



Tetra Tech INC

INTERNAL CORRESPONDENCE

TO: J. FORRELLI **DATE:** JULY 11, 2013
FROM: JOSEPH KALINYAK **COPIES:** DV FILE
SUBJECT: ORGANIC DATA VALIDATION – PFOA / PFOS
NAS BRUNSWICK, CTO 432
SAMPLE DELIVERY GROUP (SDG) – 280-42839-1

SAMPLES: 14 / Aqueous / PFOA / PFOS

- | | |
|---------------------------|-------------------------|
| NASB-EP-EF-0513 | NASB-EP-GW-DUP03-052913 |
| NASB-EP-GW-DUP04-052913 | NASB-EP-GW-EW05B-0513 |
| NASB-EP-GW-MGBR-MW04-0513 | NASB-EP-GW-MW1104-0513 |
| NASB-EP-GW-MW323-0513 | NASB-EP-GW-MW334-0513 |
| NASB-EP-GW-MW335-0513 | NASB-EP-GW-MWEP347-0513 |
| NASB-EP-GW-MWEP351-0513 | NASB-EP-GW-MWEP352-0513 |
| NASB-EP-GW-RB02-053013 | NASB-EP-IN-0513 |

OVERVIEW

The sample set for NAS Brunswick, CTO 432, SDG 280-42839-1 consisted of fourteen (14) aqueous samples including one (1) rinse blank sample. The samples were analyzed as listed above for pentadecafluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS). Two (2) field duplicate sample pairs were included in this sample delivery group (SDG): NASB-EP-GW-DUP03-052913 / NASB-EP-GW-MW1104-0513 and NASB-EP-GW-DUP04-052913 / NASB-EP-GW-MWEP347-0513.

The samples were collected by Tetra Tech on May 29 and 30, 2013 and analyzed by TestAmerica Laboratories, Inc. All analyses were conducted in accordance with a TestAmerica procedure DV-LC-0012, LCMS PFOA, analytical and reporting protocols. A Tier II validation was conducted on the referenced sample analyses. The data was evaluated based on the following parameters:

- * • Data Completeness
- * • Holding Times
- * • LC/MS Instrument Tuning and System Performance
- * • Initial and Continuing Calibration
- * • Blank Results
- * • Blank Spike/Blank Spike Duplicate Results
- * • Surrogate Spike Recoveries
- * • Internal Standard Recoveries
- * • Matrix Spike/Matrix Spike Duplicate Recoveries
- * • Field Duplicate Precision
- * • Compound Quantitation
- * • Detection Limits

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B. Appendix C contains Region I worksheets, and Appendix D contains the documentation to support the findings as discussed in this data validation report.

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SDG: 280-42839-1

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HOLD TIME

No issues were identified.

BLANKS

No issues were identified.

CALIBRATIONS

No issues were identified.

LABORATORY CONTROL SPIKE/LABORATORY CONTROL SPIKE DUPLICATE (LCS/LCSD)

No issues were identified.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE (MS/MSD)

No issues were identified.

INTERNAL STANDARDS

The recoveries for internal standard 13C4 PFOA were less than the quality control limit for samples as listed below.

Affected Samples:

NASB-EP-GW-EW05B-0513 NASB-EP-GW-MW323-0513
NASB-EP-GW-MWEP347-0513 NASB-EP-GW-DUP04-052913

Actions: No validation action was necessary as the samples were reported from the 10X sample dilution analyses for the analyte PFOA.

The recoveries for both internal standards 13C4 PFOA and 13C4 PFOS were less than the quality control limit for samples as listed below.

Affected Samples:

NASB-EP-GW-EW05B-0513 10X dilution re-analysis
NASB-EP-GW-MW323-0513 10X dilution re-analysis
NASB-EP-GW-MWEP347-0513 10X dilution re-analysis
NASB-EP-GW-DUP04-052913 10X dilution re-analysis

Actions: The samples were diluted (10X) after the addition of the internal standard resulting in lower internal standard recoveries for the sample analysis. A review of the area responses is consistent with a dilution factor of 10. Therefore, no validation action was necessary for this issue.

SURROGATE SPIKE RECOVERIES

No issues were identified.

COMPOUND QUANTIFICATION / FIELD DUPLICATE PRECISION

No issues were identified.

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ADDITIONAL COMMENTS

Positive results reported below the quantitation limit but above the method detection limit were qualified as estimated, (J).

Sample results were reported to the Limit of Detection (LOD).

The following samples were re-analyzed at a dilution for PFOA due to the analytes exceeding the highest calibration standard in the undiluted analysis. The PFOA results for the listed samples were reported from the dilution analyses. No validation action was required.

<u>Sample</u>	<u>Analyte</u>	<u>Dilution</u>
NASB-EP-GW-DUP04-052913	PFOA	10X
NASB-EP-GW-EW05B-0513	PFOA	10X
NASB-EP-GW-MW323-0513	PFOA	10X
NASB-EP-GW-MWEP347-0513	PFOA	10X

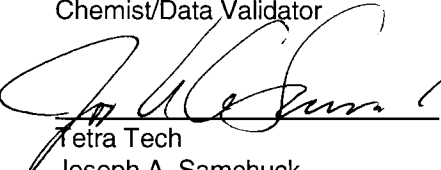
EXECUTIVE SUMMARY

Laboratory Performance: No issues were identified.

Other Factors Affecting Data Quality: Positive results reported below the limit of quantitation (LOQ) but above the method detection limit were qualified as estimated, (J).

The data for these analyses were reviewed with reference to the "USEPA National Functional Guidelines – June 2008, and the (DOD) QSM document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (October 2010).


