

## ANALYTICAL REPORT

Job Number: 280-94356-1

Job Description: ADEM PFC Sampling - Gadsden

For:

Alabama Dept. Environmental Management

2715 Sandlin Road, SW

Decatur, AL 35603

Attention: Mr. Ed Poolos



Approved for release.  
Stephanie K Rothmeyer  
Project Manager I  
3/16/2017 9:34 AM

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03/16/2017

The test results in this report relate only to the samples in this report and meet all requirements of NELAC, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is 4025.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

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## Definitions/Glossary

Client: Alabama Dept. Environmental Management  
Project/Site: ADEM PFC Sampling - Gadsden

TestAmerica Job ID: 280-94356-1

### Qualifiers

#### LCMS

| Qualifier | Qualifier Description  |
|-----------|--|
| J         | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| U         | Indicates the analyte was analyzed for but not detected.   |

### 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, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC            | Decision level concentration  |
| MDA            | Minimum detectable activity   |
| EDL            | Estimated Detection Limit   |
| MDC            | Minimum detectable concentration  |
| 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  |
| 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)   |

## CASE NARRATIVE

Client: Alabama Dept. Environmental Management

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With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

### **RECEIPT**

The samples were received on 3/2/2017 at 8:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.6° C.

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): GADSDEN-RAW (280-94356-2). The container labels list Sample ID RW, while the COC lists GADSDEN-RAW (280-94356-2). The sample was logged per the COC.

### **PERFLUORINATED HYDROCARBONS (PFC)**

Samples GADSDEN-RAW (280-94356-2) and GADSDEN-FINISHED (280-94356-3) were analyzed for Perfluorinated Hydrocarbons (PFC) in accordance with SOP DV-LC-0012. The samples were prepared on 03/05/2017 and analyzed on 03/06/2017.

During the solid phase extraction process, the following sample clogged the cartridge: GADSDEN-RAW (280-94356-2). Therefore, the IS volume was adjusted to match the volume of sample extracted. As such, reporting limits (RLs) are not impacted.

The following sample was decanted prior to preparation: GADSDEN-RAW (280-94356-2).

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

### **PERFLUOROOCANE SULFONAMIDE (FOSA)**

Samples GADSDEN-RAW (280-94356-2) and GADSDEN-FINISHED (280-94356-3) were analyzed for Perfluorooctane Sulfonamide (FOSA) in accordance with SOP DV-LC-0012. The samples were prepared on 03/09/2017 and analyzed on 03/14/2017.

Internal standard responses were outside of acceptance limits for the following samples: GADSDEN-RAW (280-94356-2), GADSDEN-FINISHED (280-94356-3). The samples show evidence of matrix interference.

The following sample was decanted prior to preparation: GADSDEN-RAW (280-94356-2).

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

## Client Sample Results

Client: Alabama Dept. Environmental Management  
Project/Site: ADEM PFC Sampling - Gadsden

TestAmerica Job ID: 280-94356-1

**Client Sample ID: GADSDEN-RAW**

**Lab Sample ID: 280-94356-2**

Date Collected: 02/28/17 20:00

Matrix: Water

Date Received: 03/02/17 08:45

**Method: DV-LC-0012 - Perfluorinated Hydrocarbons**

| Analyte                             | Result           | Qualifier        | RL            | MDL    | Unit | D | Prepared        | Analyzed        | Dil Fac        |
|-------------------------------------|------------------|------------------|---------------|--------|------|---|-----------------|-----------------|----------------|
| Perfluorobutane Sulfonate (PFBS)    | 0.066            |                  | 0.018         | 0.0075 | ug/L |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |
| Perfluorobutanoic acid (PFBA)       | 0.014            | J                | 0.018         | 0.0090 | ug/L |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |
| Perfluorodecane sulfonate (PFDS)    | 0.0084           | U                | 0.018         | 0.0084 | ug/L |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |
| Perfluorodecanoic acid (PFDA)       | 0.0072           | U                | 0.018         | 0.0072 | ug/L |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |
| Perfluorododecanoic acid (PFDoA)    | 0.014            | U                | 0.027         | 0.014  | ug/L |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |
| Perfluoroheptanoic acid (PFHpA)     | 0.017            | J                | 0.027         | 0.012  | ug/L |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |
| Perfluorohexane Sulfonate (PFHxS)   | 0.0064           | U                | 0.027         | 0.0064 | ug/L |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |
| Perfluorohexanoic acid (PFHxA)      | 0.036            |                  | 0.018         | 0.0027 | ug/L |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |
| Perfluorononanoic acid (PFNA)       | 0.016            | U                | 0.037         | 0.016  | ug/L |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |
| Perfluorooctanoic acid (PFOA)       | 0.023            |                  | 0.018         | 0.0090 | ug/L |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |
| Perfluorooctane Sulfonate (PFOS)    | 0.026            | J                | 0.027         | 0.012  | ug/L |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |
| Perfluoropentanoic acid (PFPA)      | 0.048            |                  | 0.027         | 0.010  | ug/L |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |
| Perfluorotetradecanoic acid (PFTeA) | 0.013            | U                | 0.027         | 0.013  | ug/L |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |
| Perfluorotridecanoic Acid (PFTriA)  | 0.016            | U                | 0.037         | 0.016  | ug/L |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |
| Perfluoroundecanoic acid (PFUnA)    | 0.0063           | U                | 0.018         | 0.0063 | ug/L |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |
| <b>Surrogate</b>                    | <b>%Recovery</b> | <b>Qualifier</b> | <b>Limits</b> |        |      |   | <b>Prepared</b> | <b>Analyzed</b> | <b>Dil Fac</b> |
| 13C8 PFOA                           | 111              |                  | 60 - 155      |        |      |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |
| 13C8 PFOS                           | 103              |                  | 45 - 130      |        |      |   | 03/05/17 11:43  | 03/06/17 13:42  | 1              |

