator: Royce, Amani A

Inj Volume: 2.00

Inj Vol Units: ul

| Lab ID | Worklist ID | Sample Type | Inj Date/Time | File Name | Vial | Dil Factor | Client ID | Fract |
|---------------------|-----------------|-------------|----------------------|-----------------------|------|------------|----------------------|-------|
| CCV L5 | 320-0051953-001 | CCVIS | 19-Dec-2017 20:31:10 | 2017.12.19_537A_050.d | 5 | 1.0 | | sv |
| RB | 320-0051953-002 | RB | 19-Dec-2017 20:35:51 | 2017.12.19_537A_051.d | 8 | 1.0 | | sv |
| MB 320-199900/1-A | 320-0051953-003 | MB | 19-Dec-2017 20:40:31 | 2017.12.19_537A_052.d | 34 | 1.0 | | sv |
| LCS 320-199900/2-A | 320-0051953-004 | LCS | 19-Dec-2017 20:45:11 | 2017.12.19_537A_053.d | 35 | 1.0 | | sv |
| LCSD 320-199900/3-A | 320-0051953-005 | LCSD | 19-Dec-2017 20:49:52 | 2017.12.19_537A_054.d | 36 | 1.0 | | sv |
| 320-34181-A-1-A | 320-0051953-006 | Client | 19-Dec-2017 20:54:32 | 2017.12.19_537A_055.d | 37 | 1.0 | WGNA-121117-RW-0488 | sv |
| 320-34181-A-2-A | 320-0051953-007 | Client | 19-Dec-2017 20:59:14 | 2017.12.19_537A_056.d | 38 | 1.0 | WGNA-121117-FRB-0488 | sv |
| 320-34181-A-3-A | 320-0051953-008 | Client | 19-Dec-2017 21:03:56 | 2017.12.19_537A_057.d | 39 | 1.0 | NAWC-121117-RW-136 | sv |
| 320-34181-A-4-A | 320-0051953-009 | Client | 19-Dec-2017 21:08:36 | 2017.12.19_537A_058.d | 40 | 1.0 | NAWC-121117-FRB-136 | sv |
| 320-34181-A-5-A | 320-0051953-010 | Client | 19-Dec-2017 21:13:17 | 2017.12.19_537A_059.d | 41 | 1.0 | NAWC-121117-RW-040 | sv |
| 320-34181-A-6-A | 320-0051953-011 | Client | 19-Dec-2017 21:17:58 | 2017.12.19_537A_060.d | 42 | 1.0 | NAWC-121117-FRB-040 | sv |
| 320-34181-A-7-A | 320-0051953-012 | Client | 19-Dec-2017 21:22:37 | 2017.12.19_537A_061.d | 43 | 1.0 | WGNA-121117-RW-4846 | sv |
| CCV L3 | 320-0051953-013 | CCVIS | 19-Dec-2017 21:27:18 | 2017.12.19_537A_062.d | 3 | 1.0 | | sv |
| RB | 320-0051953-014 | RB | 19-Dec-2017 21:31:59 | 2017.12.19_537A_063.d | 8 | 1.0 | | sv |
| 320-34181-A-8-A | 320-0051953-015 | Client | 19-Dec-2017 21:36:39 | 2017.12.19_537A_064.d | 44 | 1.0 | WGNA-121117-FRB-4846 | sv |
| 320-34181-A-9-A | 320-0051953-016 | Client | 19-Dec-2017 21:41:19 | 2017.12.19_537A_065.d | 45 | 1.0 | WGNA-121117-DUP14 | sv |
| 320-34235-A-1-A | 320-0051953-017 | Client | 19-Dec-2017 21:46:00 | 2017.12.19_537A_066.d | 46 | 1.0 | NAWC-121217-RW-061 | sv |
| 320-34235-A-2-A | 320-0051953-018 | Client | 19-Dec-2017 21:50:39 | 2017.12.19_537A_067.d | 47 | 1.0 | NAWC-121217-FRB-061 | sv |
| 320-34235-A-3-A | 320-0051953-019 | Client | 19-Dec-2017 21:55:21 | 2017.12.19_537A_068.d | 48 | 1.0 | NAWC-121217-RW-054 | sv |
| 320-34235-A-4-A | 320-0051953-020 | Client | 19-Dec-2017 22:00:02 | 2017.12.19_537A_069.d | 49 | 1.0 | NAWC-121217-FRB-054 | sv |
| CCV L5 | 320-0051953-021 | CCVIS | 19-Dec-2017 22:04:42 | 2017.12.19_537A_070.d | 5 | 1.0 | | sv |
| RB | 320-0051953-022 | RB | 19-Dec-2017 22:09:21 | 2017.12.19_537A_071.d | 8 | 1.0 | | sv |

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 18DEC2017_537A

Worklist Num: 51859

Instrument: A8_N

Method: 537_A8_N

Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171218-51859.b

Analysis Type: SemiVOA

Creator: Hannigan, Alyssa B

Inj Volume: 2.00

Inj Vol Units: ul

| Lab ID | Worklist ID | Sample Type | Inj Date/Time | File Name | Vial | Dil Factor | Client ID | Fract |
|-----------------|-----------------|-------------|----------------------|-----------------------|------|------------|------------------|-------|
| CCVL | 320-0051859-001 | CCVL | 18-Dec-2017 09:53:44 | 2017.12.18_537A_004.d | 2 | 1.0 | | sv |
| CCV L3 | 320-0051859-002 | CCVIS | 18-Dec-2017 09:58:23 | 2017.12.18_537A_005.d | 3 | 1.0 | | sv |
| RB | 320-0051859-003 | RB | 18-Dec-2017 10:03:03 | 2017.12.18_537A_006.d | 8 | 1.0 | | sv |
| 320-34175-A-6-A | 320-0051859-004 | Client | 18-Dec-2017 10:07:44 | 2017.12.18_537A_007.d | 1 | 100. | GC121117-LHWA-PT | sv |
| 320-34175-A-6-A | 320-0051859-005 | Client | 18-Dec-2017 10:12:25 | 2017.12.18_537A_008.d | 2 | 1.0 | GC121117-LHWA-PT | sv |
| RB | 320-0051859-006 | RB | 18-Dec-2017 10:17:07 | 2017.12.18_537A_009.d | 8 | 1.0 | | sv |
| RB | 320-0051859-007 | RB | 18-Dec-2017 10:21:46 | 2017.12.18_537A_010.d | 8 | 1.0 | | sv |
| RB | 320-0051859-008 | RB | 18-Dec-2017 10:26:25 | 2017.12.18_537A_011.d | 8 | 1.0 | | sv |
| CCV L5 | 320-0051859-009 | CCVIS | 18-Dec-2017 10:31:04 | 2017.12.18_537A_012.d | 5 | 1.0 | | sv |
| RB | 320-0051859-010 | RB | | | | | | |

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M











Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End: 12/18/2017 3:10:00PM

19 AB 12/19/17

Extraction of Perfluorinated Alkyl Acids

| Input Sample Lab ID (Analytical Method) | SDG (Job #) | GrossWt TareWt | InitAmnt FinAmnt | Rcvd | PHs Adj1 | Adj2 | Due Date | Analytical TAT | Div Rank | Comments | Output Sample Lab ID |
|--|----------------------|-------------------|---------------------|------|-------------|------|----------|-------------------|-------------|----------|---|
| 1 MB-320-199900/1 N/A | N/A | | 250.00 mL | 7 | | | N/A | N/A | N/A | CI ND |  |
| | | | 1.00 mL | | | | | | | | |
| 2 LCS-320-199900/2 N/A | N/A | | 250.00 mL | 7 | | | N/A | N/A | N/A | CI ND |  |
| | | | 1.00 mL | | | | | | | | |
| 3 LCSD-320-199900/3 N/A | N/A | | 250.00 mL | 7 | | | N/A | N/A | N/A | CI ND |  |
| | | | 1.00 mL | | | | | | | | |
| 4 320-34181-A-1 (537_DOD5) | N/A (320-34181-1) | 255.67 g | 228.6 mL | 7 | | | 12/16/17 | 16_Days | 4 | CI ND |  |
| | | 27.09 g | 1.00 mL | | | | | | | | |
| 5 320-34181-A-2 (537_DOD5) | N/A (320-34181-1) | 280.58 g | 253.6 mL | 7 | | | 12/16/17 | 16_Days | 4 | CI ND |  |
| | | 27.03 g | 1.00 mL | | | | | | | | |
| 6 320-34181-A-3 (537_DOD5) | N/A (320-34181-1) | 273.58 g | 246 mL | 7 | | | 12/16/17 | 16_Days | 4 | CI ND |  |
| | | 27.55 g | 1.00 mL | | | | | | | | |
| 7 320-34181-A-4 (537_DOD5) | N/A (320-34181-1) | 275.68 g | 248.7 mL | 7 | | | 12/16/17 | 16_Days | 4 | CI ND |  |
| | | 26.94 g | 1.00 mL | | | | | | | | |
| 8 320-34181-A-5 (537_DOD5) | N/A (320-34181-1) | 275.87 g | 248.4 mL | 7 | | | 12/16/17 | 16_Days | 4 | CI ND |  |
| | | 27.47 g | 1.00 mL | | | | | | | | |
| 9 320-34181-A-6 (537_DOD5) | N/A (320-34181-1) | 274.29 g | 247.4 mL | 7 | | | 12/16/17 | 16_Days | 4 | CI ND |  |
| | | 26.91 g | 1.00 mL | | | | | | | | |
| 10 320-34181-A-7 (537_DOD5) | N/A (320-34181-1) | 274.34 g | 246.8 mL | 7 | | | 12/16/17 | 16_Days | 4 | CI ND |  |
| | | 27.57 g | 1.00 mL | | | | | | | | |

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)







Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End: 12/18/2017 3:10:00PM

| | | | | | | | | | | | |
|----|-----------------------------|----------------------|----------|----------|---|--|----------|---------|---|-------|---|
| 11 | 320-34181-A-8 (537_DOD5) | N/A (320-34181-1) | 277.49 g | 250.3 mL | 7 | | 12/16/17 | 16_Days | 4 | CI ND |  |
| | | | 27.17 g | 1.00 mL | | | | | | | |
| 12 | 320-34181-A-9 (537_DOD5) | N/A (320-34181-1) | 272.99 g | 245.8 mL | 7 | | 12/16/17 | 16_Days | 4 | CI ND |  |
| | | | 27.17 g | 1.00 mL | | | | | | | |
| 13 | 320-34235-A-1 (537_DOD5) | N/A (320-34235-1) | 273.57 g | 246.6 mL | 7 | | 12/17/17 | 16_Days | 4 | CI ND |  |
| | | | 27.01 g | 1.00 mL | | | | | | | |
| 14 | 320-34235-A-2 (537_DOD5) | N/A (320-34235-1) | 276.41 g | 249.5 mL | 7 | | 12/17/17 | 16_Days | 4 | CI ND |  |
| | | | 26.87 g | 1.00 mL | | | | | | | |
| 15 | 320-34235-A-3 (537_DOD5) | N/A (320-34235-1) | 274.48 g | 246.9 mL | 7 | | 12/17/17 | 16_Days | 4 | CI ND |  |
| | | | 27.57 g | 1.00 mL | | | | | | | |
| 16 | 320-34235-A-4 (537_DOD5) | N/A (320-34235-1) | 249.49 g | 222.6 mL | 7 | | 12/17/17 | 16_Days | 4 | CI ND |  |
| | | | 26.86 g | 1.00 mL | | | | | | | |

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End: 12/18/2017 3:10:00PM

Batch Notes

Manifold ID 1,3

pH Indicator ID 4390-01 (Lot 2517)

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-11

Methanol ID 1105466

Reagent Water ID 12-12-17

Internal Standard ID# 1099354

Pipette ID M16387D

Analyst ID - TA Reagent Drop JER

Analyst ID - TA Reagent Drop KMK

Witness

Analyst ID - SU Reagent Drop JER

Analyst ID - SU Reagent Drop KMK

Witness

Analyst ID - IS Reagent Drop CCB

Analyst ID - IS Reagent Drop HJA

Witness

Analyst ID - Concentration CCB/KMK

Analyst ID - Aliquot Step CCB

Analyst ID - Final Volume Step CCB

Batch Comment N/A

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End: 12/18/2017 3:10:00PM

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End:

Batch Notes

Manifold ID 1,3

pH Indicator ID 4390-01 (Lot 2517)

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-11

Methanol ID 1105466

Reagent Water ID 12-12-17

Internal Standard ID# 1099354

Pipette ID M16387D

Analyst ID - TA Reagent Drop JER

Analyst ID - TA Reagent Drop Witness KMK

Analyst ID - SU Reagent Drop JER

Analyst ID - SU Reagent Drop Witness KMK

Analyst ID - IS Reagent Drop CES

Analyst ID - IS Reagent Drop Witness HQA

Analyst ID - Concentration nights

Analyst ID - Aliquot Step CES

Analyst ID - Final Volume Step CES

Batch Comment N/A

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End:

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End:

Reagent Additions Worksheet

| Lab ID | Reagent Code | Amount Added | Final Amount | By | Witness |
|-------------------|-----------------|--------------|--------------|--------------------|--------------|
| MB 320-199900/1 | LC537-SU_00056 | 100 uL | 1.00 mL | <i>[Signature]</i> | KMK 12-14-17 |
| LCS 320-199900/2 | LC537-HSP_00023 | 100 uL | 1.00 mL | | |
| LCS 320-199900/2 | LC537-SU_00056 | 100 uL | 1.00 mL | ↓ | ↓ |
| LCSD 320-199900/3 | LC537-HSP_00023 | 100 uL | 1.00 mL | | |
| LCSD 320-199900/3 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-1 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-2 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-3 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-4 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-5 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-6 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-7 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-8 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-9 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34235-A-1 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34235-A-2 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34235-A-3 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34235-A-4 | LC537-SU_00056 | 100 uL | 1.00 mL | | |

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End:

| Other Reagents: | | |
|-----------------|--------------|-------|
| Reagent | Amount/Units | Lot#: |
| | | |
| | | |
| | | |
| | | |
| | | |

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Preparation Batch Number(s) 199900 Test 537-Prep

Earliest Holding Time 12-25-17

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

1st Level Reviewer: 