Tetra Tech
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Tetra Tech
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Attachments:

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

APPENDIX A

QUALIFIED LABORATORY RESULTS

Value Qualifier Key (Val Qual)

J – The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

UJ – The result is an estimated non-detected quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

U - Value is a non-detect as reported by the laboratory.

UR – Non-detected result is considered rejected, (UR), as a result of technical non-compliances.

DATA QUALIFICATION CODE (QUAL CODE)

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 sigma deviation is less than sample activity
- Z1 = Tentatively Identified Compound considered presumptively present
- Z2 = Tentatively Identified Compound column bleed

PROJ_NO: 00958 SDG: 280-42839-1 FRACTION: MISC MEDIA: WATER	NSAMPLE	NASB-EP-EF-0513			NASB-EP-GW-DUP03-052913			NASB-EP-GW-DUP04-052913			NASB-EP-GW-EW05B-0513		
	LAB_ID	280-42839-2			280-42839-8			280-42839-13			280-42839-3		
	SAMP_DATE	5/29/2013			5/29/2013			5/29/2013			5/29/2013		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF				NASB-EP-GW-MW1104-0513			NASB-EP-GW-MWEP347-0513					
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
PENTADECAFLUOROOCANOIC ACID	0.98			0.6			10			9.1			
PERFLUOROOCANE SULFONIC ACID	0.05			0.019	J	P	0.096			0.65			

PROJ_NO: 00958 SDG: 280-42839-1 FRACTION: MISC MEDIA: WATER	NSAMPLE	NASB-EP-GW-MGBR-MW04-0513			NASB-EP-GW-MW1104-0513			NASB-EP-GW-MW323-0513			NASB-EP-GW-MW334-0513		
	LAB_ID	280-42839-5			280-42839-4			280-42839-6			280-42839-11		
	SAMP_DATE	5/29/2013			5/29/2013			5/29/2013			5/30/2013		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/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	
PENTADEC AFLUORO OCTANOIC ACID	0.26			0.59			7			0.35			
PERFLUORO OCTANE SULFONIC ACID	0.1			0.017	J	P	0.54			0.02	U		

PROJ_NO: 00958 SDG: 280-42839-1 FRACTION: MISC MEDIA: WATER	NSAMPLE	NASB-EP-GW-MW335-0513			NASB-EP-GW-MWEP347-0513			NASB-EP-GW-MWEP351-0513			NASB-EP-GW-MWEP352-0513		
	LAB_ID	280-42839-9			280-42839-7			280-42839-12			280-42839-10		
	SAMP_DATE	5/30/2013			5/29/2013			5/30/2013			5/30/2013		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/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	
PENTADECAFLUOROOCCTANOIC ACID	0.014	J	P	11			0.89			0.83			
PERFLUOROOCCTANE SULFONIC ACID	0.02	U		0.094			0.026	J	P	0.02	U		

PROJ_NO: 00958 SDG: 280-42839-1 FRACTION: MISC MEDIA: WATER	NSAMPLE	NASB-EP-GW-RB02-053013			NASB-EP-IN-0513		
	LAB_ID	280-42839-14			280-42839-1		
	SAMP_DATE	5/30/2013			5/29/2013		
	QC_TYPE	NM			NM		
	UNITS	UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
PENTADECAFLUOROOCANOIC ACID	0.008	U		1.4			
PERFLUOROOCANE SULFONIC ACID	0.02	U		0.42			

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-EF-0513 Lab Sample ID: 280-42839-2
 Matrix: Water Lab File ID: PC513F07017.d
 Analysis Method: PFOA/PFOS Date Collected: 05/29/2013 08:20
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 256.7(mL) Date Analyzed: 06/07/2013 12:29
 Con. Extract Vol.: 5(mL) Dilution Factor: 1
 Injection Volume: 20(uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.98		0.019	0.0078	0.0044
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.050		0.029	0.019	0.0095

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	125		60-155
STL01054	13C8 PFOS	115		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-GW-DUP03-052913 Lab Sample ID: 280-42839-8
 Matrix: Water Lab File ID: PC513F07023.d
 Analysis Method: PFOA/PFOS Date Collected: 05/29/2013 00:00
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 250.3 (mL) Date Analyzed: 06/07/2013 13:22
 Con. Extract Vol.: 5 (mL) Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.60		0.020	0.0080	0.0045
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.019	J	0.030	0.020	0.0098

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	121		60-155
STL01054	13C8 PFOS	117		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-GW-DUP04-052913 Lab Sample ID: 280-42839-13
 Matrix: Water Lab File ID: PC513F07031.d
 Analysis Method: PFOA/PFOS Date Collected: 05/29/2013 00:00
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 248 (mL) Date Analyzed: 06/07/2013 14:32
 Con. Extract Vol.: 5 (mL) Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.096		0.030	0.020	0.0099

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	125		60-155
STL01054	13C8 PFOS	117		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-GW-DUP04-052913 Lab Sample ID: 280-42839-13 DL **12X**
 Matrix: Water Lab File ID: PC513F07037.d
 Analysis Method: PFOA/PFOS Date Collected: 05/29/2013 00:00
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 248 (mL) Date Analyzed: 06/07/2013 15:24
 Con. Extract Vol.: 5 (mL) Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	10		0.020	0.0081	0.0045

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	121	D	60-155
STL01054	13C8 PFOS	119	D	45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-GW-EW05B-0513 Lab Sample ID: 280-42839-3
 Matrix: Water Lab File ID: PC513F07018.d
 Analysis Method: PFOA/PFOS Date Collected: 05/29/2013 08:40
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 258.1 (mL) Date Analyzed: 06/07/2013 12:38
 Con. Extract Vol.: 5 (mL) Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.65		0.029	0.019	0.0095