**Method: PFC -FOSA - FOSA in Water (LC/MS/MS)**

| Analyte                            | Result | Qualifier | RL    | MDL    | Unit | D | Prepared       | Analyzed       | Dil Fac |
|------------------------------------|--------|-----------|-------|--------|------|---|----------------|----------------|---------|
| Perfluorooctane Sulfonamide (FOSA) | 0.0067 | U         | 0.058 | 0.0067 | ug/L |   | 03/09/17 13:07 | 03/14/17 13:53 | 1       |

**Client Sample ID: GADSDEN-FINISHED**

**Lab Sample ID: 280-94356-3**

Date Collected: 03/01/17 10:00

Matrix: Water

Date Received: 03/02/17 08:45

**Method: DV-LC-0012 - Perfluorinated Hydrocarbons**

| Analyte                             | Result           | Qualifier        | RL            | MDL    | Unit | D | Prepared        | Analyzed        | Dil Fac        |
|-------------------------------------|------------------|------------------|---------------|--------|------|---|-----------------|-----------------|----------------|
| Perfluorobutane Sulfonate (PFBS)    | 0.075            |                  | 0.019         | 0.0080 | ug/L |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |
| Perfluorobutanoic acid (PFBA)       | 0.014            | J                | 0.019         | 0.0095 | ug/L |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |
| Perfluorodecane sulfonate (PFDS)    | 0.0089           | U                | 0.019         | 0.0089 | ug/L |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |
| Perfluorodecanoic acid (PFDA)       | 0.0076           | U                | 0.019         | 0.0076 | ug/L |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |
| Perfluorododecanoic acid (PFDoA)    | 0.014            | U                | 0.029         | 0.014  | ug/L |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |
| Perfluoroheptanoic acid (PFHpA)     | 0.016            | J                | 0.029         | 0.013  | ug/L |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |
| Perfluorohexane Sulfonate (PFHxS)   | 0.0068           | U                | 0.029         | 0.0068 | ug/L |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |
| Perfluorohexanoic acid (PFHxA)      | 0.038            |                  | 0.019         | 0.0028 | ug/L |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |
| Perfluorononanoic acid (PFNA)       | 0.017            | U                | 0.039         | 0.017  | ug/L |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |
| Perfluorooctanoic acid (PFOA)       | 0.025            |                  | 0.019         | 0.0095 | ug/L |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |
| Perfluorooctane Sulfonate (PFOS)    | 0.034            |                  | 0.029         | 0.013  | ug/L |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |
| Perfluoropentanoic acid (PFPA)      | 0.047            |                  | 0.029         | 0.011  | ug/L |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |
| Perfluorotetradecanoic acid (PFTeA) | 0.014            | U                | 0.029         | 0.014  | ug/L |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |
| Perfluorotridecanoic Acid (PFTriA)  | 0.017            | U                | 0.039         | 0.017  | ug/L |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |
| Perfluoroundecanoic acid (PFUnA)    | 0.0067           | U                | 0.019         | 0.0067 | ug/L |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |
| <b>Surrogate</b>                    | <b>%Recovery</b> | <b>Qualifier</b> | <b>Limits</b> |        |      |   | <b>Prepared</b> | <b>Analyzed</b> | <b>Dil Fac</b> |
| 13C8 PFOA                           | 108              |                  | 60 - 155      |        |      |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |
| 13C8 PFOS                           | 107              |                  | 45 - 130      |        |      |   | 03/05/17 11:43  | 03/06/17 13:54  | 1              |

TestAmerica Denver

# Client Sample Results

Client: Alabama Dept. Environmental Management  
Project/Site: ADEM PFC Sampling - Gadsden

TestAmerica Job ID: 280-94356-1

**Client Sample ID: GADSDEN-FINISHED**

**Lab Sample ID: 280-94356-3**

Date Collected: 03/01/17 10:00

Matrix: Water

Date Received: 03/02/17 08:45

Method: PFC -FOSA - FOSA in Water (LC/MS/MS)

| Analyte                            | Result | Qualifier | RL    | MDL    | Unit | D | Prepared       | Analyzed       | Dil Fac |
|------------------------------------|--------|-----------|-------|--------|------|---|----------------|----------------|---------|
| Perfluorooctane Sulfonamide (FOSA) | 0.0053 | U         | 0.046 | 0.0053 | ug/L |   | 03/09/17 13:07 | 03/14/17 14:05 | 1       |