Date: 12/18/17

2nd Level Reviewer: VPM

Date: 12/19/17

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:

| | | | | | | | | | | |
|---|--|--|--------------------|---|---------------|---|------------------------------|-------------------------------|----------------------|-------------------------------|
| Client Contact | | Project Manager: Andy Frebowitz | | Site Contact: Mary Kay Bond | | Date: 12/11/2017 | | COC No: | | |
| TetraTech 234 Mall Boulevard Suite 260 King of Prussia, PA 19406 610-382-1174 610-491-9688 Project Name: WE04 Site: WE04 P O # 1132358 (through EarthToxics) | | Tel/Fax: 610.382.1170 | | Lab Contact: Dave Alltucker | | Carrier: FedEx | | 1 of 1 COCs | | |
| | | Analysis Turnaround Time | | | | | | Sampler: Mary Kay Bond | | |
| | | <input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS | | | | | | For Lab Use Only: | | |
| | | TAT if different from Below 21 | | | | | | Walk-in Client: | | |
| | | <input type="checkbox"/> 2 weeks | | | | | | Lab Sampling: | | |
| | | <input type="checkbox"/> 1 week | | | | | | | | |
| | | <input type="checkbox"/> 2 days | | | | | | Job / SDG No.: | | |
| | | <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 837 UCMR3 | Sample Specific Notes: |
| WGNA-121117-RW-0488 | | 12/11/2017 | 11:40 | G | DW | 2 | N | N | Y | |
| WGNA-121117-FRB-0488 | | 12/11/2017 | 11:35 | G | DW | 2 | N | N | Y | Field Reagent Blank |
| NAWC-121117-RW-136 | | 12/11/2017 | 12:40 | G | DW | 2 | N | N | Y | |
| NAWC-121117-FRB-136 | | 12/11/2017 | 12:35 | G | DW | 2 | N | N | Y | Field Reagent Blank |
| NAWC-121117-RW-040 | | 12/11/2017 | 13:10 | G | DW | 2 | N | N | Y | |
| NAWC-121117-FRB-040 | | 12/11/2017 | 13:05 | G | DW | 2 | N | N | Y | Field Reagent Blank |
| WGNA-121117-RW-4846 | | 12/11/2017 | 14:10 | G | DW | 2 | N | N | Y | |
| WGNA-121117-FRB-4846 | | 12/11/2017 | 14:05 | G | DW | 2 | N | N | Y | Field Reagent Blank |
| WGNA-121117-DUP14 | | 12/11/2017 | 07:00 | G | DW | 2 | N | N | Y | Duplicate |
|  320-34181 Chain of Custody | | | | | | | | | | |
| Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other: Trizma | | | | | | | | | | |
| Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the | | | | | | Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) | | | | |
| <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown | | | | | | <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months | | | | |
| Fed Ex Tracking: 7709 5314 7314 | | | | | | | | | | |
| Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No | | Custody Seal No.: | | Cooler Temp. (°C): Obs'd: <u>2.1</u> Corr'd: <u>—</u> | | Therm ID No.: <u>AK-3</u> | | | | |
| Relinquished by:  | | Company: Tetra Tech | | Date/Time: 12/11/2017 16:00 | | Received by:  | | Company: Taus | | Date/Time: 12/12/17 955 |
| Relinquished by: | | Company: | | Date/Time: | | Received by: | | Company: | | Date/Time: |
| Relinquished by: | | Company: | | Date/Time: | | Received in Laboratory by: | | Company: | | Date/Time: |

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Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-34181-1

Login Number: 34181
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

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

"WGNA-121117-RW-0488","537","RES","320-34181-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","17","ng/L","U","7.4","DL","","TRG","","","44","LOQ","YES","-99","","228.6","1.00","17","","
"WGNA-121117-RW-0488","537","RES","320-34181-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","11","ng/L","J","3.1","DL","","TRG","","","22","LOQ","YES","-99","","228.6","1.00","8.7","","
"WGNA-121117-RW-0488","537","RES","320-34181-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","7.3","ng/L","J","6.0","DL","","TRG","","","33","LOQ","YES","-99","","228.6","1.00","13","","
"WGNA-121117-RW-0488","537","RES","320-34181-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","39","ng/L","U","18","DL","","TRG","","","98","LOQ","YES","-99","","228.6","1.00","39","","
"WGNA-121117-RW-0488","537","RES","320-34181-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","5.3","ng/L","J","2.1","DL","","TRG","","","11","LOQ","YES","-99","","228.6","1.00","4.4","","
"WGNA-121117-RW-0488","537","RES","320-34181-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","22","ng/L","U","8.7","DL","","TRG","","","26","LOQ","YES","-99","","228.6","1.00","22","","
"WGNA-121117-RW-0488","537","RES","320-34181-1","TALSAC","STL00993","13C2
PFHxA","43","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","43.7","","228.6","1.00","0","","
"WGNA-121117-RW-0488","537","RES","320-34181-1","TALSAC","STL00996","13C2
PFDA","44","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","43.7","","228.6","1.00","0","","
"WGNA-121117-FRB-0488","537","RES","320-34181-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.7","DL","","TRG","","","39","LOQ","YES","-99","","253.6","1.00","16","","
"WGNA-121117-FRB-0488","537","RES","320-34181-2","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.9","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","253.6","1.00","7.9","","
"WGNA-121117-FRB-0488","537","RES","320-34181-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.4","DL","","TRG","","","30","LOQ","YES","-99","","253.6","1.00","12","","
"WGNA-121117-FRB-0488","537","RES","320-34181-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U","16","DL","","TRG","","","89","LOQ","YES","-99","","253.6","1.00","35","","
"WGNA-121117-FRB-0488","537","RES","320-34181-2","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.9","ng/L","U","1.9","DL","","TRG","","","9.9","LOQ","YES","-99","","253.6","1.00","3.9","","
"WGNA-121117-FRB-0488","537","RES","320-34181-2","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","7.9","DL","","TRG","","","24","LOQ","YES","-99","","253.6","1.00","20","","
"WGNA-121117-FRB-0488","537","RES","320-34181-2","TALSAC","STL00993","13C2
PFHxA","36","ng/L","","-99","DL","","SURR","92","","-99","LOQ","YES","39.4","","253.6","1.00","0","","
"WGNA-121117-FRB-0488","537","RES","320-34181-2","TALSAC","STL00996","13C2
PFDA","35","ng/L","","-99","DL","","SURR","89","","-99","LOQ","YES","39.4","","253.6","1.00","0","","
"NAWC-121117-RW-136","537","RES","320-34181-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","8.6","ng/L","J","6.9","DL","","TRG","","","41","LOQ","YES","-99","","246","1.00","16","","
"NAWC-121117-RW-136","537","RES","320-34181-3","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","12","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","246","1.00","8.1","","
"NAWC-121117-RW-136","537","RES","320-34181-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U M","5.6","DL","","TRG","","","30","LOQ","YES","-99","","246","1.00","12","","
"NAWC-121117-RW-136","537","RES","320-34181-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","37","ng/L","U","16","DL","","TRG","","","91","LOQ","YES","-99","","246","1.00","37","","
"NAWC-121117-RW-136","537","RES","320-34181-3","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.5","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","246","1.00","4.1","","
"NAWC-121117-RW-136","537","RES","320-34181-3","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U M","8.1","DL","","TRG","","","24","LOQ","YES","-99","","246","1.00","20","","
"NAWC-121117-RW-136","537","RES","320-34181-3","TALSAC","STL00993","13C2
PFHxA","35","ng/L","","-99","DL","","SURR","85","","-99","LOQ","YES","40.7","","246","1.00","0","","
"NAWC-121117-RW-136","537","RES","320-34181-3","TALSAC","STL00996","13C2
PFDA","35","ng/L","","-99","DL","","SURR","87","","-99","LOQ","YES","40.7","","246","1.00","0","","
"NAWC-121117-FRB-136","537","RES","320-34181-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","248.7","1.00","16","","
"NAWC-121117-FRB-136","537","RES","320-34181-4","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","248.7","1.00","8.0","","
"NAWC-121117-FRB-136","537","RES","320-34181-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS),"12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES",-99,"","248.7","1.00","12",""
"NAWC-121117-FRB-136","537","RES","320-34181-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES",-99,"","248.7","1.00","36",""
"NAWC-121117-FRB-136","537","RES","320-34181-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES",-99,"","248.7","1.00","4.0",""
"NAWC-121117-FRB-136","537","RES","320-34181-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES",-99,"","248.7","1.00","20",""
"NAWC-121117-FRB-136","537","RES","320-34181-4","TALSAC","STL00993","13C2
PFHxA","40","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","40.2","","248.7","1.00","0",""
"NAWC-121117-FRB-136","537","RES","320-34181-4","TALSAC","STL00996","13C2
PFDA","38","ng/L","","-99","DL","","SURR","95","","-99","LOQ","YES","40.2","","248.7","1.00","0",""
"NAWC-121117-RW-040","537","RES","320-34181-5","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","18","ng/L","J M","6.8","DL","","TRG","","","40","LOQ","YES",-99,"","248.4","1.00","16",""
"NAWC-121117-RW-040","537","RES","320-34181-5","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","18","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES",-99,"","248.4","1.00","8.1",""
"NAWC-121117-RW-040","537","RES","320-34181-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","7.3","ng/L","J","5.5","DL","","TRG","","","30","LOQ","YES",-99,"","248.4","1.00","12",""
"NAWC-121117-RW-040","537","RES","320-34181-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","91","LOQ","YES",-99,"","248.4","1.00","36",""
"NAWC-121117-RW-040","537","RES","320-34181-5","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","5.2","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES",-99,"","248.4","1.00","4.0",""
"NAWC-121117-RW-040","537","RES","320-34181-5","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.1","DL","","TRG","","","24","LOQ","YES",-99,"","248.4","1.00","20",""
"NAWC-121117-RW-040","537","RES","320-34181-5","TALSAC","STL00993","13C2
PFHxA","36","ng/L","","-99","DL","","SURR","90","","-99","LOQ","YES","40.3","","248.4","1.00","0",""
"NAWC-121117-RW-040","537","RES","320-34181-5","TALSAC","STL00996","13C2
PFDA","39","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","40.3","","248.4","1.00","0",""
"NAWC-121117-FRB-040","537","RES","320-34181-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.9","DL","","TRG","","","40","LOQ","YES",-99,"","247.4","1.00","16",""
"NAWC-121117-FRB-040","537","RES","320-34181-6","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",""
"NAWC-121117-FRB-040","537","RES","320-34181-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.6","DL","","TRG","","","30","LOQ","YES",-99,"","247.4","1.00","12",""
"NAWC-121117-FRB-040","537","RES","320-34181-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","91","LOQ","YES",-99,"","247.4","1.00","36",""
"NAWC-121117-FRB-040","537","RES","320-34181-6","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",""
"NAWC-121117-FRB-040","537","RES","320-34181-6","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.1","DL","","TRG","","","24","LOQ","YES",-99,"","247.4","1.00","20",""
"NAWC-121117-FRB-040","537","RES","320-34181-6","TALSAC","STL00993","13C2
PFHxA","37","ng/L","","-99","DL","","SURR","92","","-99","LOQ","YES","40.4","","247.4","1.00","0",""
"NAWC-121117-FRB-040","537","RES","320-34181-6","TALSAC","STL00996","13C2
PFDA","40","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","40.4","","247.4","1.00","0",""
"WGNA-121117-RW-4846","537","RES","320-34181-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U M","6.9","DL","","TRG","","","41","LOQ","YES",-99,"","246.8","1.00","16",""
"WGNA-121117-RW-4846","537","RES","320-34181-7","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","5.3","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES",-99,"","246.8","1.00","8.1",""
"WGNA-121117-RW-4846","537","RES","320-34181-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U M","5.6","DL","","TRG","","","30","LOQ","YES",-99,"","246.8","1.00","12",""
"WGNA-121117-RW-4846","537","RES","320-34181-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U M","16","DL","","TRG","","","91","LOQ","YES",-99,"","246.8","1.00","36",""
"WGNA-121117-RW-4846","537","RES","320-34181-7","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.1","ng/L","U M","1.9","DL","","TRG","","","10","LOQ","YES",-99,"","246.8","1.00","4.1",""
"WGNA-121117-RW-4846","537","RES","320-34181-7","TALSAC","375-95-1","Perfluorononanoic acid

(PFNA),"20","ng/L","U","8.1","DL","","TRG","","","24","LOQ","YES",-99","","246.8","1.00","20","","
"WGNA-121117-RW-4846","537","RES","320-34181-7","TALSAC","STL00993","13C2
PFHxA","36","ng/L","","-99","DL","","SURR","88","","-99","LOQ","YES","40.5","","246.8","1.00","0","","
"WGNA-121117-RW-4846","537","RES","320-34181-7","TALSAC","STL00996","13C2
PFDA","35","ng/L","","-99","DL","","SURR","87","","-99","LOQ","YES","40.5","","246.8","1.00","0","","
"WGNA-121117-FRB-4846","537","RES","320-34181-8","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES",-99","","250.3","1.00","16","","
"WGNA-121117-FRB-4846","537","RES","320-34181-8","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES",-99","","250.3","1.00","8.0","","
"WGNA-121117-FRB-4846","537","RES","320-34181-8","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES",-99","","250.3","1.00","12","","
"WGNA-121117-FRB-4846","537","RES","320-34181-8","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES",-99","","250.3","1.00","36","","
"WGNA-121117-FRB-4846","537","RES","320-34181-8","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES",-99","","250.3","1.00","4.0","","
"WGNA-121117-FRB-4846","537","RES","320-34181-8","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES",-99","","250.3","1.00","20","","
"WGNA-121117-FRB-4846","537","RES","320-34181-8","TALSAC","STL00993","13C2
PFHxA","37","ng/L","","-99","DL","","SURR","91","","-99","LOQ","YES","40.0","","250.3","1.00","0","","
"WGNA-121117-FRB-4846","537","RES","320-34181-8","TALSAC","STL00996","13C2
PFDA","39","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","40.0","","250.3","1.00","0","","
"WGNA-121117-DUP14","537","RES","320-34181-9","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.9","DL","","TRG","","","41","LOQ","YES",-99","","245.8","1.00","16","","
"WGNA-121117-DUP14","537","RES","320-34181-9","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","12","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES",-99","","245.8","1.00","8.1","","
"WGNA-121117-DUP14","537","RES","320-34181-9","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","7.6","ng/L","J","5.6","DL","","TRG","","","31","LOQ","YES",-99","","245.8","1.00","12","","
"WGNA-121117-DUP14","537","RES","320-34181-9","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","37","ng/L","U","16","DL","","TRG","","","92","LOQ","YES",-99","","245.8","1.00","37","","
"WGNA-121117-DUP14","537","RES","320-34181-9","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","5.3","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES",-99","","245.8","1.00","4.1","","
"WGNA-121117-DUP14","537","RES","320-34181-9","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.1","DL","","TRG","","","24","LOQ","YES",-99","","245.8","1.00","20","","
"WGNA-121117-DUP14","537","RES","320-34181-9","TALSAC","STL00993","13C2
PFHxA","39","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","40.7","","245.8","1.00","0","","
"WGNA-121117-DUP14","537","RES","320-34181-9","TALSAC","STL00996","13C2
PFDA","36","ng/L","","-99","DL","","SURR","90","","-99","LOQ","YES","40.7","","245.8","1.00","0","","
"LCS 320-199900/2-A","537","RES","LCS 320-199900/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","223","ng/L","M","6.8","DL","","SPK","100","","40","LOQ","YES","222","","250.00","1.00","16","","
"LCS 320-199900/2-A","537","RES","LCS 320-199900/2-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","110","ng/L","","2.8","DL","","SPK","99","","20","LOQ","YES","111","","250.00","1.00","8.0","","
"LCS 320-199900/2-A","537","RES","LCS 320-199900/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","183","ng/L","","5.5","DL","","SPK","110","","30","LOQ","YES","167","","250.00","1.00","12","","
"LCS 320-199900/2-A","537","RES","LCS 320-199900/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","494","ng/L","","16","DL","","SPK","99","","90","LOQ","YES","500","","250.00","1.00","36","","
"LCS 320-199900/2-A","537","RES","LCS 320-199900/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","62.1","ng/L","","1.9","DL","","SPK","112","","10","LOQ","YES","55.6","","250.00","1.00","4.0","","
"LCS 320-199900/2-A","537","RES","LCS 320-199900/2-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","109","ng/L","","8.0","DL","","SPK","98","","24","LOQ","YES","111","","250.00","1.00","20","","
"LCS 320-199900/2-A","537","RES","LCS 320-199900/2-A","TALSAC","STL00993","13C2
PFHxA","38.7","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","40.0","","250.00","1.00","0","","
"LCS 320-199900/2-A","537","RES","LCS 320-199900/2-A","TALSAC","STL00996","13C2
PFDA","39.0","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","40.0","","250.00","1.00","0","","
"LCSD 320-199900/3-A","537","RES","LCSD 320-199900/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic

acid (PFOS),"216","ng/L","M","6.8","DL","","SPK","97","3","40","LOQ","YES","222","LCS 320-199900/2-A","250.00","1.00","16",""
"LCSD 320-199900/3-A","537","RES","LCSD 320-199900/3-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","109","ng/L","","2.8","DL","","SPK","98","1","20","LOQ","YES","111","LCS 320-199900/2-A","250.00","1.00","8.0",""
"LCSD 320-199900/3-A","537","RES","LCSD 320-199900/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","174","ng/L","","5.5","DL","","SPK","104","5","30","LOQ","YES","167","LCS 320-199900/2-A","250.00","1.00","12",""
"LCSD 320-199900/3-A","537","RES","LCSD 320-199900/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","480","ng/L","","16","DL","","SPK","96","3","90","LOQ","YES","500","LCS 320-199900/2-A","250.00","1.00","36",""
"LCSD 320-199900/3-A","537","RES","LCSD 320-199900/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","60.0","ng/L","","1.9","DL","","SPK","108","3","10","LOQ","YES","55.6","LCS 320-199900/2-A","250.00","1.00","4.0",""
"LCSD 320-199900/3-A","537","RES","LCSD 320-199900/3-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","106","ng/L","","8.0","DL","","SPK","95","3","24","LOQ","YES","111","LCS 320-199900/2-A","250.00","1.00","20",""
"LCSD 320-199900/3-A","537","RES","LCSD 320-199900/3-A","TALSAC","STL00993","13C2 PFHxA","38.8","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","40.0","LCS 320-199900/2-A","250.00","1.00","0",""
"LCSD 320-199900/3-A","537","RES","LCSD 320-199900/3-A","TALSAC","STL00996","13C2 PFDA","41.1","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","40.0","LCS 320-199900/2-A","250.00","1.00","0",""
"MB 320-199900/1-A","537","RES","MB 320-199900/1-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 320-199900/1-A","537","RES","MB 320-199900/1-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 320-199900/1-A","537","RES","MB 320-199900/1-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 320-199900/1-A","537","RES","MB 320-199900/1-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 320-199900/1-A","537","RES","MB 320-199900/1-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 320-199900/1-A","537","RES","MB 320-199900/1-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",""
"MB 320-199900/1-A","537","RES","MB 320-199900/1-A","TALSAC","STL00993","13C2 PFHxA","37.3","ng/L","","-99","DL","","SURR","93","","-99","LOQ","YES","40.0","","250.00","1.00","0",""
"MB 320-199900/1-A","537","RES","MB 320-199900/1-A","TALSAC","STL00996","13C2 PFDA","38.3","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","40.0","","250.00","1.00","0",""
"Unknown","Unknown","WGNA-121117-RW-0488","12/11/2017 11:40","AQ","320-34181-1","NM","","2.10","537","METHOD","RES","12/14/2017 12:48","12/19/2017 20:54","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-200646","320-34181-1","12/12/2017 09:55","12/13/2017 17:25",""
"Unknown","Unknown","WGNA-121117-FRB-0488","12/11/2017 11:35","AQ","320-34181-2","FB","","2.10","537","METHOD","RES","12/14/2017 12:48","12/19/2017 20:59","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-200646","320-34181-1","12/12/2017 09:55","12/13/2017 17:25",""
"Unknown","Unknown","NAWC-121117-RW-136","12/11/2017 12:40","AQ","320-34181-3","NM","","2.10","537","METHOD","RES","12/14/2017 12:48","12/19/2017 21:03","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-200646","320-34181-1","12/12/2017 09:55","12/13/2017 17:25",""
"Unknown","Unknown","NAWC-121117-FRB-136","12/11/2017 12:35","AQ","320-34181-4","FB","","2.10","537","METHOD","RES","12/14/2017 12:48","12/19/2017 21:08","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-

200646","320-34181-1","12/12/2017 09:55","12/13/2017 17:25",""
"Unknown","Unknown","NAWC-121117-RW-040","12/11/2017 13:10","AQ","320-34181-
5","NM","","2.10","537","METHOD","RES","12/14/2017 12:48","12/19/2017
21:13","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-
200646","320-34181-1","12/12/2017 09:55","12/13/2017 17:25",""
"Unknown","Unknown","NAWC-121117-FRB-040","12/11/2017 13:05","AQ","320-34181-
6","FB","","2.10","537","METHOD","RES","12/14/2017 12:48","12/19/2017
21:17","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-
200646","320-34181-1","12/12/2017 09:55","12/13/2017 17:25",""
"Unknown","Unknown","WGNA-121117-RW-4846","12/11/2017 14:10","AQ","320-34181-
7","NM","","2.10","537","METHOD","RES","12/14/2017 12:48","12/19/2017
21:22","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-
200646","320-34181-1","12/12/2017 09:55","12/13/2017 17:25",""
"Unknown","Unknown","WGNA-121117-FRB-4846","12/11/2017 14:05","AQ","320-34181-
8","FB","","2.10","537","METHOD","RES","12/14/2017 12:48","12/19/2017
21:36","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-
200767","320-34181-1","12/12/2017 09:55","12/13/2017 17:25",""
"Unknown","Unknown","WGNA-121117-DUP14","12/11/2017 07:00","AQ","320-34181-
9","FD","","2.10","537","METHOD","RES","12/14/2017 12:48","12/19/2017
21:41","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-
200767","320-34181-1","12/12/2017 09:55","12/13/2017 17:25",""
"Unknown","Unknown","LCS 320-199900/2-A","","AQ","LCS 320-199900/2-
A","LCS","","-99","537","METHOD","RES","12/14/2017 12:48","12/19/2017
20:45","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-
200646","320-34181-1","12/14/2017 12:48","12/13/2017 17:25",""
"Unknown","Unknown","LCSD 320-199900/3-A","","AQ","LCSD 320-199900/3-
A","LCSD","","-99","537","METHOD","RES","12/14/2017 12:48","12/19/2017
20:49","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-
200646","320-34181-1","12/14/2017 12:48","12/13/2017 17:25",""
"Unknown","Unknown","MB 320-199900/1-A","","AQ","MB 320-199900/1-
A","MB","","-99","537","METHOD","RES","12/14/2017 12:48","12/19/2017
20:40","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-
200646","320-34181-1","12/14/2017 12:48","12/13/2017 17:25",""



TETRA TECH

INTERNAL CORRESPONDENCE

TO: **A. FREBOWITZ** **DATE:** **JANUARY 11, 2018**
FROM: **TERRI L. SOLOMON** **COPIES:** **DV FILE**
SUBJECT: **ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)**
 NAS JRB WILLOW GROVE
 SAMPLE DELIVERY GROUP (SDG) 320-34181-1

SAMPLES: 4/Field Reagent Blank (FRB)
 NAWC-121117-FRB-040 NAWC-121117-FRB-136
 WGNA-121117-FRB-0488 WGNA-121117-FRB-4846

 5/Drinking Water
 NAWC-121117-RW-040 NAWC-121117-RW-136
 WGNA-121117-RW-0488 WGNA-121117-RW-4846
 WGNA-121117-DUP14

Overview

The sample set for NAS JRB Willow Grove, SDG 320-34181-1, consisted of five (5) drinking water samples and four (4) FRB samples. All samples were analyzed for select perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA) and perfluorooctane sulfonic acid (PFOS). One (1) field duplicate sample pair (WGNA-121117-RW-0488 / WGNA-121117-DUP14) was included in this SDG.

The samples were collected by Tetra Tech on December 11, 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.

Minor

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

TO: A. FREBOWITZ
SDG: 320-34181-1

PAGE 2

Notes

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

| <u>Sample</u> | <u>Associated FRB</u> |
|----------------------|------------------------------|
| NAWC-121117-RW-040 | NAWC-121117-FRB-040 |
| NAWC-121117-RW-136 | NAWC-121117-FRB-136 |
| WGNA-121117-RW-0488 | WGNA-121117-FRB-0488 |
| WGNA-121117-RW-4846 | WGNA-121117-FRB-4846 |
| WGNA-121117-DUP14 | WGNA-121117-FRB-0488 |

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

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

Executive Summary

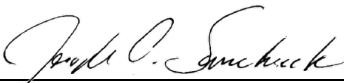
Laboratory Performance: No issues.

Other Factors Affecting Data Quality: Results below the RL were estimated.

The data for these analyses were reviewed with reference to the Environmental Protection Agency document EPA/600/R-08/092, Method 537, "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)", (September 2009) and the US EPA National Functional Guidelines for Organic Data Review (January 2017) as applicable. The text of this report has been formulated to address only those areas affecting data quality.



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



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

Attachments:

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

Data Qualifier Definitions

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

| | |
|-----------|--|
| U | The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method. |
| J | The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit). |
| J+ | The result is an estimated quantity, but the result may be biased high. |
| J- | The result is an estimated quantity, but the result may be biased low. |
| UJ | The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise. |
| R | The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample. |
| UR | The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample. |

Appendix A

Qualified Analytical Results

Qualifier Codes:

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

| | | | | | | | | | | | | | |
|---|------------|---------------------|------|--------|---------------------|------|--------|--------------------|------|--------|--------------------|------|--|
| PROJ_NO: 08005-WE04 SDG: 320-34181-1 FRACTION: PFAS MEDIA: WATER | NSAMPLE | NAWC-121117-FRB-040 | | | NAWC-121117-FRB-136 | | | NAWC-121117-RW-040 | | | NAWC-121117-RW-136 | | |
| | LAB_ID | 320-34181-6 | | | 320-34181-4 | | | 320-34181-5 | | | 320-34181-3 | | |
| | SAMP_DATE | 12/11/2017 | | | 12/11/2017 | | | 12/11/2017 | | | 12/11/2017 | | |
| | 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 | U | | 18 | J | P | 12 | J | P | |
| PERFLUOROBUTANESULFONIC ACID | 36 | U | | 36 | U | | 36 | U | | 37 | U | | |
| PERFLUOROHEPTANOIC ACID | 4 | U | | 4 | U | | 5.2 | J | P | 4.5 | J | P | |
| PERFLUOROHXANESULFONIC ACID | 12 | U | | 12 | U | | 7.3 | J | P | 12 | U | | |
| PERFLUORONONANOIC ACID | 20 | U | | 20 | U | | 20 | U | | 20 | U | | |
| PERFLUOROOCTANE SULFONIC ACID | 16 | U | | 16 | U | | 18 | J | P | 8.6 | J | P | |

| | | | | | | | | | | | | | |
|---|------------|---------------------|------|--------|----------------------|------|--------|----------------------|------|--------|---------------------|------|--|
| PROJ_NO: 08005-WE04 SDG: 320-34181-1 FRACTION: PFAS MEDIA: WATER | NSAMPLE | WGNA-121117-DUP14 | | | WGNA-121117-FRB-0488 | | | WGNA-121117-FRB-4846 | | | WGNA-121117-RW-0488 | | |
| | LAB_ID | 320-34181-9 | | | 320-34181-2 | | | 320-34181-8 | | | 320-34181-1 | | |
| | SAMP_DATE | 12/11/2017 | | | 12/11/2017 | | | 12/11/2017 | | | 12/11/2017 | | |
| | QC_TYPE | FD | | | FB | | | FB | | | NM | | |
| | UNITS | NG/L | | | NG/L | | | NG/L | | | NG/L | | |
| | PCT_SOLIDS | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | | |
| | DUP_OF | WGNA-121117-RW-0488 | | | | | | | | | | | |
| PARAMETER | RESULT | VQL | QLCD | RESULT | VQL | QLCD | RESULT | VQL | QLCD | RESULT | VQL | QLCD | |
| PENTADECAFLUOROOCTANOIC ACID | 12 | J | P | 7.9 | U | | 8 | U | | 11 | J | P | |
| PERFLUOROBUTANESULFONIC ACID | 37 | U | | 35 | U | | 36 | U | | 39 | U | | |
| PERFLUOROHEPTANOIC ACID | 5.3 | J | P | 3.9 | U | | 4 | U | | 5.3 | J | P | |
| PERFLUOROHEXANESULFONIC ACID | 7.6 | J | P | 12 | U | | 12 | U | | 7.3 | J | P | |
| PERFLUORONONANOIC ACID | 20 | U | | 20 | U | | 20 | U | | 22 | U | | |
| PERFLUOROOCTANE SULFONIC ACID | 16 | U | | 16 | U | | 16 | U | | 17 | U | | |

| | | | | |
|---|------------|---------------------|------|--|
| PROJ_NO: 08005-WE04 SDG: 320-34181-1 FRACTION: PFAS MEDIA: WATER | NSAMPLE | WGNA-121117-RW-4846 | | |
| | LAB_ID | 320-34181-7 | | |
| | SAMP_DATE | 12/11/2017 | | |
| | QC_TYPE | NM | | |
| | UNITS | NG/L | | |
| | PCT_SOLIDS | 0.0 | | |
| | DUP_OF | | | |
| PARAMETER | RESULT | VQL | QLCD | |
| PENTADECAFLUOROOCTANOIC ACID | 5.3 | J | P | |
| PERFLUOROBUTANESULFONIC ACID | 36 | U | | |
| PERFLUOROHEPTANOIC ACID | 4.1 | U | | |
| PERFLUOROHEXANESULFONIC ACID | 12 | U | | |
| PERFLUORONONANOIC ACID | 20 | U | | |
| PERFLUOROOCTANE SULFONIC ACID | 16 | U | | |

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: WGNA-121117-RW-0488 Lab Sample ID: 320-34181-1
 Matrix: Water Lab File ID: 2017.12.19_537A_055.d
 Analysis Method: 537 Date Collected: 12/11/2017 11:40
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 228.6(mL) Date Analyzed: 12/19/2017 20:54
 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.: 200646 Units: ng/L

| CAS NO. | COMPOUND NAME | RESULT | Q | LOQ | LOD | DL |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 17 | U | 44 | 17 | 7.4 |
| 335-67-1 | Perfluorooctanoic acid (PFOA) | 11 | J | 22 | 8.7 | 3.1 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 22 | U | 26 | 22 | 8.7 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 7.3 | J | 33 | 13 | 6.0 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 5.3 | J | 11 | 4.4 | 2.1 |
| 375-73-5 | Perfluorobutanesulfonic acid (PFBS) | 39 | U | 98 | 39 | 18 |

| CAS NO. | SURROGATE | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 98 | | 70-130 |
| STL00996 | 13C2 PFDA | 100 | | 70-130 |