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	123		60-155
STL01054	13C8 PFOS	115		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-GW-EW05B-0513 DL Lab Sample ID: 280-42839-3 DL **10X**
 Matrix: Water Lab File ID: PC513F07033.d
 Analysis Method: PFOA/PFOS Date Collected: 05/29/2013 08:40
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 258.1 (mL) Date Analyzed: 06/07/2013 14:49
 Con. Extract Vol.: 5 (mL) Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	9.1		0.019	0.0077	0.0044

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	117	D	60-155
STL01054	13C8 PFOS	124	D	45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-GW-MGBR-MW04-0513 Lab Sample ID: 280-42839-5
 Matrix: Water Lab File ID: PC513F07020.d
 Analysis Method: PFOA/PFOS Date Collected: 05/29/2013 11:35
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 251.1(mL) Date Analyzed: 06/07/2013 12:56
 Con. Extract Vol.: 5(mL) Dilution Factor: 1
 Injection Volume: 20(uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.26		0.020	0.0080	0.0045
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.10		0.030	0.020	0.0098

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	124		60-155
STL01054	13C8 PFOS	113		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-GW-MW1104-0513 Lab Sample ID: 280-42839-4
 Matrix: Water Lab File ID: PC513F07019.d
 Analysis Method: PFOA/PFOS Date Collected: 05/29/2013 10:04
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 250.8(mL) Date Analyzed: 06/07/2013 12:47
 Con. Extract Vol.: 5(mL) Dilution Factor: 1
 Injection Volume: 20(uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.59		0.020	0.0080	0.0045
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.017	J	0.030	0.020	0.0098

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	122		60-155
STL01054	13C8 PFOS	113		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-GW-MW323-0513 Lab Sample ID: 280-42839-6
 Matrix: Water Lab File ID: PC513F07021.d
 Analysis Method: PFOA/PFOS Date Collected: 05/29/2013 15:30
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 257.6(mL) Date Analyzed: 06/07/2013 13:04
 Con. Extract Vol.: 5(mL) Dilution Factor: 1
 Injection Volume: 20(uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.54		0.029	0.019	0.0095

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	123		60-155
STL01054	13C8 PFOS	116		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-GW-MW323-0513 DL Lab Sample ID: 280-42839-6 DL 10X
 Matrix: Water Lab File ID: PC513F07034.d
 Analysis Method: PFOA/PFOS Date Collected: 05/29/2013 15:30
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 257.6(mL) Date Analyzed: 06/07/2013 14:58
 Con. Extract Vol.: 5(mL) Dilution Factor: 1
 Injection Volume: 20(uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	7.0		0.019	0.0078	0.0044

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	134	D	60-155
STL01054	13C8 PFOS	118	D	45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-GW-MW334-0513 Lab Sample ID: 280-42839-11
 Matrix: Water Lab File ID: PC513F07029.d
 Analysis Method: PFOA/PFOS Date Collected: 05/30/2013 12:05
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 250.1 (mL) Date Analyzed: 06/07/2013 14:14
 Con. Extract Vol.: 5 (mL) Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.35		0.020	0.0080	0.0045
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.020	U	0.030	0.020	0.0098

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	124		60-155
STL01054	13C8 PFOS	117		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-GW-MW335-0513 Lab Sample ID: 280-42839-9
 Matrix: Water Lab File ID: PC513F07025.d
 Analysis Method: PFOA/PFOS Date Collected: 05/30/2013 09:34
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 255.1 (mL) Date Analyzed: 06/07/2013 13:39
 Con. Extract Vol.: 5 (mL) Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.014	J	0.020	0.0078	0.0044
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.020	U	0.029	0.020	0.0096

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	123		60-155
STL01054	13C8 PFOS	116		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-GW-MWEP347-0513 Lab Sample ID: 280-42839-7
 Matrix: Water Lab File ID: PC513F07022.d
 Analysis Method: PFOA/PFOS Date Collected: 05/29/2013 15:35
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 246.6(mL) Date Analyzed: 06/07/2013 13:13
 Con. Extract Vol.: 5(mL) Dilution Factor: 1
 Injection Volume: 20(uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.094		0.030	0.020	0.0099

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	128		60-155
STL01054	13C8 PFOS	113		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-GW-MWEP347-0513 Lab Sample ID: 280-42839-7 DL 10X
 Matrix: Water Lab File ID: PC513F07036.d
 Analysis Method: PFOA/PFOS Date Collected: 05/29/2013 15:35
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 246.6(mL) Date Analyzed: 06/07/2013 15:15
 Con. Extract Vol.: 5(mL) Dilution Factor: 1
 Injection Volume: 20(uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	11		0.020	0.0081	0.0046

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	123	D	60-155
STL01054	13C8 PFOS	125	D	45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-GW-MWEP351-0513 Lab Sample ID: 280-42839-12
 Matrix: Water Lab File ID: PC513F07030.d
 Analysis Method: PFOA/PFOS Date Collected: 05/30/2013 12:50
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 251.4 (mL) Date Analyzed: 06/07/2013 14:23
 Con. Extract Vol.: 5 (mL) Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.89		0.020	0.0080	0.0045
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.026	J	0.030	0.020	0.0097

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	123		60-155
STL01054	13C8 PFOS	111		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-GW-MWEP352-0513 Lab Sample ID: 280-42839-10
 Matrix: Water Lab File ID: PC513F07028.d
 Analysis Method: PFOA/PFOS Date Collected: 05/30/2013 10:30
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 252.4(mL) Date Analyzed: 06/07/2013 14:05
 Con. Extract Vol.: 5(mL) Dilution Factor: 1
 Injection Volume: 20(uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.83		0.020	0.0079	0.0045
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.020	U	0.030	0.020	0.0097