Wesley L. Salzman
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: WGNA-121117-FRB-0488 Lab Sample ID: 320-34181-2
 Matrix: Water Lab File ID: 2017.12.19_537A_056.d
 Analysis Method: 537 Date Collected: 12/11/2017 11:35
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 253.6(mL) Date Analyzed: 12/19/2017 20:59
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200646 Units: ng/L

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

| CAS NO. | SURROGATE | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 92 | | 70-130 |
| STL00996 | 13C2 PFDA | 89 | | 70-130 |

Steve L. Selman
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: NAWC-121117-RW-136 Lab Sample ID: 320-34181-3
 Matrix: Water Lab File ID: 2017.12.19_537A_057.d
 Analysis Method: 537 Date Collected: 12/11/2017 12:40
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 246(mL) Date Analyzed: 12/19/2017 21:03
 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.: 200646 Units: ng/L

| CAS NO. | COMPOUND NAME | RESULT | Q | LOQ | LOD | DL |
|-----------|--------------------------------------|--------|----------------|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 8.6 | J | 41 | 16 | 6.9 |
| 335-67-1 | Perfluorooctanoic acid (PFOA) | 12 | J | 20 | 8.1 | 2.8 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 20 | U M | 24 | 20 | 8.1 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 12 | U M | 30 | 12 | 5.6 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 4.5 | J | 10 | 4.1 | 1.9 |
| 375-73-5 | Perfluorobutanesulfonic acid (PFBS) | 37 | U | 91 | 37 | 16 |

| CAS NO. | SURROGATE | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 85 | | 70-130 |
| STL00996 | 13C2 PFDA | 87 | | 70-130 |

Amir L. Salameh
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: NAWC-121117-FRB-136 Lab Sample ID: 320-34181-4
 Matrix: Water Lab File ID: 2017.12.19_537A_058.d
 Analysis Method: 537 Date Collected: 12/11/2017 12:35
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 248.7(mL) Date Analyzed: 12/19/2017 21:08
 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.: 200646 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 | 99 | | 70-130 |
| STL00996 | 13C2 PFDA | 95 | | 70-130 |

Steve J. Salmeron
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: NAWC-121117-RW-040 Lab Sample ID: 320-34181-5
 Matrix: Water Lab File ID: 2017.12.19_537A_059.d
 Analysis Method: 537 Date Collected: 12/11/2017 13:10
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 248.4 (mL) Date Analyzed: 12/19/2017 21:13
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200646 Units: ng/L

| CAS NO. | COMPOUND NAME | RESULT | Q | LOQ | LOD | DL |
|-----------|--------------------------------------|--------|----------------|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 18 | J M | 40 | 16 | 6.8 |
| 335-67-1 | Perfluorooctanoic acid (PFOA) | 18 | J | 20 | 8.1 | 2.8 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 20 | U | 24 | 20 | 8.1 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 7.3 | J | 30 | 12 | 5.5 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 5.2 | J | 10 | 4.0 | 1.9 |
| 375-73-5 | Perfluorobutanesulfonic acid (PFBS) | 36 | U | 91 | 36 | 16 |

| CAS NO. | SURROGATE | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 90 | | 70-130 |
| STL00996 | 13C2 PFDA | 97 | | 70-130 |

Ali L. Salem
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: NAWC-121117-FRB-040 Lab Sample ID: 320-34181-6
 Matrix: Water Lab File ID: 2017.12.19_537A_060.d
 Analysis Method: 537 Date Collected: 12/11/2017 13:05
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 247.4 (mL) Date Analyzed: 12/19/2017 21:17
 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.: 200646 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 | 92 | | 70-130 |
| STL00996 | 13C2 PFDA | 98 | | 70-130 |

Ali L. Salem
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: WGNA-121117-RW-4846 Lab Sample ID: 320-34181-7
 Matrix: Water Lab File ID: 2017.12.19_537A_061.d
 Analysis Method: 537 Date Collected: 12/11/2017 14:10
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 246.8 (mL) Date Analyzed: 12/19/2017 21:22
 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.: 200646 Units: ng/L

| CAS NO. | COMPOUND NAME | RESULT | Q | LOQ | LOD | DL |
|-----------|--------------------------------------|--------|----------------|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 16 | U M | 41 | 16 | 6.9 |
| 335-67-1 | Perfluorooctanoic acid (PFOA) | 5.3 | J | 20 | 8.1 | 2.8 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 20 | U | 24 | 20 | 8.1 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 12 | U M | 30 | 12 | 5.6 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 4.1 | U M | 10 | 4.1 | 1.9 |
| 375-73-5 | Perfluorobutanesulfonic acid (PFBS) | 36 | U M | 91 | 36 | 16 |

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

Atqui L. Salaman
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: WGNA-121117-FRB-4846 Lab Sample ID: 320-34181-8
 Matrix: Water Lab File ID: 2017.12.19_537A_064.d
 Analysis Method: 537 Date Collected: 12/11/2017 14:05
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 250.3(mL) Date Analyzed: 12/19/2017 21:36
 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.: 200767 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 | 91 | | 70-130 |
| STL00996 | 13C2 PFDA | 98 | | 70-130 |

Wesley L. Selman
01/11/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: WGNA-121117-DUP14 Lab Sample ID: 320-34181-9
 Matrix: Water Lab File ID: 2017.12.19_537A_065.d
 Analysis Method: 537 Date Collected: 12/11/2017 07:00
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 245.8 (mL) Date Analyzed: 12/19/2017 21:41
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200767 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) | 12 | J | 20 | 8.1 | 2.8 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 20 | U | 24 | 20 | 8.1 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 7.6 | J | 31 | 12 | 5.6 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 5.3 | 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 | 96 | | 70-130 |
| STL00996 | 13C2 PFDA | 90 | | 70-130 |

Maria L. Salmeron
01/11/2018

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: WGNA-121117-RW-0488 Lab Sample ID: 320-34181-1
 Matrix: Water Lab File ID: 2017.12.19_537A_055.d
 Analysis Method: 537 Date Collected: 12/11/2017 11:40
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 228.6(mL) Date Analyzed: 12/19/2017 20:54
 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.: 200646 Units: ng/L

| CAS NO. | COMPOUND NAME | RESULT | Q | LOQ | LOD | DL |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 17 | U | 44 | 17 | 7.4 |
| 335-67-1 | Perfluorooctanoic acid (PFOA) | 11 | J | 22 | 8.7 | 3.1 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 22 | U | 26 | 22 | 8.7 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 7.3 | J | 33 | 13 | 6.0 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 5.3 | J | 11 | 4.4 | 2.1 |
| 375-73-5 | Perfluorobutanesulfonic acid (PFBS) | 39 | U | 98 | 39 | 18 |

| CAS NO. | SURROGATE | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 98 | | 70-130 |
| STL00996 | 13C2 PFDA | 100 | | 70-130 |

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: WGNA-121117-FRB-0488 Lab Sample ID: 320-34181-2
 Matrix: Water Lab File ID: 2017.12.19_537A_056.d
 Analysis Method: 537 Date Collected: 12/11/2017 11:35
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 253.6(mL) Date Analyzed: 12/19/2017 20:59
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200646 Units: ng/L

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

| CAS NO. | SURROGATE | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 92 | | 70-130 |
| STL00996 | 13C2 PFDA | 89 | | 70-130 |

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: NAWC-121117-RW-136 Lab Sample ID: 320-34181-3
 Matrix: Water Lab File ID: 2017.12.19_537A_057.d
 Analysis Method: 537 Date Collected: 12/11/2017 12:40
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 246(mL) Date Analyzed: 12/19/2017 21:03
 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.: 200646 Units: ng/L

| CAS NO. | COMPOUND NAME | RESULT | Q | LOQ | LOD | DL |
|-----------|--------------------------------------|--------|-----|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 8.6 | J | 41 | 16 | 6.9 |
| 335-67-1 | Perfluorooctanoic acid (PFOA) | 12 | J | 20 | 8.1 | 2.8 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 20 | U M | 24 | 20 | 8.1 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 12 | U M | 30 | 12 | 5.6 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 4.5 | J | 10 | 4.1 | 1.9 |
| 375-73-5 | Perfluorobutanesulfonic acid (PFBS) | 37 | U | 91 | 37 | 16 |

| CAS NO. | SURROGATE | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 85 | | 70-130 |
| STL00996 | 13C2 PFDA | 87 | | 70-130 |

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: NAWC-121117-FRB-136 Lab Sample ID: 320-34181-4
 Matrix: Water Lab File ID: 2017.12.19_537A_058.d
 Analysis Method: 537 Date Collected: 12/11/2017 12:35
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 248.7(mL) Date Analyzed: 12/19/2017 21:08
 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.: 200646 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 | 99 | | 70-130 |
| STL00996 | 13C2 PFDA | 95 | | 70-130 |

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: NAWC-121117-RW-040 Lab Sample ID: 320-34181-5
 Matrix: Water Lab File ID: 2017.12.19_537A_059.d
 Analysis Method: 537 Date Collected: 12/11/2017 13:10
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 248.4 (mL) Date Analyzed: 12/19/2017 21:13
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200646 Units: ng/L

| CAS NO. | COMPOUND NAME | RESULT | Q | LOQ | LOD | DL |
|-----------|--------------------------------------|--------|-----|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 18 | J M | 40 | 16 | 6.8 |
| 335-67-1 | Perfluorooctanoic acid (PFOA) | 18 | J | 20 | 8.1 | 2.8 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 20 | U | 24 | 20 | 8.1 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 7.3 | J | 30 | 12 | 5.5 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 5.2 | J | 10 | 4.0 | 1.9 |
| 375-73-5 | Perfluorobutanesulfonic acid (PFBS) | 36 | U | 91 | 36 | 16 |

| CAS NO. | SURROGATE | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 90 | | 70-130 |
| STL00996 | 13C2 PFDA | 97 | | 70-130 |

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: NAWC-121117-FRB-040 Lab Sample ID: 320-34181-6
 Matrix: Water Lab File ID: 2017.12.19_537A_060.d
 Analysis Method: 537 Date Collected: 12/11/2017 13:05
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 247.4 (mL) Date Analyzed: 12/19/2017 21:17
 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.: 200646 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 | 92 | | 70-130 |
| STL00996 | 13C2 PFDA | 98 | | 70-130 |

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: WGNA-121117-RW-4846 Lab Sample ID: 320-34181-7
 Matrix: Water Lab File ID: 2017.12.19_537A_061.d
 Analysis Method: 537 Date Collected: 12/11/2017 14:10
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 246.8 (mL) Date Analyzed: 12/19/2017 21:22
 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.: 200646 Units: ng/L

| CAS NO. | COMPOUND NAME | RESULT | Q | LOQ | LOD | DL |
|-----------|--------------------------------------|--------|-----|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 16 | U M | 41 | 16 | 6.9 |
| 335-67-1 | Perfluorooctanoic acid (PFOA) | 5.3 | J | 20 | 8.1 | 2.8 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 20 | U | 24 | 20 | 8.1 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 12 | U M | 30 | 12 | 5.6 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 4.1 | U M | 10 | 4.1 | 1.9 |
| 375-73-5 | Perfluorobutanesulfonic acid (PFBS) | 36 | U M | 91 | 36 | 16 |

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

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: WGNA-121117-FRB-4846 Lab Sample ID: 320-34181-8
 Matrix: Water Lab File ID: 2017.12.19_537A_064.d
 Analysis Method: 537 Date Collected: 12/11/2017 14:05
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 250.3(mL) Date Analyzed: 12/19/2017 21:36
 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.: 200767 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 | 91 | | 70-130 |
| STL00996 | 13C2 PFDA | 98 | | 70-130 |

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: WGNA-121117-DUP14 Lab Sample ID: 320-34181-9
 Matrix: Water Lab File ID: 2017.12.19_537A_065.d
 Analysis Method: 537 Date Collected: 12/11/2017 07:00
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 245.8 (mL) Date Analyzed: 12/19/2017 21:41
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200767 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) | 12 | J | 20 | 8.1 | 2.8 |
| 375-95-1 | Perfluorononanoic acid (PFNA) | 20 | U | 24 | 20 | 8.1 |
| 355-46-4 | Perfluorohexanesulfonic acid (PFHxS) | 7.6 | J | 31 | 12 | 5.6 |
| 375-85-9 | Perfluoroheptanoic acid (PFHpA) | 5.3 | 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 | 96 | | 70-130 |
| STL00996 | 13C2 PFDA | 90 | | 70-130 |

Appendix C

Support Documentation

| ANALYTE | ORIGINAL | DUPLICATE | | RL | RPD | RPD > 50% | ORIGINAL | DUPLICATE | DIFFERENCE >2XRL |
|--------------------------------------|----------|-----------|-------------|-------|-------|-----------|-------------|-----------|------------------|
| | RW-0488 | DUP14 | SAMPLE CONC | | | | SAMPLE CONC | | |
| Perfluorooctanoic acid (PFOA) | 11 | 12 | 22 | 8.696 | FALSE | FALSE | FALSE | FALSE | FALSE |
| Perfluoroheptanoic acid (PFHpA) | 5.3 | 5.3 | 11 | 0.000 | FALSE | FALSE | FALSE | FALSE | FALSE |
| Perfluorohexanesulfonic acid (PFHxS) | 7.3 | 7.6 | 33 | 4.027 | FALSE | FALSE | FALSE | FALSE | FALSE |

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

Chain of Custody Record

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.

Regulatory Program: DW NPDES RCRA Other:

| | | | | | | | | | |
|--|--------------------|--|--|--|---|------------------------------|-------------------------------|--|-------------------------------|
| Client Contact | | Project Manager: Andy Frebowitz | | Site Contact: Mary Kay Bond | | Date: 12/11/2017 | | COC No: | |
| TetraTech 234 Mall Boulevard Suite 260 King of Prussia, PA 19406 610-382-1174 610-491-9688 Project Name: WE04 Site: WE04 P O # 1132358 (through EarthToxics) | | Tel/Fax: 610.382.1170 | | Lab Contact: Dave Alltucker | | Carrier: FedEx | | 1 of 1 COCs | |
| | | Analysis Turnaround Time | | Filtered Sample (Y/N) Perform MS / MSD (Y/N) EPA 537 UCMR3 | | | | Sampler: Mary Kay Bond For Lab Use Only: Walk-in Client: Lab Sampling: | |
| | | <input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below 21 <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day | | | | | | | |
| Sample Identification | Sample Date | Sample Time | Sample Type (C=Comp, G=Grab) | Matrix | # of Cont. | Filtered Sample (Y/N) | Perform MS / MSD (Y/N) | EPA 537 UCMR3 | Sample Specific Notes: |
| WGNA-121117-RW-0488 | 12/11/2017 | 11:40 | G | DW | 2 | N | N | Y | |
| WGNA-121117-FRB-0488 | 12/11/2017 | 11:35 | G | DW | 2 | N | N | Y | Field Reagent Blank |
| NAWC-121117-RW-136 | 12/11/2017 | 12:40 | G | DW | 2 | N | N | Y | |
| NAWC-121117-FRB-136 | 12/11/2017 | 12:35 | G | DW | 2 | N | N | Y | Field Reagent Blank |
| NAWC-121117-RW-040 | 12/11/2017 | 13:10 | G | DW | 2 | N | N | Y | |
| NAWC-121117-FRB-040 | 12/11/2017 | 13:05 | G | DW | 2 | N | N | Y | Field Reagent Blank |
| WGNA-121117-RW-4846 | 12/11/2017 | 14:10 | G | DW | 2 | N | N | Y | |
| WGNA-121117-FRB-4846 | 12/11/2017 | 14:05 | G | DW | 2 | N | N | Y | Field Reagent Blank |
| WGNA-121117-DUP14 | 12/11/2017 | 07:00 | G | DW | 2 | N | N | Y | Duplicate |
| <p>Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other: Trizma</p> <p>Possible Hazard Identification: 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 B <input type="checkbox"/> Unknown</p> <p>Fed Ex Tracking: 7709 5314 7314</p> | | | | | | | | | |
| Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) | | | | | <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months | | | | |
| Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No | | Custody Seal No.: | | Cooler Temp. (°C): Obs'd: 2.1 | | Corr'd: - | | Therm ID No.: 41-3 | |
| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: | Received in Laboratory by: | | Company: | Date/Time: |
| <i>[Signature]</i> | Tetra Tech | 12/11/2017 16:00 | <i>[Signature]</i> | Taus | 12/12/17 955 | | | | |
| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: | | | | |
| Relinquished by: | Company: | Date/Time: | Received in Laboratory by: | Company: | Date/Time: | | | | |



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Job Narrative
320-34181-1

Receipt

The samples were received on 12/12/2017 9:55 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.1° C.

LCMS

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

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

Organic Prep

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-199900.

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

Method Summary

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

TestAmerica Job ID: 320-34181-1

| 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: 320-34181-1

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

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---------------|----------------------|--------|----------------|----------------|
| 320-34181-1 | WGNA-121117-RW-0488 | Water | 12/11/17 11:40 | 12/12/17 09:55 |
| 320-34181-2 | WGNA-121117-FRB-0488 | Water | 12/11/17 11:35 | 12/12/17 09:55 |
| 320-34181-3 | NAWC-121117-RW-136 | Water | 12/11/17 12:40 | 12/12/17 09:55 |
| 320-34181-4 | NAWC-121117-FRB-136 | Water | 12/11/17 12:35 | 12/12/17 09:55 |
| 320-34181-5 | NAWC-121117-RW-040 | Water | 12/11/17 13:10 | 12/12/17 09:55 |
| 320-34181-6 | NAWC-121117-FRB-040 | Water | 12/11/17 13:05 | 12/12/17 09:55 |
| 320-34181-7 | WGNA-121117-RW-4846 | Water | 12/11/17 14:10 | 12/12/17 09:55 |
| 320-34181-8 | WGNA-121117-FRB-4846 | Water | 12/11/17 14:05 | 12/12/17 09:55 |
| 320-34181-9 | WGNA-121117-DUP14 | Water | 12/11/17 07:00 | 12/12/17 09:55 |

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-34181-1

SDG No.: _____

Matrix: Water

Level: Low

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

| Client Sample ID | Lab Sample ID | PFHxA # | PFDA # |
|----------------------|------------------------|---------|--------|
| WGNA-121117-RW-0488 | 320-34181-1 | 98 | 100 |
| WGNA-121117-FRB-0488 | 320-34181-2 | 92 | 89 |
| NAWC-121117-RW-136 | 320-34181-3 | 85 | 87 |
| NAWC-121117-FRB-136 | 320-34181-4 | 99 | 95 |
| NAWC-121117-RW-040 | 320-34181-5 | 90 | 97 |
| NAWC-121117-FRB-040 | 320-34181-6 | 92 | 98 |
| WGNA-121117-RW-4846 | 320-34181-7 | 88 | 87 |
| WGNA-121117-FRB-4846 | 320-34181-8 | 91 | 98 |
| WGNA-121117-DUP14 | 320-34181-9 | 96 | 90 |
| | MB 320-199900/1-A | 93 | 96 |
| | LCS 320-199900/2-A | 97 | 98 |
| | LCSD 320-199900/3-A | 97 | 103 |

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.: 320-34181-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.12.19_537A_053.d
 Lab ID: LCS 320-199900/2-A Client ID: _____

| COMPOUND | SPIKE ADDED (ng/L) | LCS CONCENTRATION (ng/L) | LCS % REC | QC LIMITS REC | # |
|---|--------------------------|--------------------------------|-----------------|---------------------|---|
| Perfluorooctanesulfonic acid (PFOS) | 222 | 223 | 100 | 70-130 | M |
| Perfluorooctanoic acid (PFOA) | 111 | 110 | 99 | 70-130 | |
| Perfluorononanoic acid (PFNA) | 111 | 109 | 98 | 70-130 | |
| Perfluorohexanesulfonic acid (PFHxS) | 167 | 183 | 110 | 70-130 | |
| Perfluoroheptanoic acid (PFHpA) | 55.6 | 62.1 | 112 | 70-130 | |
| Perfluorobutanesulfonic acid (PFBS) | 500 | 494 | 99 | 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.: 320-34181-1

SDG No.: _____

Matrix: Water Level: Low Lab File ID: 2017.12.19_537A_054.d

Lab ID: LCSD 320-199900/3-A Client ID: _____

| COMPOUND | SPIKE ADDED (ng/L) | LCSD CONCENTRATION (ng/L) | LCSD % REC | % RPD | QC LIMITS | | # |
|--------------------------------------|--------------------------|---------------------------------|------------------|----------|-----------|--------|---|
| | | | | | RPD | REC | |
| Perfluorooctanesulfonic acid (PFOS) | 222 | 216 | 97 | 3 | 30 | 70-130 | M |
| Perfluorooctanoic acid (PFOA) | 111 | 109 | 98 | 1 | 30 | 70-130 | |
| Perfluorononanoic acid (PFNA) | 111 | 106 | 95 | 3 | 30 | 70-130 | |
| Perfluorohexanesulfonic acid (PFHxS) | 167 | 174 | 104 | 5 | 30 | 70-130 | |
| Perfluoroheptanoic acid (PFHpA) | 55.6 | 60.0 | 108 | 3 | 30 | 70-130 | |
| Perfluorobutanesulfonic acid (PFBS) | 500 | 480 | 96 | 3 | 30 | 70-130 | |

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Lab File ID: 2017.12.19_537A_052.d Lab Sample ID: MB 320-199900/1-A
 Matrix: Water Date Extracted: 12/14/2017 12:48
 Instrument ID: A8_N Date Analyzed: 12/19/2017 20:40
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

| CLIENT SAMPLE ID | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED |
|----------------------|---------------------|-----------------------|------------------|
| | LCS 320-199900/2-A | 2017.12.19_537A_053.d | 12/19/2017 20:45 |
| | LCSD 320-199900/3-A | 2017.12.19_537A_054.d | 12/19/2017 20:49 |
| WGNA-121117-RW-0488 | 320-34181-1 | 2017.12.19_537A_055.d | 12/19/2017 20:54 |
| WGNA-121117-FRB-0488 | 320-34181-2 | 2017.12.19_537A_056.d | 12/19/2017 20:59 |
| NAWC-121117-RW-136 | 320-34181-3 | 2017.12.19_537A_057.d | 12/19/2017 21:03 |
| NAWC-121117-FRB-136 | 320-34181-4 | 2017.12.19_537A_058.d | 12/19/2017 21:08 |
| NAWC-121117-RW-040 | 320-34181-5 | 2017.12.19_537A_059.d | 12/19/2017 21:13 |
| NAWC-121117-FRB-040 | 320-34181-6 | 2017.12.19_537A_060.d | 12/19/2017 21:17 |
| WGNA-121117-RW-4846 | 320-34181-7 | 2017.12.19_537A_061.d | 12/19/2017 21:22 |
| WGNA-121117-FRB-4846 | 320-34181-8 | 2017.12.19_537A_064.d | 12/19/2017 21:36 |
| WGNA-121117-DUP14 | 320-34181-9 | 2017.12.19_537A_065.d | 12/19/2017 21:41 |

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-199900/1-A
 Matrix: Water Lab File ID: 2017.12.19_537A_052.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 250.00 (mL) Date Analyzed: 12/19/2017 20:40
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200646 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 | 93 | | 70-130 |
| STL00996 | 13C2 PFDA | 96 | | 70-130 |

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 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 | | |
| CCV 320-200646/1 CCVIS | 1495978 | 1.81 | 3096651 | 2.06 | | |
| MB 320-199900/1-A | 1460001 | 1.81 | 3186036 | 2.07 | | |
| LCS 320-199900/2-A | 1457783 | 1.81 | 3055078 | 2.07 | | |
| LCSD 320-199900/3-A | 1467291 | 1.81 | 3102295 | 2.07 | | |
| 320-34181-1 | WGNA-121117-RW-0488 | 1456980 | 1.81 | 3037745 | 2.06 | |
| 320-34181-2 | WGNA-121117-FRB-0488 | 1544196 | 1.81 | 3255698 | 2.06 | |
| 320-34181-3 | NAWC-121117-RW-136 | 1574402 | 1.81 | 3341880 | 2.06 | |
| 320-34181-4 | NAWC-121117-FRB-136 | 1478101 | 1.81 | 3156769 | 2.06 | |
| 320-34181-5 | NAWC-121117-RW-040 | 1556701 | 1.81 | 3369191 | 2.07 | |
| 320-34181-6 | NAWC-121117-FRB-040 | 1531447 | 1.81 | 3175241 | 2.06 | |
| 320-34181-7 | WGNA-121117-RW-4846 | 1486642 | 1.81 | 3153123 | 2.07 | |
| CCV 320-200646/13 CCVIS | 1490421 | 1.81 | 3162377 | 2.06 | | |
| CCV 320-200767/13 CCVIS | 1490421 | 1.81 | 3162377 | 2.06 | | |
| 320-34181-8 | WGNA-121117-FRB-4846 | 1519488 | 1.81 | 3290304 | 2.07 | |
| 320-34181-9 | WGNA-121117-DUP14 | 1565140 | 1.81 | 3193781 | 2.06 | |
| CCV 320-200767/21 CCVIS | 1464558 | 1.81 | 3048007 | 2.07 | | |

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Sample No.: CCV 320-200646/1 Date Analyzed: 12/19/2017 20:31
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.19_537A_050 Heated Purge: (Y/N) N
 Calibration ID: 36012

| | 13PFOA | | PFOS | | AREA # | RT # |
|---------------------|----------------------|---------|---------|---------|--------|------|
| | AREA # | RT # | AREA # | RT # | | |
| 12/24 HOUR STD | 1495978 | 1.81 | 3096651 | 2.06 | | |
| UPPER LIMIT | 2094369 | 2.31 | 4335311 | 2.56 | | |
| LOWER LIMIT | 1047185 | 1.31 | 2167656 | 1.56 | | |
| LAB SAMPLE ID | CLIENT SAMPLE ID | | | | | |
| MB 320-199900/1-A | | 1460001 | 1.81 | 3186036 | 2.07 | |
| LCS 320-199900/2-A | | 1457783 | 1.81 | 3055078 | 2.07 | |
| LCSD 320-199900/3-A | | 1467291 | 1.81 | 3102295 | 2.07 | |
| 320-34181-1 | WGNA-121117-RW-0488 | 1456980 | 1.81 | 3037745 | 2.06 | |
| 320-34181-2 | WGNA-121117-FRB-0488 | 1544196 | 1.81 | 3255698 | 2.06 | |
| 320-34181-3 | NAWC-121117-RW-136 | 1574402 | 1.81 | 3341880 | 2.06 | |
| 320-34181-4 | NAWC-121117-FRB-136 | 1478101 | 1.81 | 3156769 | 2.06 | |
| 320-34181-5 | NAWC-121117-RW-040 | 1556701 | 1.81 | 3369191 | 2.07 | |
| 320-34181-6 | NAWC-121117-FRB-040 | 1531447 | 1.81 | 3175241 | 2.06 | |
| 320-34181-7 | WGNA-121117-RW-4846 | 1486642 | 1.81 | 3153123 | 2.07 | |

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Sample No.: CCV 320-200646/13 Date Analyzed: 12/19/2017 21:27
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.19_537A_062 Heated Purge: (Y/N) N
 Calibration ID: 36012

| | 13PFOA | | PFOS | | AREA # | RT # |
|---------------------|----------------------|---------|---------|---------|--------|------|
| | AREA # | RT # | AREA # | RT # | | |
| 12/24 HOUR STD | 1490421 | 1.81 | 3162377 | 2.06 | | |
| UPPER LIMIT | 2086589 | 2.31 | 4427328 | 2.56 | | |
| LOWER LIMIT | 1043295 | 1.31 | 2213664 | 1.56 | | |
| LAB SAMPLE ID | CLIENT SAMPLE ID | | | | | |
| MB 320-199900/1-A | | 1460001 | 1.81 | 3186036 | 2.07 | |
| LCS 320-199900/2-A | | 1457783 | 1.81 | 3055078 | 2.07 | |
| LCSD 320-199900/3-A | | 1467291 | 1.81 | 3102295 | 2.07 | |
| 320-34181-1 | WGNA-121117-RW-0488 | 1456980 | 1.81 | 3037745 | 2.06 | |
| 320-34181-2 | WGNA-121117-FRB-0488 | 1544196 | 1.81 | 3255698 | 2.06 | |
| 320-34181-3 | NAWC-121117-RW-136 | 1574402 | 1.81 | 3341880 | 2.06 | |
| 320-34181-4 | NAWC-121117-FRB-136 | 1478101 | 1.81 | 3156769 | 2.06 | |
| 320-34181-5 | NAWC-121117-RW-040 | 1556701 | 1.81 | 3369191 | 2.07 | |
| 320-34181-6 | NAWC-121117-FRB-040 | 1531447 | 1.81 | 3175241 | 2.06 | |
| 320-34181-7 | WGNA-121117-RW-4846 | 1486642 | 1.81 | 3153123 | 2.07 | |

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Sample No.: CCV 320-200767/13 Date Analyzed: 12/19/2017 21:27
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.19_537A_062 Heated Purge: (Y/N) N
 Calibration ID: 36012

| | 13PFOA | | PFOS | | AREA # | RT # |
|----------------|----------------------|---------|---------|---------|--------|------|
| | AREA # | RT # | AREA # | RT # | | |
| 12/24 HOUR STD | 1490421 | 1.81 | 3162377 | 2.06 | | |
| UPPER LIMIT | 2086589 | 2.31 | 4427328 | 2.56 | | |
| LOWER LIMIT | 1043295 | 1.31 | 2213664 | 1.56 | | |
| LAB SAMPLE ID | CLIENT SAMPLE ID | | | | | |
| 320-34181-8 | WGNA-121117-FRB-4846 | 1519488 | 1.81 | 3290304 | 2.07 | |
| 320-34181-9 | WGNA-121117-DUP14 | 1565140 | 1.81 | 3193781 | 2.06 | |