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	124		60-155
STL01054	13C8 PFOS	118		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-GW-RB02-053013 Lab Sample ID: 280-42839-14
 Matrix: Water Lab File ID: PC513F07032.d
 Analysis Method: PFOA/PFOS Date Collected: 05/30/2013 14:30
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 249.6 (mL) Date Analyzed: 06/07/2013 14:40
 Con. Extract Vol.: 5 (mL) Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0080	U	0.020	0.0080	0.0045
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.020	U	0.030	0.020	0.0098

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	124		60-155
STL01054	13C8 PFOS	115		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: NASB-EP-IN-0513 Lab Sample ID: 280-42839-1
 Matrix: Water Lab File ID: PC513F07016.d
 Analysis Method: PFOA/PFOS Date Collected: 05/29/2013 08:15
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 247.1 (mL) Date Analyzed: 06/07/2013 12:21
 Con. Extract Vol.: 5 (mL) Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	1.4		0.020	0.0081	0.0046
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.42		0.030	0.020	0.0099

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	125		60-155
STL01054	13C8 PFOS	119		45-130

APPENDIX C

REGIONAL WORKSHEETS

REGION I, EPA-NE ORGANIC REGIONAL DATA ASSESSMENT (ORDA)*

CASE #: 02958

SITE NAME: NAS Brunswick

LAB NAME: EST America

OF SAMPLES/MATRIX: _____

SDG #: 280-42839-1

VALIDATION CONTRACTOR: Tetra Tech

SOW #/CONTRACT #: _____

VALIDATOR'S NAME: J. Kalinyak

EPA-NE DV TIER LEVEL: _____

DATE DP REC'D BY EPA-NE: _____

TPO/PO: **ACTION ___ FYI ___

DV COMPLETION DATE: _____

ANALYTICAL DATA QUALITY SUMMARY

	VOA	SV	Pest/PCB
1. Preservation and Contractual Holding Times			
2. GC/MS / GC/ECD Instrument Performance Check			
3. Initial Calibration			
4. Continuing Calibration			
5. Blanks			
6. Surrogate Compounds			
7. Internal Standards			
8. Matrix Spike/Matrix Spike Duplicate			
9. Sensitivity Check			
10. PE Samples-Accuracy Check			
11. Target Compound Identification			
12. Compound Quantitation and Reported QLs			
13. Tentatively Identified Compounds			
14. Semivolatile Cleanup/Pesticide/PCB Cleanup			
15. Data Completeness			
16. Overall Evaluation of Data			

o = Data had no problems or were qualified due to minor contractual problems.

m = Data were qualified due to major contractual problems.

z = Data were rejected as unusable due major contractual problems.

ACTION ITEMS: (z items) _____

AREAS OF CONCERN: (m items) _____

COMMENTS: _____

*This form assesses the analytical data quality in terms of contractual compliance only. It does not assess sampling errors and/or non-contractual analytical issues that affect data quality.

**Check "ACTION" only if contractual defects resulted in reduced payment/data rejection recommendations.

Validator: J. Kalinyak

Date: 06/27/13

INSTRUCTIONS ON REVERSE SIDE

REGION I ORGANIC DATA VALIDATION

The following data package has been validated:

Lab Name Test America
Case/Project No. 00958
SDG No. 280-42839-1
No. of Samples/Matrix _____

SOW/Method No. _____
Sampling Date(s) _____
Shipping Date(s) _____
Date Rec'd by lab _____

Traffic Report Sample Nos. _____

Trip Blank No. _____

Equipment Blank No. _____

Bottle Blank No. _____

Field Duplicate Nos. _____

PES Nos. _____

The Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, revision _____ was used to evaluate the data and/or approved modifications to the EPA-NE Functional Guidelines were used to evaluate the data and are attached to this cover page: (attach modified criteria from EPA approved QAPjP or amendment to QAPjP).

A Tier II or Tier III evaluation was used to validate the data (circle one). If a Tier II validation with a partial Tier III was used, then identify samples, parameters, etc. that received partial Tier III validation

The data were evaluated based upon the following parameters:

- Overall Evaluation of Data
- Data Completeness (CSF Audit - Tier I)
- Preservation & Technical Holding Times
- GC/MS & GC/ECD Instrument Performance Check
- Initial & Continuing Calibrations
- Blanks
- Surrogate Compounds
- Internal Standards
- Matrix Spike/Matrix Spike Duplicate
- Field Duplicates
- Sensitivity Check
- PE Samples/Accuracy Check
- Target Compound Identification
- Compound Quantitation and Reported Quantitation Limits
- TICs
- Semivolatile and Pesticide/PCB Cleanup
- System Performance

Region I Definitions and Qualifiers:

- A - Acceptable Data
- J - Numerical value associated with compound is an estimated quantity.
- R - The data are rejected as unusable. The R replaces the numerical value or sample quantitation limit.
- U - Compound not detected at that numerical sample quantitation limit.
- UJ - The sample quantitation limit is an estimated quantity.
- TB, BB, EB - Compound detected in aqueous trip blank, aqueous bottle blank, or aqueous equipment blank associated with soil/sediment samples.

Validator's Name J Kalinyak Company Name Tetra Tech Phone Number 412-921-7132

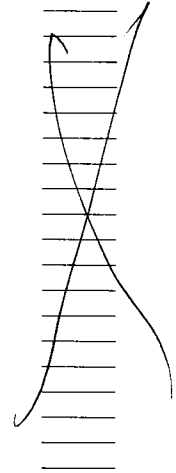
Date Validation Started _____ Date Validation Completed _____

EPA-NE
Data Validation Worksheet Cover Page - Page 2

Check if all criteria are met and no hard copy worksheet provided. Indicate NA if worksheet is not applicable to analytical method. Note: there is no standard worksheet for System Performance, however, the validator must document all system performance issues in the Data Validation Memorandum.

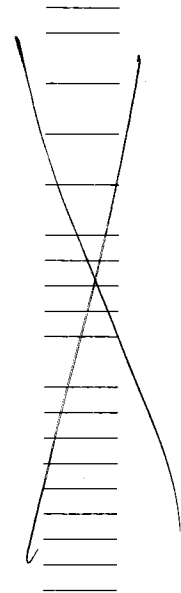
VOA/SV worksheets:

VOA/SV-Pest/PCB	COMPLETE SDG FILE (CSF) AUDIT
VOA/SV-Pest/PCB-I	PRESERVATION AND HOLDING TIMES
VOA/SV-II	GC/MS INSTRUMENT PERFORMANCE CHECK (TUNING)
VOA/SV-III	INITIAL CALIBRATION
VOA/SV-IV	CONTINUING CALIBRATION
VOA/SV-Pest/PCB-V-A	BLANK ANALYSIS
VOA/SV-Pest/PCB-V-B	BLANK ANALYSIS
VOA-VI	VOA SURROGATE SPIKE RECOVERIES
SV-VI	SV SURROGATE SPIKE RECOVERIES
VOA/SV-VII	INTERNAL STANDARD PERFORMANCE
VOA/SV-Pest/PCB-VIII	MATRIX SPIKE/MATRIX SPIKE DUPLICATE
VOA/SV-Pest/PCB-IX	FIELD DUPLICATE PRECISION
VOA/SV-Pest/PCB-X	SENSITIVITY CHECK
VOA/SV-Pest/PCB-XI	ACCURACY CHECK
VOA/SV-Pest/PCB-XII	TARGET COMPOUND IDENTIFICATION
VOA/SV-Pest/PCB-XIII	SAMPLE QUANTITATION
VOA/SV-XIV	TENTATIVELY IDENTIFIED COMPOUNDS
VOA/SV-XV	SEMIVOLATILE CLEANUP
TABLE II-WORKSHEET	OVERALL EVALUATION OF DATA



Pest/PCB worksheets:

VOA/SV-Pest/PCB	COMPLETE SDG FILE (CSF) AUDIT
VOA/SV-Pest/PCB-I	PRESERVATION AND HOLDING TIMES
Pest/PCB-IIA	GC/ECD INSTRUMENT PERFORMANCE CHECK- RESOLUTION
Pest/PCB-IIB	GC/ECD INSTRUMENT PERFORMANCE CHECK- RETENTION TIMES
Pest/PCB-IIC	GC/ECD INSTRUMENT PERFORMANCE CHECK- ACCURACY CHECK OF INITIAL CALIBRATION
Pest/PCB-IID	GC/ECD INSTRUMENT PERFORMANCE CHECK- PESTICIDE DEGRADATION
Pest/PCB-III	INITIAL CALIBRATION
Pest/PCB-IV	CONTINUING CALIBRATION
VOA/SV-Pest/PCB-V-A	BLANK ANALYSIS
VOA/SV-Pest/PCB-V-B	BLANK ANALYSIS
Pest/PCB-VI	SURROGATE COMPOUNDS: SPIKE RECOVERIES AND RETENTION TIME SHIFT
Pest/PCB-VII	PESTICIDE CLEANUP
VOA/SV-Pest/PCB-VIII	MATRIX SPIKE/MATRIX SPIKE DUPLICATE
VOA/SV-Pest/PCB-IX	FIELD DUPLICATE PRECISION
VOA/SV-Pest/PCB-X	SENSITIVITY CHECK
VOA/SV-Pest/PCB-XI	ACCURACY CHECK
Pest/PCB-XII	COMPOUND IDENTIFICATION
VOA/SV-Pest/PCB-XIII	SAMPLE QUANTITATION
TABLE II-WORKSHEET	OVERALL EVALUATION OF DATA



I certify that all criteria were met for the worksheets checked above.

Signature: _____

Name: _____

Date: _____

[Handwritten Signature]
[Handwritten Date: 06/27/13]

[Handwritten Name: J. Kalinyak]

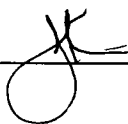
EPA-NE - Data Validation Worksheet
Overall Evaluation of Data - Data Validation Memorandum - Table II

N/A

VOLATILE ORGANICS					
DQO (list all DQOs)	Sampling and/or Analytical Method Appropriate Yes or No	Measurement Error		Sampling Variability**	Potential Usability Issues
		Analytical Error	Sampling Error*		

* The evaluation of "sampling error" cannot be completely assessed in data validation.

** Sampling variability is not assessed in data validation.

Validator: 

Date: 06/27/13

EPA-NE - Data Validation Worksheet
Overall Evaluation of Data - Data Validation Memorandum - Table II

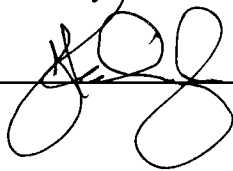
N/A

SEMIVOLATILE ORGANICS					
DQO (list all DQOs)	Sampling and/or Analytical Method Appropriate Yes or No	Measurement Error		Sampling Variability**	Potential Usability Issues
		Analytical Error	Sampling Error*		

* The evaluation of "sampling error" cannot be completely assessed in data validation.