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Sample No.: CCV 320-200767/21 Date Analyzed: 12/19/2017 22:04
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.19_537A_070 Heated Purge: (Y/N) N
 Calibration ID: 36012

| | 13PFOA | | PFOS | | AREA # | RT # |
|----------------|----------------------|------|---------|------|---------|------|
| | AREA # | RT # | AREA # | RT # | | |
| 12/24 HOUR STD | 1464558 | 1.81 | 3048007 | 2.07 | | |
| UPPER LIMIT | 2050381 | 2.31 | 4267210 | 2.57 | | |
| LOWER LIMIT | 1025191 | 1.31 | 2133605 | 1.57 | | |
| LAB SAMPLE ID | CLIENT SAMPLE ID | | | | | |
| 320-34181-8 | WGNA-121117-FRB-4846 | | 1519488 | 1.81 | 3290304 | 2.07 |
| 320-34181-9 | WGNA-121117-DUP14 | | 1565140 | 1.81 | 3193781 | 2.06 |

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

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

Column used to flag values outside QC limits

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

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1 Analy Batch No.: 192908

SDG No.: _____

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

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

Calibration Files:

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

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

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

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

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1 Analy Batch No.: 192908

SDG No.: _____

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

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

Calibration Files:

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

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

Curve Type Legend:

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

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

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1 Analy Batch No.: 192908

SDG No.: _____

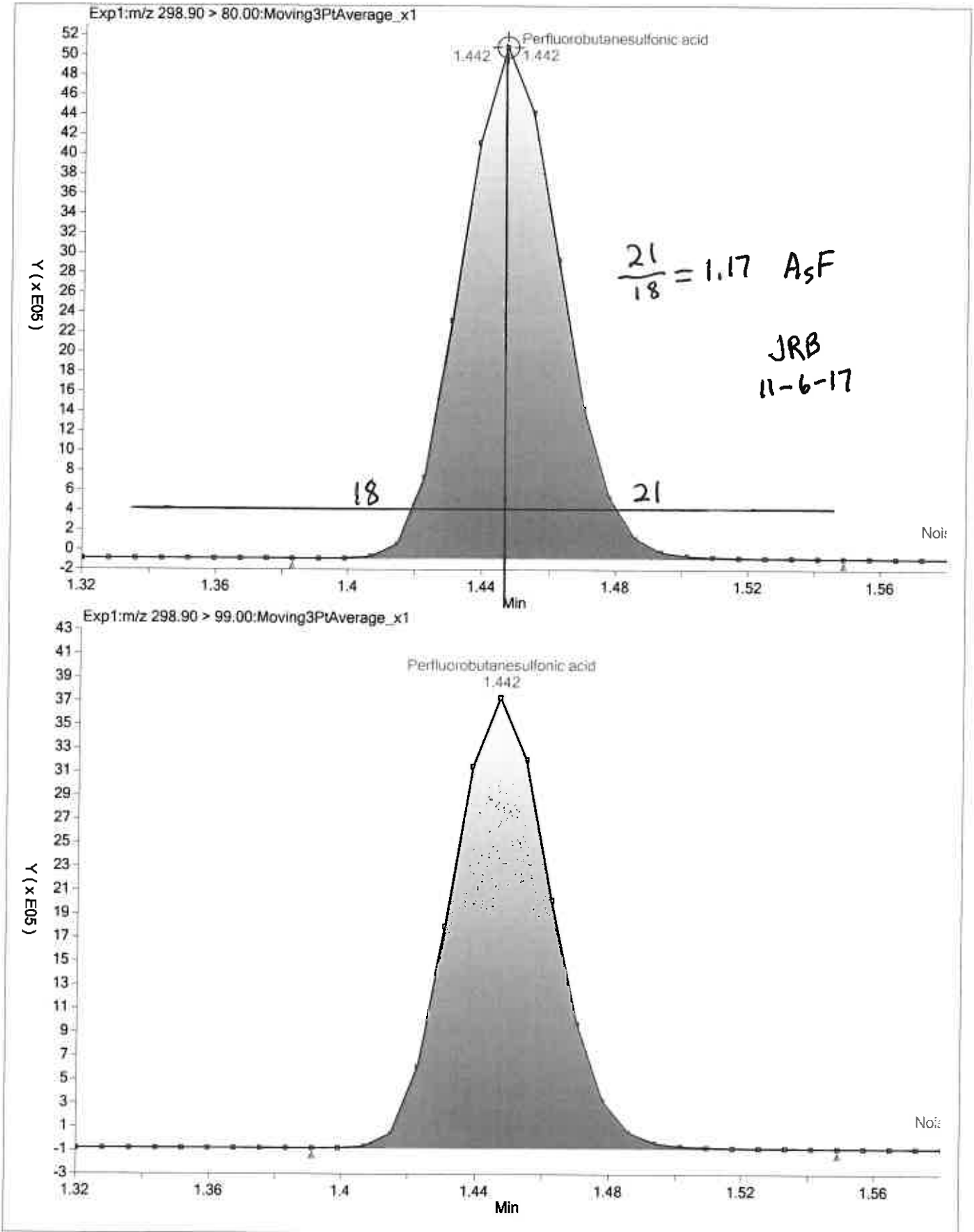
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3 (mm) Heated Purge: (Y/N) N

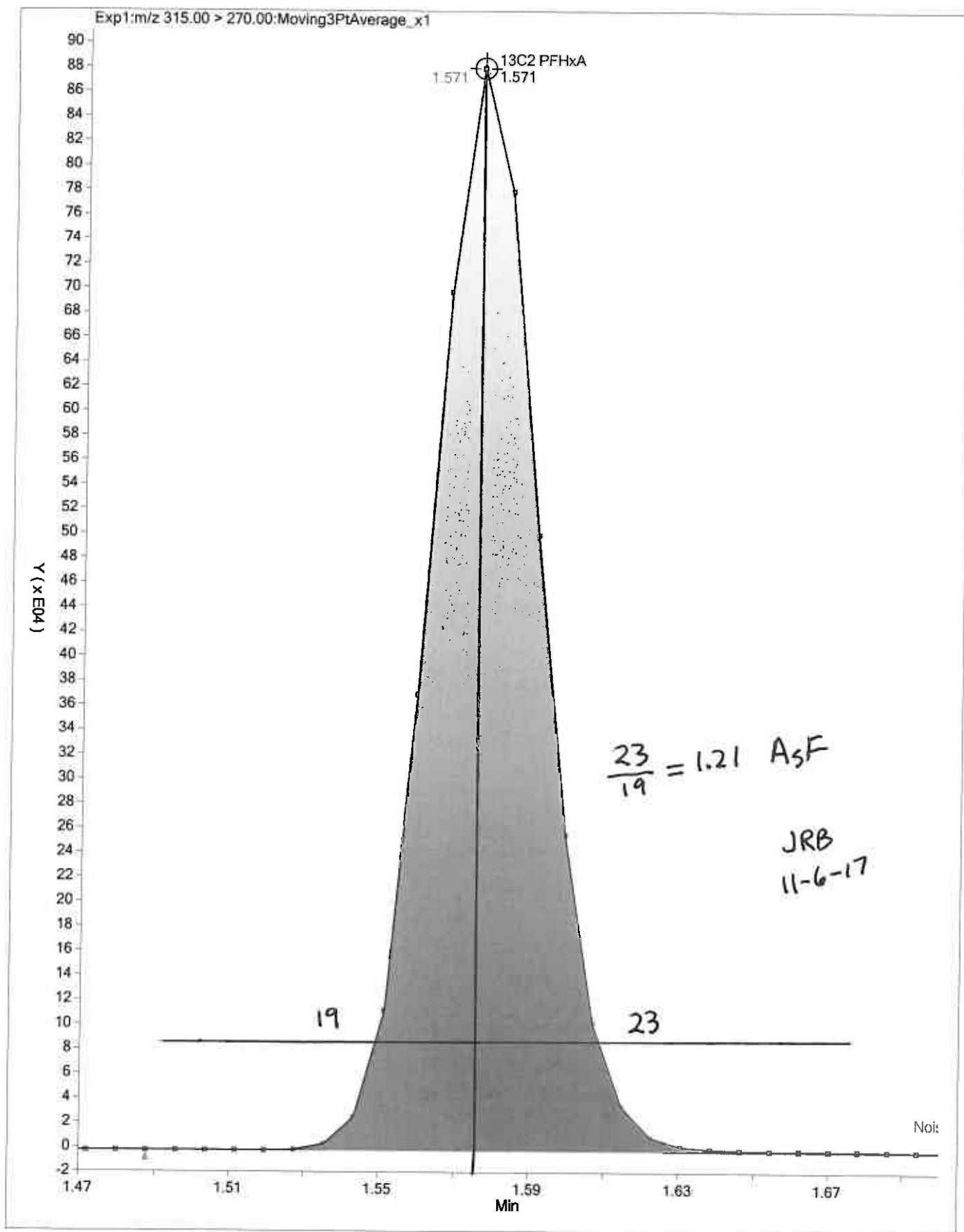
Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

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.: 320-34181-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-192908/11 Calibration Date: 11/03/2017 14:10
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.11.03_537XICAL_011.d Conc. Units: ng/mL

| ANALYTE | CURVE TYPE | AVE RRF | RRF | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D | MAX %D |
|--------------------------------------|------------|---------|--------|---------|-------------|--------------|------|--------|
| Perfluorobutanesulfonic acid (PFBS) | QuaF | | 1.109 | | 20.4 | 20.0 | 1.9 | 50.0 |
| Perfluoroheptanoic acid (PFHpA) | Ave | 0.9369 | 0.9382 | | 2.23 | 2.22 | 0.1 | 50.0 |
| Perfluorohexanesulfonic acid (PFHxS) | Ave | 1.674 | 1.688 | | 6.72 | 6.67 | 0.8 | 50.0 |
| Perfluorooctanoic acid (PFOA) | Ave | 0.9258 | 0.8825 | | 4.24 | 4.45 | -4.7 | 50.0 |
| Perfluorooctanesulfonic acid (PFOS) | Ave | 0.9389 | 0.9176 | | 8.69 | 8.89 | -2.3 | 50.0 |
| Perfluorononanoic acid (PFNA) | Ave | 0.6642 | 0.6625 | | 4.43 | 4.45 | -0.2 | 50.0 |
| 13C2 PFHxA | Ave | 1.100 | 1.068 | | 9.70 | 10.0 | -3.0 | 30.0 |
| 13C2 PFDA | Ave | 0.7652 | 0.7460 | | 9.75 | 10.0 | -2.5 | 30.0 |

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Lab Sample ID: ICV 320-192908/13 Calibration Date: 11/03/2017 14:20
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.11.03_537XICAL_013.d Conc. Units: ng/mL

| ANALYTE | CURVE TYPE | AVE RRF | RRF | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D | MAX %D |
|--------------------------------------|------------|---------|--------|---------|-------------|--------------|-------|--------|
| Perfluorobutanesulfonic acid (PFBS) | QuaF | | 0.8310 | | 83.7 | 100 | -16.4 | 30.0 |
| Perfluoroheptanoic acid (PFHpA) | Ave | 0.9369 | 0.8136 | | 8.68 | 10.0 | -13.2 | 30.0 |
| Perfluorohexanesulfonic acid (PFHxS) | Ave | 1.674 | 1.463 | | 17.5 | 20.1 | -12.6 | 30.0 |
| Perfluorooctanoic acid (PFOA) | Ave | 0.9258 | 0.7995 | | 17.7 | 20.5 | -13.6 | 30.0 |
| Perfluorooctanesulfonic acid (PFOS) | Ave | 0.9389 | 0.8637 | | 18.1 | 19.7 | -8.0 | 30.0 |
| Perfluorononanoic acid (PFNA) | Ave | 0.6642 | 0.6428 | | 19.5 | 20.1 | -3.2 | 30.0 |
| 13C2 PFHxA | Ave | 1.100 | 1.039 | | 9.44 | 10.0 | -5.6 | 30.0 |
| 13C2 PFDA | Ave | 0.7652 | 0.7391 | | 9.66 | 10.0 | -3.4 | 30.0 |

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-200292/1 Calibration Date: 12/18/2017 09:53
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.18_537A_004.d Conc. Units: ng/mL

| ANALYTE | CURVE TYPE | AVE RRF | RRF | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D | MAX %D |
|--------------------------------------|------------|---------|--------|---------|-------------|--------------|------|--------|
| Perfluorobutanesulfonic acid (PFBS) | QuaF | | 1.225 | | 22.6 | 20.0 | 12.9 | 50.0 |
| Perfluoroheptanoic acid (PFHpA) | Ave | 0.9369 | 0.8814 | | 2.09 | 2.22 | -5.9 | 50.0 |
| Perfluorohexanesulfonic acid (PFHxS) | Ave | 1.674 | 1.771 | | 7.05 | 6.67 | 5.8 | 50.0 |
| Perfluorooctanoic acid (PFOA) | Ave | 0.9258 | 0.8987 | | 4.32 | 4.45 | -2.9 | 50.0 |
| Perfluorooctanesulfonic acid (PFOS) | Ave | 0.9389 | 0.9280 | | 8.79 | 8.89 | -1.2 | 50.0 |
| Perfluorononanoic acid (PFNA) | Ave | 0.6642 | 0.6110 | | 4.09 | 4.45 | -8.0 | 50.0 |
| 13C2 PFHxA | Ave | 1.100 | 1.093 | | 9.93 | 10.0 | -0.7 | 30.0 |
| 13C2 PFDA | Ave | 0.7652 | 0.7211 | | 9.42 | 10.0 | -5.8 | 30.0 |

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Lab Sample ID: CCV 320-200646/1 Calibration Date: 12/19/2017 20:31
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.19_537A_050.d Conc. Units: ng/mL

| ANALYTE | CURVE TYPE | AVE RRF | RRF | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D | MAX %D |
|--------------------------------------|------------|---------|--------|---------|-------------|--------------|------|--------|
| Perfluorobutanesulfonic acid (PFBS) | QuaF | | 0.9623 | | 144 | 135 | 6.4 | 30.0 |
| Perfluoroheptanoic acid (PFHpA) | Ave | 0.9369 | 0.9524 | | 15.3 | 15.0 | 1.6 | 30.0 |
| Perfluorohexanesulfonic acid (PFHxS) | Ave | 1.674 | 1.793 | | 48.2 | 45.0 | 7.1 | 30.0 |
| Perfluorooctanoic acid (PFOA) | Ave | 0.9258 | 0.8880 | | 28.8 | 30.0 | -4.1 | 30.0 |
| Perfluorooctanesulfonic acid (PFOS) | Ave | 0.9389 | 0.9364 | | 59.9 | 60.0 | -0.3 | 30.0 |
| Perfluorononanoic acid (PFNA) | Ave | 0.6642 | 0.6144 | | 27.8 | 30.0 | -7.5 | 30.0 |
| 13C2 PFHxA | Ave | 1.100 | 1.132 | | 10.3 | 10.0 | 2.9 | 30.0 |
| 13C2 PFDA | Ave | 0.7652 | 0.7335 | | 9.58 | 10.0 | -4.2 | 30.0 |