** Sampling variability is not assessed in data validation.

Validator: _____




Date: 6/27/13

COMPLETE SDG FILE (CSF) AUDIT

Organic Fractions: PFOA/PFOS

<u>Missing Information</u>	<u>Date Lab Contacted</u>	<u>Date Received</u>
----------------------------	---------------------------	----------------------

N/A		

Validator: 

Date: 06/27/13

Sampler: _____ Company: _____ Contacted: Yes No Date: _____

I. **PRESERVATION AND HOLDING TIMES** - Circle sample numbers with exceeded technical holding times or omitted preservation.
 List all required preservation codes and circle omitted preservation codes.
 Circle all exceeded technical holding times.
 Identify extraction technique after "# of Days"/(*Extraction Code).

See DV Report

Sample No. (TR No.)	Matrix	Pres. Code	Date Sampled	VOA			BNA			PEST/PCB				
				Date Analyzed	# of Days from Samp. to Anal.	Action	Date Extracted	# of Days from Samp. to Extr./(*)	Action	Date Analyzed	# of Days from Samp. to Extr./(*)	Action		

Preservation Code:
 1. Cool @ 4°C (± 2°)
 2. Preserve with HCl to at least pH 2
 3. Protect from light
 4. Freeze
 5. Room Temperature (Avoid excessive heat)

Validator: _____ *JK*

(*Extraction Code:)
 L/L - Liquid/Liquid
 SON - Sonication
 SEP - Separatory Funnel
 SOX - Soxhlet
 SPE - Solid Phase Extraction

Action Code:
 J - Estimate (J) Detected Values
 UJ - Estimate (UJ) Non-Detected Values
 R - Reject (R) Non-Detected Values

Date: 06/27/13

II. GC/MS INSTRUMENT PERFORMANCE CHECK (TUNING)

See DV Report

List all Instrument Performance Checks that are outside method QC tuning acceptance criteria.

Volatile Instrument Performance Check (Compound Name)	Analysis Date and Time	Instrument	Ion(s) Affected	Percent Relative Abundance	QC Limits	Samples Affected	Action
Comments:							
Semivolatile Instrument Performance Check (Compound Name)	Analysis Date and Time	Instrument	Ion(s) Affected	Percent Relative Abundance	QC Limits	Samples Affected	Action
Comments:							

If tuning compounds and criteria are different from those specified in CLP SOW OLM03.1, then the validator should include a copy of the method-specific tuning criteria with this worksheet.

Validator: *[Signature]*

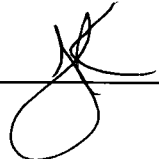
Date: *06/27/13*

EPA-NE - Data Validation Worksheet
VOA/SV-III

III. INITIAL CALIBRATION - List all analytes that are outside calibration criteria.

See DV Report

Date of ICAL	Instrument	Parameter	Matrix	Compound	% RSD	RRF	Samples Affected	Action
Comments:								

Validator: 

Date: 06/27/13

EPA-NE - Data Validation Worksheet
 VOA/SV-IV

See DV Report

IV. CONTINUING CALIBRATION - List all analytes that are outside calibration criteria.

Date of ICAL	Date of CCAL	Instrument	Parameter	Matrix	Compound	%D	RRF	Samples Affected	Action

Comments:

Validator: *[Signature]*

Date: 06/27/13
 12/96

See DV Report

V. BLANK ANALYSIS

List the blank contamination below.

Concentration Level: _____

Sampler: _____ Company: _____

Contacted: Yes No Date: _____

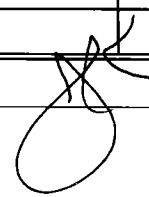
1. Laboratory: Method, Storage and Instrument Blanks

Date Extracted	Date Analyzed	Parameter/ Matrix	Sample No. (Blank Type)	Instrument/ Column	Compound	Conc. (units)

2. Field: Equipment (Rinsate), Trip and Bottle Blanks

Date Extracted	Date Analyzed	Parameter/ Matrix	Sample No. (Blank Type)	Instrument/ Column	Compound	Conc. (units)

Validator: _____



Date: 06/27/13

EPA-NE - Data Validation Worksheet
VOA/SV - Pest/PCB-V-B

3. **Blank Actions** - List the maximum concentrations of blank compounds.

See DV Report

Compound	Type of Blank	Date Blank Sampled/Originated	Max. Conc. (units)	Action Level (units)	Sample QL	Samples Affected	Action

Comments: _____

Validator: JK

Date: 06/27/13
12/96

See DV Report

VI. VOA SURROGATE SPIKE RECOVERIES - List all surrogate compound recoveries that are outside method QC acceptance criteria.

Method	Volatile Method QC Acceptance Criteria					
	Toluene-d ₈		BFB		DCE-d ₄	Other:
OLM03.2	Water 88-110	Soil 84-138	Water 86-115	Soil 59-113	Water 76-114	Soil 70-121
OLC02.1	NA		80-120		NA	
Other:						
Sample Number/Matrix	% Recovery		% Recovery		% Recovery	Action

Validator: _____

Date: 06/27/13

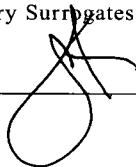
See DV Report

VI. SV SURROGATE SPIKE RECOVERIES - List all surrogate compound recoveries that are outside method QC acceptance criteria.