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Lab Sample ID: CCV 320-200646/13 Calibration Date: 12/19/2017 21:27
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.19_537A_062.d Conc. Units: ng/mL

| ANALYTE | CURVE TYPE | AVE RRF | RRF | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D | MAX %D |
|--------------------------------------|------------|---------|--------|---------|-------------|--------------|------|--------|
| Perfluorobutanesulfonic acid (PFBS) | QuaF | | 1.111 | | 47.7 | 45.0 | 6.0 | 30.0 |
| Perfluoroheptanoic acid (PFHpA) | Ave | 0.9369 | 0.9480 | | 5.06 | 5.00 | 1.2 | 30.0 |
| Perfluorohexanesulfonic acid (PFHxS) | Ave | 1.674 | 1.748 | | 15.7 | 15.0 | 4.4 | 30.0 |
| Perfluorooctanoic acid (PFOA) | Ave | 0.9258 | 0.8955 | | 9.68 | 10.0 | -3.3 | 30.0 |
| Perfluorooctanesulfonic acid (PFOS) | Ave | 0.9389 | 0.9133 | | 19.5 | 20.0 | -2.7 | 30.0 |
| Perfluorononanoic acid (PFNA) | Ave | 0.6642 | 0.6453 | | 9.72 | 10.0 | -2.8 | 30.0 |
| 13C2 PFHxA | Ave | 1.100 | 1.148 | | 10.4 | 10.0 | 4.3 | 30.0 |
| 13C2 PFDA | Ave | 0.7652 | 0.7191 | | 9.40 | 10.0 | -6.0 | 30.0 |

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Lab Sample ID: CCV 320-200767/13 Calibration Date: 12/19/2017 21:27
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.19_537A_062.d Conc. Units: ng/mL

| ANALYTE | CURVE TYPE | AVE RRF | RRF | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D | MAX %D |
|--------------------------------------|------------|---------|--------|---------|-------------|--------------|------|--------|
| Perfluorobutanesulfonic acid (PFBS) | QuaF | | 1.111 | | 47.7 | 45.0 | 6.0 | 30.0 |
| Perfluoroheptanoic acid (PFHpA) | Ave | 0.9369 | 0.9480 | | 5.06 | 5.00 | 1.2 | 30.0 |
| Perfluorohexanesulfonic acid (PFHxS) | Ave | 1.674 | 1.748 | | 15.7 | 15.0 | 4.4 | 30.0 |
| Perfluorooctanoic acid (PFOA) | Ave | 0.9258 | 0.8955 | | 9.68 | 10.0 | -3.3 | 30.0 |
| Perfluorooctanesulfonic acid (PFOS) | Ave | 0.9389 | 0.9133 | | 19.5 | 20.0 | -2.7 | 30.0 |
| Perfluorononanoic acid (PFNA) | Ave | 0.6642 | 0.6453 | | 9.72 | 10.0 | -2.8 | 30.0 |
| 13C2 PFHxA | Ave | 1.100 | 1.148 | | 10.4 | 10.0 | 4.3 | 30.0 |
| 13C2 PFDA | Ave | 0.7652 | 0.7191 | | 9.40 | 10.0 | -6.0 | 30.0 |

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1
 SDG No.: _____
 Lab Sample ID: CCV 320-200767/21 Calibration Date: 12/19/2017 22:04
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.19_537A_070.d Conc. Units: ng/mL

| ANALYTE | CURVE TYPE | AVE RRF | RRF | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D | MAX %D |
|--------------------------------------|------------|---------|--------|---------|-------------|--------------|------|--------|
| Perfluorobutanesulfonic acid (PFBS) | QuaF | | 0.9658 | | 144 | 135 | 7.0 | 30.0 |
| Perfluoroheptanoic acid (PFHpA) | Ave | 0.9369 | 0.9586 | | 15.4 | 15.0 | 2.3 | 30.0 |
| Perfluorohexanesulfonic acid (PFHxS) | Ave | 1.674 | 1.786 | | 48.0 | 45.0 | 6.7 | 30.0 |
| Perfluorooctanoic acid (PFOA) | Ave | 0.9258 | 0.9363 | | 30.4 | 30.0 | 1.1 | 30.0 |
| Perfluorooctanesulfonic acid (PFOS) | Ave | 0.9389 | 0.9746 | | 62.3 | 60.0 | 3.8 | 30.0 |
| Perfluorononanoic acid (PFNA) | Ave | 0.6642 | 0.6549 | | 29.6 | 30.0 | -1.4 | 30.0 |
| 13C2 PFHxA | Ave | 1.100 | 1.154 | | 10.5 | 10.0 | 4.9 | 30.0 |
| 13C2 PFDA | Ave | 0.7652 | 0.7632 | | 9.97 | 10.0 | -0.3 | 30.0 |

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1

SDG No.: _____

Instrument ID: A8_N Start Date: 11/03/2017 13:37

Analysis Batch Number: 192908 End Date: 11/03/2017 14:24

| LAB SAMPLE ID | CLIENT SAMPLE ID | DATE ANALYZED | DILUTION FACTOR | LAB FILE ID | COLUMN ID |
|---------------------------|------------------|------------------|-----------------|-------------------------------|-----------------------|
| IC 320-192908/4 | | 11/03/2017 13:37 | 1 | 2017.11.03_537X ICAL 004.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/5 | | 11/03/2017 13:42 | 1 | 2017.11.03_537X ICAL 005.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/6 | | 11/03/2017 13:47 | 1 | 2017.11.03_537X ICAL 006.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/7 ICISAV | | 11/03/2017 13:52 | 1 | 2017.11.03_537X ICAL 007.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/8 | | 11/03/2017 13:56 | 1 | 2017.11.03_537X ICAL 008.d | GeminiC18 3x100 3(mm) |
| IC 320-192908/9 | | 11/03/2017 14:01 | 1 | 2017.11.03_537X ICAL 009.d | GeminiC18 3x100 3(mm) |
| ZZZZZ | | 11/03/2017 14:06 | 1 | | GeminiC18 3x100 3(mm) |
| CCVL 320-192908/11 | | 11/03/2017 14:10 | 1 | 2017.11.03_537X ICAL 011.d | GeminiC18 3x100 3(mm) |
| ZZZZZ | | 11/03/2017 14:15 | 1 | | GeminiC18 3x100 3(mm) |
| ICV 320-192908/13 | | 11/03/2017 14:20 | 1 | 2017.11.03_537X ICAL 013.d | GeminiC18 3x100 3(mm) |
| ZZZZZ | | 11/03/2017 14:24 | 1 | | GeminiC18 3x100 3(mm) |

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/18/2017 09:53

Analysis Batch Number: 200292 End Date: 12/18/2017 10:31

| LAB SAMPLE ID | CLIENT SAMPLE ID | DATE ANALYZED | DILUTION FACTOR | LAB FILE ID | COLUMN ID |
|---------------------------|------------------|------------------|-----------------|--------------------------|-----------------------|
| CCVL 320-200292/1 | | 12/18/2017 09:53 | 1 | 2017.12.18_537A 004.d | GeminiC18 3x100 3(mm) |
| CCV 320-200292/2 CCVIS | | 12/18/2017 09:58 | 1 | | GeminiC18 3x100 3(mm) |
| CCV 320-200292/9 CCVIS | | 12/18/2017 10:31 | 1 | | GeminiC18 3x100 3(mm) |

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/19/2017 20:31

Analysis Batch Number: 200646 End Date: 12/19/2017 21:27

| LAB SAMPLE ID | CLIENT SAMPLE ID | DATE ANALYZED | DILUTION FACTOR | LAB FILE ID | COLUMN ID |
|----------------------------|------------------|------------------|-----------------|--------------------------|-----------------------|
| CCV 320-200646/1 CCVIS | | 12/19/2017 20:31 | 1 | 2017.12.19_537A 050.d | GeminiC18 3x100 3(mm) |
| MB 320-199900/1-A | | 12/19/2017 20:40 | 1 | 2017.12.19_537A 052.d | GeminiC18 3x100 3(mm) |
| LCS 320-199900/2-A | | 12/19/2017 20:45 | 1 | 2017.12.19_537A 053.d | GeminiC18 3x100 3(mm) |
| LCSD 320-199900/3-A | | 12/19/2017 20:49 | 1 | 2017.12.19_537A 054.d | GeminiC18 3x100 3(mm) |
| 320-34181-1 | | 12/19/2017 20:54 | 1 | 2017.12.19_537A 055.d | GeminiC18 3x100 3(mm) |
| 320-34181-2 | | 12/19/2017 20:59 | 1 | 2017.12.19_537A 056.d | GeminiC18 3x100 3(mm) |
| 320-34181-3 | | 12/19/2017 21:03 | 1 | 2017.12.19_537A 057.d | GeminiC18 3x100 3(mm) |
| 320-34181-4 | | 12/19/2017 21:08 | 1 | 2017.12.19_537A 058.d | GeminiC18 3x100 3(mm) |
| 320-34181-5 | | 12/19/2017 21:13 | 1 | 2017.12.19_537A 059.d | GeminiC18 3x100 3(mm) |
| 320-34181-6 | | 12/19/2017 21:17 | 1 | 2017.12.19_537A 060.d | GeminiC18 3x100 3(mm) |
| 320-34181-7 | | 12/19/2017 21:22 | 1 | 2017.12.19_537A 061.d | GeminiC18 3x100 3(mm) |
| CCV 320-200646/13 CCVIS | | 12/19/2017 21:27 | 1 | 2017.12.19_537A 062.d | GeminiC18 3x100 3(mm) |

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/19/2017 21:27

Analysis Batch Number: 200767 End Date: 12/19/2017 22:04

| LAB SAMPLE ID | CLIENT SAMPLE ID | DATE ANALYZED | DILUTION FACTOR | LAB FILE ID | COLUMN ID |
|----------------------------|------------------|------------------|-----------------|--------------------------|-----------------------|
| CCV 320-200767/13 CCVIS | | 12/19/2017 21:27 | 1 | 2017.12.19_537A 062.d | GeminiC18 3x100 3(mm) |
| 320-34181-8 | | 12/19/2017 21:36 | 1 | 2017.12.19_537A 064.d | GeminiC18 3x100 3(mm) |
| 320-34181-9 | | 12/19/2017 21:41 | 1 | 2017.12.19_537A 065.d | GeminiC18 3x100 3(mm) |
| ZZZZZ | | 12/19/2017 21:46 | 1 | | GeminiC18 3x100 3(mm) |
| ZZZZZ | | 12/19/2017 21:50 | 1 | | GeminiC18 3x100 3(mm) |
| ZZZZZ | | 12/19/2017 21:55 | 1 | | GeminiC18 3x100 3(mm) |
| ZZZZZ | | 12/19/2017 22:00 | 1 | | GeminiC18 3x100 3(mm) |
| CCV 320-200767/21 CCVIS | | 12/19/2017 22:04 | 1 | 2017.12.19_537A 070.d | GeminiC18 3x100 3(mm) |

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34181-1

SDG No.: _____

Batch Number: 199900 Batch Start Date: 12/14/17 12:48 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 12/18/17 15:10

| Lab Sample ID | Client Sample ID | Method Chain | Basis | GrossWeight | TareWeight | InitialAmount | FinalAmount | ReceivedpH | LC537-HSP 00023 |
|-------------------|----------------------|--------------|-------|-------------|------------|---------------|-------------|------------|-----------------|
| MB 320-199900/1 | | 537, 537 | | | | 250.00 mL | 1.00 mL | 7 SU | |
| LCS 320-199900/2 | | 537, 537 | | | | 250.00 mL | 1.00 mL | 7 SU | 100 uL |
| LCSD 320-199900/3 | | 537, 537 | | | | 250.00 mL | 1.00 mL | 7 SU | 100 uL |
| 320-34181-A-1 | WGNA-121117-RW-0488 | 537, 537 | T | 255.67 g | 27.09 g | 228.6 mL | 1.00 mL | 7 SU | |
| 320-34181-A-2 | WGNA-121117-FRB-0488 | 537, 537 | T | 280.58 g | 27.03 g | 253.6 mL | 1.00 mL | 7 SU | |
| 320-34181-A-3 | NAWC-121117-RW-136 | 537, 537 | T | 273.58 g | 27.55 g | 246 mL | 1.00 mL | 7 SU | |
| 320-34181-A-4 | NAWC-121117-FRB-136 | 537, 537 | T | 275.68 g | 26.94 g | 248.7 mL | 1.00 mL | 7 SU | |
| 320-34181-A-5 | NAWC-121117-RW-040 | 537, 537 | T | 275.87 g | 27.47 g | 248.4 mL | 1.00 mL | 7 SU | |
| 320-34181-A-6 | NAWC-121117-FRB-040 | 537, 537 | T | 274.29 g | 26.91 g | 247.4 mL | 1.00 mL | 7 SU | |
| 320-34181-A-7 | WGNA-121117-RW-4846 | 537, 537 | T | 274.34 g | 27.57 g | 246.8 mL | 1.00 mL | 7 SU | |
| 320-34181-A-8 | WGNA-121117-FRB-4846 | 537, 537 | T | 277.49 g | 27.17 g | 250.3 mL | 1.00 mL | 7 SU | |
| 320-34181-A-9 | WGNA-121117-DUP14 | 537, 537 | T | 272.99 g | 27.17 g | 245.8 mL | 1.00 mL | 7 SU | |

| Lab Sample ID | Client Sample ID | Method Chain | Basis | LC537-IS 00054 | LC537-SU 00056 | AnalysisComment | | | |
|-------------------|----------------------|--------------|-------|----------------|----------------|-----------------|--|--|--|
| MB 320-199900/1 | | 537, 537 | | 100 uL | 100 uL | C1 ND | | | |
| LCS 320-199900/2 | | 537, 537 | | 100 uL | 100 uL | C1 ND | | | |
| LCSD 320-199900/3 | | 537, 537 | | 100 uL | 100 uL | C1 ND | | | |
| 320-34181-A-1 | WGNA-121117-RW-0488 | 537, 537 | T | 100 uL | 100 uL | C1 ND | | | |
| 320-34181-A-2 | WGNA-121117-FRB-0488 | 537, 537 | T | 100 uL | 100 uL | C1 ND | | | |
| 320-34181-A-3 | NAWC-121117-RW-136 | 537, 537 | T | 100 uL | 100 uL | C1 ND | | | |
| 320-34181-A-4 | NAWC-121117-FRB-136 | 537, 537 | T | 100 uL | 100 uL | C1 ND | | | |
| 320-34181-A-5 | NAWC-121117-RW-040 | 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.: 320-34181-1