Method	Base/Neutral Method QC Acceptance Criteria								
	NBZ-d ₅		2-FBP		TPH-d ₁₄	1,2-DCB-d ₄ *	Other:		
OLM03.2	Water 35-114	Soil 23-120	Water 43-116	Soil 30-115	Water 33-141	Soil 18-137	Water 16-110	Soil 20-130	
OLC02.1	40-110		30-110		20-140		NA		
Other:									
Sample Number/Matrix	% Recovery		% Recovery		% Recovery		% Recovery		Action
Method	Acid Method QC Acceptance Criteria								
Method	Phenol-d ₅		2-FP		2,4,6-TBP	2-CP-d ₄ *	Other:		
	Water 10-110	Soil 24-113	Water 21-110	Soil 25-121	Water 10-123	Soil 19-122	Water 33-110	Soil 20-130	
OLM03.2	15-115		15-110		15-130		NA		
OLC02.1									
Other:									
Sample Number/Matrix	% Recovery		% Recovery		% Recovery		% Recovery		Action

* Advisory Surrogates - OLM03.2

Validator: _____



Date: 06/27/13

See DV Report

VII. INTERNAL STANDARD PERFORMANCE

List the internal standards that are outside the area count and retention time method QC acceptance criteria.

IS Area Count method QC acceptance criteria: _____

IS Retention Time method QC acceptance criteria: _____

Sample Number (TR#)	Date and Time Analyzed	Instrument	Parameter	IS Outside Area Count and/or RT Criteria	IS Area	RT Shift	Acceptable Range (IS area or RT shift)	Action

Validator: *[Signature]*

Date: 06/27/13

See DV Report


EPA-NE - Data Validation Worksheet
VOA/SV - Pest/PCB-VIII

VIII. MATRIX SPIKE/MATRIX SPIKE DUPLICATE - List all MS/MSD analytes that are outside method QC acceptance criteria.

Use a separate worksheet for each MS/MSD pair.

Sample # _____ Matrix _____ Concentration Level _____

Parameter	Compound	MS %Rec	MSD %Rec	RPD	Method QC Limits		Concentration			% RSD	Action
					% Rec	RPD	Unspiked Sample	MS	MSD		

Validator: 

Date: 06/27/13

See ND Report

IX. FIELD DUPLICATE PRECISION - List all field duplicate analytes that are outside criteria.

Use a separate worksheet for each field duplicate pair.

Sample Number _____ Duplicate Sample Number _____ Matrix _____

Parameter	Compound	Sample Conc.	Sample QL		Duplicate Conc.	Duplicate QL		RPD	QC Acceptance Criteria RPD or NA*	Action
			SQL	2xSQL		SQL	2xSQL			

* For instances where one duplicate result is ND (or reported less than the sample QL).

Does the MS/MSD data indicate acceptable laboratory precision? Y N

Comments: _____

Sampler Name: _____ Contractor Name: _____ Date Contacted: _____

Reason for Contact and resolution obtained: _____

Validator: *JK* Date: *06/27/13*

See DV Report

X. SENSITIVITY CHECK (Method Detection Limit Study)

List all compounds, surrogates, and internal standards that are outside the MDL criteria.

- Has an appropriate MDL study been submitted with seven replicates for each compound and matrix of interest? Y N
- Date of Preparation/Analysis: _____ Within 1 year? Y N
- Instrument I.D.: _____ Same as samples? Y N
- Column I.D.: _____ Same as samples? Y N

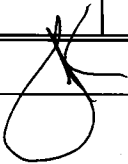
Matrix	Compound	MDL > QL	Method QC Limits < 80% or > 120%	IS Outside Area Count and/or RT Criteria	RSD > 20%	Samples Affected	Action

If an MDL study has not been submitted, use only the LFB results to evaluate data.

(Laboratory Fortified Blank) - List all LFB compounds, surrogates and internal standards that are outside criteria.

- Has an appropriate and complete LFB been submitted at the proper frequency? Y N
- Does it contain all target compounds at the method-required QLS? Y N
- Was the LFB spiked with a standard from a source (vendor) independent of the calibration standard? Y N

Matrix	Compound	Method QC Limits < 60% or > 140% Other:	IS Outside Area Count and/or RT Criteria	Samples Affected	Action

Validator: 

Date: 06/27/13

XI. ACCURACY CHECK (Performance Evaluation Results) - List all analytes that are outside criteria.

SDG No: _____ CASE: _____

See QV Report

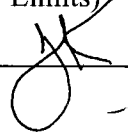
Are more than one-half of the PES analytes within criteria for each parameter.

Y N

PE Sample Number	Ampule Number	Parameter	Type of PES	Matrix	Analyte	Conc.	Region I EPA PES Scores*	Non-EPA PES Scores**	Samples Affected	Action

* For Region I PESs indicate the Region I PES Score Report Result: Action High; Action Low; TCL MISS; TCL CONTAMINANT; TIC HIT; TIC MISS; TIC CONTAMINANT

** For Non-EPA PESs indicate the Non-EPA PES Score: PES COMPOUND MISS; PES COMPOUND CONTAMINANT; PES COMPOUND HIT (% Recovery Limits)


Validator: 

Date: 06/27/13

See ON Report

XII. TARGET COMPOUND IDENTIFICATION - List the analytes that are outside the acceptance criteria.

Sample Number	Compound	MS Ions	RRT	Action

Validator: 

Date: 06/27/13

See DV Report

XIII. SAMPLE QUANTITATION

Recalculate, from the raw data, the concentrations for one positive detect and one reported sample quantitation limit for a non-detect in a diluted sample or soil sample per fraction. (Note: Although Section XIII, C.1.a, requires that one calculation for each fraction in each sample be performed, the validator is only required to reproduce an example, for each fraction, of one positive detect and one sample quantitation limit calculation on this worksheet.)