SDG No.: _____

Batch Number: 199900 Batch Start Date: 12/14/17 12:48 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 12/18/17 15:10

| Lab Sample ID | Client Sample ID | Method Chain | Basis | LC537-IS 00054 | LC537-SU 00056 | AnalysisComment | | | |
|---------------|----------------------|--------------|-------|----------------|----------------|-----------------|--|--|--|
| 320-34181-A-6 | NAWC-121117-FRB-040 | 537, 537 | T | 100 uL | 100 uL | C1 ND | | | |
| 320-34181-A-7 | WGNA-121117-RW-4846 | 537, 537 | T | 100 uL | 100 uL | C1 ND | | | |
| 320-34181-A-8 | WGNA-121117-FRB-4846 | 537, 537 | T | 100 uL | 100 uL | C1 ND | | | |
| 320-34181-A-9 | WGNA-121117-DUP14 | 537, 537 | T | 100 uL | 100 uL | C1 ND | | | |

| Batch Notes | |
|--------------------------------------|--------------------|
| Analyst ID - Aliquot Step | CCB |
| Analyst ID - Concentration | CCB/KMK |
| Analyst ID - Final Volume Step | CCB |
| Internal Standard ID# | 1099354 |
| Manifold ID | 1,3 |
| Methanol ID | 1105466 |
| pH Indicator ID | 4390-01 (Lot 2517) |
| Pipette ID | M16387D |
| Analyst ID - IS Reagent Drop | CCB |
| Analyst ID - IS Reagent Drop Witness | HJA |
| Analyst ID - SU Reagent Drop | JER |
| Analyst ID - SU Reagent Drop Witness | KMK |
| Analyst ID - TA Reagent Drop | JER |
| Analyst ID - TA Reagent Drop Witness | KMK |
| SPE Cartridge ID | 6357081-11 |
| Trizma ID | SLBR4303V |
| Reagent Water ID | 12-12-17 |

| 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

19 A8 12/19/17











(To Accompany Samples to Instruments)

Batch Number: 320-199900
Method Code: 320-537_Prep-320

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM
Batch End: 12/18/2017 3:10:00PM

Extraction of Perfluorinated Alkyl Acids

| Input Sample Lab ID (Analytical Method) | SDG (Job #) | GrossWt TareWt | InitAmnt FinAmnt | Rcvd | PHs Adj1 Adj2 | Due Date | Analytical TAT | Div Rank | Comments | Output Sample Lab ID |
|--|----------------------|-------------------|---------------------|------|------------------|----------|-------------------|-------------|----------|---|
| 1 MB~320-199900/1 N/A | N/A | | 250.00 mL | 7 | | N/A | N/A | N/A | CI ND |  |
| | | | 1.00 mL | | | | | | | |
| 2 LCS~320-199900/2 N/A | N/A | | 250.00 mL | 7 | | N/A | N/A | N/A | CI ND |  |
| | | | 1.00 mL | | | | | | | |
| 3 LCSD~320-199900/3 N/A | N/A | | 250.00 mL | 7 | | N/A | N/A | N/A | CI ND |  |
| | | | 1.00 mL | | | | | | | |
| 4 320-34181-A-1 (537_DOD5) | N/A (320-34181-1) | 255.67 g | 228.6 mL | 7 | | 12/16/17 | 16_Days | 4 | CI ND |  |
| | | 27.09 g | 1.00 mL | | | | | | | |
| 5 320-34181-A-2 (537_DOD5) | N/A (320-34181-1) | 280.58 g | 253.6 mL | 7 | | 12/16/17 | 16_Days | 4 | CI ND |  |
| | | 27.03 g | 1.00 mL | | | | | | | |
| 6 320-34181-A-3 (537_DOD5) | N/A (320-34181-1) | 273.58 g | 246 mL | 7 | | 12/16/17 | 16_Days | 4 | CI ND |  |
| | | 27.55 g | 1.00 mL | | | | | | | |
| 7 320-34181-A-4 (537_DOD5) | N/A (320-34181-1) | 275.68 g | 248.7 mL | 7 | | 12/16/17 | 16_Days | 4 | CI ND |  |
| | | 26.94 g | 1.00 mL | | | | | | | |
| 8 320-34181-A-5 (537_DOD5) | N/A (320-34181-1) | 275.87 g | 248.4 mL | 7 | | 12/16/17 | 16_Days | 4 | CI ND |  |
| | | 27.47 g | 1.00 mL | | | | | | | |
| 9 320-34181-A-6 (537_DOD5) | N/A (320-34181-1) | 274.29 g | 247.4 mL | 7 | | 12/16/17 | 16_Days | 4 | CI ND |  |
| | | 26.91 g | 1.00 mL | | | | | | | |
| 10 320-34181-A-7 (537_DOD5) | N/A (320-34181-1) | 274.34 g | 246.8 mL | 7 | | 12/16/17 | 16_Days | 4 | CI ND |  |
| | | 27.57 g | 1.00 mL | | | | | | | |

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)







Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End: 12/18/2017 3:10:00PM

| | | | | | | | | | | | | |
|----|-----------------------------|----------------------|----------|----------|---|--|--|----------|---------|---|-------|--|
| 11 | 320-34181-A-8 (537_DOD5) | N/A (320-34181-1) | 277.49 g | 250.3 mL | 7 | | | 12/16/17 | 16_Days | 4 | CI ND |  3 2 0 - 3 4 1 8 1 - A - 8 - A |
| | | | 27.17 g | 1.00 mL | | | | | | | | |
| 12 | 320-34181-A-9 (537_DOD5) | N/A (320-34181-1) | 272.99 g | 245.8 mL | 7 | | | 12/16/17 | 16_Days | 4 | CI ND |  3 2 0 - 3 4 1 8 1 - A - 9 - A |
| | | | 27.17 g | 1.00 mL | | | | | | | | |
| 13 | 320-34235-A-1 (537_DOD5) | N/A (320-34235-1) | 273.57 g | 246.6 mL | 7 | | | 12/17/17 | 16_Days | 4 | CI ND |  3 2 0 - 3 4 2 3 5 - A - 1 - A |
| | | | 27.01 g | 1.00 mL | | | | | | | | |
| 14 | 320-34235-A-2 (537_DOD5) | N/A (320-34235-1) | 276.41 g | 249.5 mL | 7 | | | 12/17/17 | 16_Days | 4 | CI ND |  3 2 0 - 3 4 2 3 5 - A - 2 - A |
| | | | 26.87 g | 1.00 mL | | | | | | | | |
| 15 | 320-34235-A-3 (537_DOD5) | N/A (320-34235-1) | 274.48 g | 246.9 mL | 7 | | | 12/17/17 | 16_Days | 4 | CI ND |  3 2 0 - 3 4 2 3 5 - A - 3 - A |
| | | | 27.57 g | 1.00 mL | | | | | | | | |
| 16 | 320-34235-A-4 (537_DOD5) | N/A (320-34235-1) | 249.49 g | 222.6 mL | 7 | | | 12/17/17 | 16_Days | 4 | CI ND |  3 2 0 - 3 4 2 3 5 - A - 4 - A |
| | | | 26.86 g | 1.00 mL | | | | | | | | |

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End: 12/18/2017 3:10:00PM

Batch Notes

Manifold ID 1,3

pH Indicator ID 4390-01 (Lot 2517)

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-11

Methanol ID 1105466

Reagent Water ID 12-12-17

Internal Standard ID# 1099354

Pipette ID M16387D

Analyst ID - TA Reagent Drop JER

Analyst ID - TA Reagent Drop Witness KMK

Analyst ID - SU Reagent Drop JER

Analyst ID - SU Reagent Drop Witness KMK

Analyst ID - IS Reagent Drop CCB

Analyst ID - IS Reagent Drop Witness HJA

Analyst ID - Concentration CCB/KMK

Analyst ID - Aliquot Step CCB

Analyst ID - Final Volume Step CCB

Batch Comment N/A

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End:

Batch Notes

Manifold ID 1, 3

pH Indicator ID 4390-01 (Lot 2517)

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-11

Methanol ID 1105466

Reagent Water ID 12-12-17

Internal Standard ID# 1899354

Pipette ID M16387D

Analyst ID - TA Reagent Drop JER

Analyst ID - TA Reagent Drop Witness KMK

Analyst ID - SU Reagent Drop JER

Analyst ID - SU Reagent Drop Witness KMK

Analyst ID - IS Reagent Drop ceS

Analyst ID - IS Reagent Drop Witness 41QA

Analyst ID - Concentration nights

Analyst ID - Aliquot Step ceS

Analyst ID - Final Volume Step ceS

Batch Comment N/A

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End:

Reagent Additions Worksheet

| Lab ID | Reagent Code | Amount Added | Final Amount | By | Witness |
|-------------------|-----------------|--------------|--------------|---------------------|--------------|
| MB 320-199900/1 | LC537-SU_00056 | 100 uL | 1.00 mL | <i>KMK 12/14/17</i> | KMK 12-14-17 |
| LCS 320-199900/2 | LC537-HSP_00023 | 100 uL | 1.00 mL | | |
| LCS 320-199900/2 | LC537-SU_00056 | 100 uL | 1.00 mL | ↓ | ↓ |
| LCSD 320-199900/3 | LC537-HSP_00023 | 100 uL | 1.00 mL | | |
| LCSD 320-199900/3 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-1 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-2 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-3 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-4 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-5 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-6 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-7 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-8 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34181-A-9 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34235-A-1 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34235-A-2 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34235-A-3 | LC537-SU_00056 | 100 uL | 1.00 mL | | |
| 320-34235-A-4 | LC537-SU_00056 | 100 uL | 1.00 mL | | |

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PFAS Calibration Calculations:

Initial Calibration 11/3/2017
 Instrument A8_N

Perfluorohexanesulfonic acid

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

Continuing Calibration 12/19/2017 @ 20:31

Perfluorohexanesulfonic acid

| Analyte Concentration | Analyte Response | Internal Standard Response | Internal Standard Amount | RRF | %D | Reported RRF | Reported %D |
|-----------------------|------------------|----------------------------|--------------------------|--------|-----------|--------------|-------------|
| 45 | 8711333 | 3096651 | 28.7 | 1.7942 | 7.1717543 | 1.793 | 7.1 |

Willow Grove
SDG 320-34181-1

Sample Identification NAWC-121117-RW-040

Compound Perfluorohexanesulfonic acid

Compound Area 355347

Internal Standard Amount (ng) 28.7

Dilution Factor 1

Internal Standard Area 3369191

Average RRF 1.6741

Sample Volume(ml) 248.4

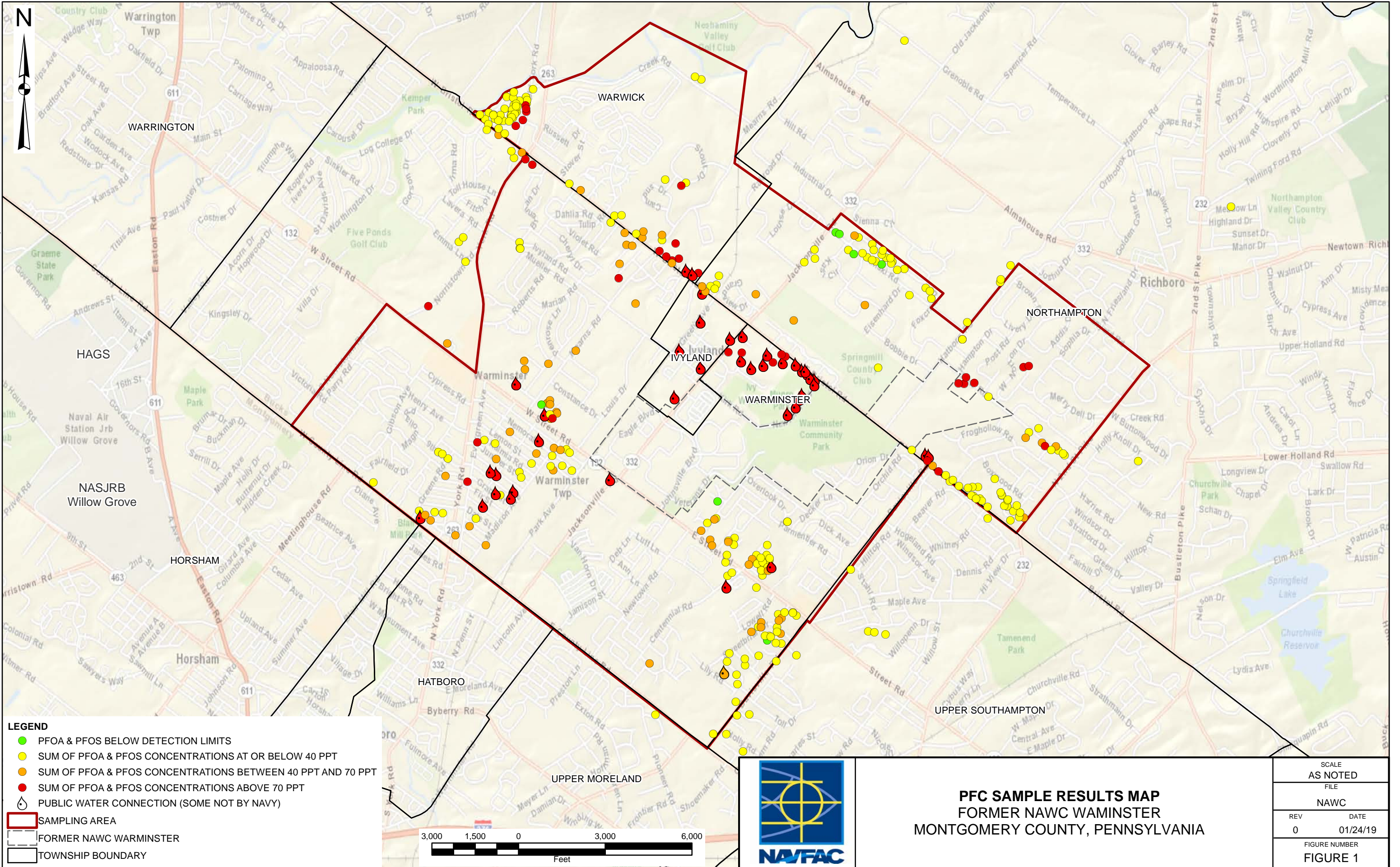
Volume Extract (ml) 1

Injection Volume (µl) 1

Concentration 0.0073 ug/L

7.28 ng/L

C:\AI\Projects\112008005\WE04\F.S.DR.03\NAWC_201901.mxd MKB 1/24/2019



LEGEND

- PFOA & PFOS BELOW DETECTION LIMITS
- SUM OF PFOA & PFOS CONCENTRATIONS AT OR BELOW 40 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS BETWEEN 40 PPT AND 70 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS ABOVE 70 PPT
- 👉 PUBLIC WATER CONNECTION (SOME NOT BY NAVY)
- SAMPLING AREA
- FORMER NAWC WARRINSTER
- TOWNSHIP BOUNDARY



PFC SAMPLE RESULTS MAP
 FORMER NAWC WARRINSTER
 MONTGOMERY COUNTY, PENNSYLVANIA

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