Do all soil/sediment samples have % solids greater than 30%?
 If no, list sample numbers _____

Y N

Fraction		Calculation
VOA		
Sample No.:		
Reported Compound:		
Reported Value:		
Not Detected Compound:		
Reported Quantitation Limit:		
BNA		
Sample No.:		
Reported Compound:		
Reported Value:		
Not Detected Compound:		
Reported Quantitation Limit:		
Pesticide/PCB		
Sample No.:		
Reported Compound:		
Reported Value:		
Not Detected Compound:		
Reported Quantitation Limit:		

Validator: JK

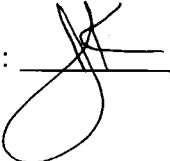
Date: 06/27/13

See ~~10~~ Report

XIV. TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

List the 5 TICs having the highest concentration for each sample parameter.

Sample Number	Parameter	Compound	__RRT	__Est. Conc.	Action

Validator: 

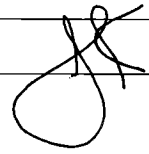
Date: 06/27/13
12/96

See DV Report

XV. SEMIVOLATILE CLEANUP - List all analytes that are outside method cleanup QC criteria.

Cleanup Procedure	Instrument # or Lot #	Date/Time GPC Calibrated or Check Solution Analyzed	Compound	% Rec	QC Limits	Samples Affected	Action

Did the GPC column meet; resolution requirements? Y or N
 peak shape requirements? Y or N
 retention time shift requirements? Y or N
 Was the GPC calibration, Silica Gel cleanup checked at the method required frequency with correct compounds and concentrations? Y or N
 Were all compounds less than QL for the GPC/Silica Gel/Acid-Partition blank? Y or N
 Did the blank surrogate recoveries and IS area counts and RTs (if added) meet method QC acceptance criteria? Y or N
 Comments: _____

Validator:  _____

Date: 06/27/13

APPENDIX D

SUPPORT DOCUMENTATION

HOLDTIME

SDG 280-42839-1

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
ACID	UG/L	NASB-EP-IN-0513	280-42839-1	NM	5/29/2013	6/3/2013	6/7/2013	5	4	9
ACID	UG/L	NASB-EP-GW-RB02-0530	280-42839-14	NM	5/30/2013	6/3/2013	6/7/2013	4	4	8
ACID	UG/L	NASB-EP-GW-MWEP352-	280-42839-10	NM	5/30/2013	6/3/2013	6/7/2013	4	4	8
ACID	UG/L	NASB-EP-GW-MWEP351-	280-42839-12	NM	5/30/2013	6/3/2013	6/7/2013	4	4	8
ACID	UG/L	NASB-EP-GW-MWEP347-	280-42839-7	NM	5/29/2013	6/3/2013	6/7/2013	5	4	9
ACID	UG/L	NASB-EP-GW-MW335-05	280-42839-9	NM	5/30/2013	6/3/2013	6/7/2013	4	4	8
ACID	UG/L	NASB-EP-GW-MW334-05	280-42839-11	NM	5/30/2013	6/3/2013	6/7/2013	4	4	8
ACID	UG/L	NASB-EP-GW-MW323-05	280-42839-6	NM	5/29/2013	6/3/2013	6/7/2013	5	4	9
ACID	UG/L	NASB-EP-GW-MW1104-0	280-42839-4	NM	5/29/2013	6/3/2013	6/7/2013	5	4	9
ACID	UG/L	NASB-EP-GW-MGBR-MW	280-42839-5	NM	5/29/2013	6/3/2013	6/7/2013	5	4	9
ACID	UG/L	NASB-EP-GW-EW05B-05	280-42839-3	NM	5/29/2013	6/3/2013	6/7/2013	5	4	9
ACID	UG/L	NASB-EP-GW-DUP04-05	280-42839-13	NM	5/29/2013	6/3/2013	6/7/2013	5	4	9
ACID	UG/L	NASB-EP-GW-DUP03-05	280-42839-8	NM	5/29/2013	6/3/2013	6/7/2013	5	4	9
ACID	UG/L	NASB-EP-EF-0513	280-42839-2	NM	5/29/2013	6/3/2013	6/7/2013	5	4	9

Chain of Custody Record



280-42839 Chain of Custody

er ID _____
 uture on Receipt _____
 igh Water? Yes No

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124-280 (0508)

Client: **Tetra Tech** Project Manager: **Jim Forrelli** Date: _____ Chain of Custody Number: **173779**
 Address: **250 Andover St. Suite 200** Telephone Number (Area Code)/Fax Number: **978-474-8400 / 978-474-8499** Lab Number: _____ Page: **1** of **2**

City: **Wilmington** State: **MA** Zip Code: **01887** Site Contact: **Brian Gesinger** Lab Contact: **Michelle Johnston**
 Project Name and Location (State): **Eastern Plume - PFC Sampling** Carrier/Waybill Number: _____
 Analysis (Attach list if more space is needed)

Contract/Purchase Order/Quote No. **CTO 432**

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix				Containers & Preservatives					PEOA/PFOS	Special Instructions/ Conditions of Receipt		
			Air	Aqueous	Sed.	Soil	Unpres	H2SO4	HNO3	HCl	NaOH			ZnAc2/NaOH	
NASB-EP-IN-0513	05/29/13	0815	X				X					X			
NASB-EP-EF-0513	" "	0820	X				X					X			
NASB-EP-GW-EW05B-0513	↓	0840	X				X					X			
NASB-EP-GW-MW1104-0513		1004	X				X					X			
NASB-EP-GW-M6BR-MW04-0513		1135	X				X					X			
NASB-EP-GW-MW323-0513		1530	X				X					X			
NASB-EP-GW-MWEP347-0513		1535	X				X					X			
NASB-EP-GW-DUP03-052913		↓	-	X				X					X		
NASB-EP-GW-MW335-0513		05/30/13	0934	X				X					X		LAB QC
NASB-EP-GW-MWEP352-0513	" "	1030	X				X					X			
NASB-EP-GW-MW334-0513	↓	1205	X				X					X			
NASB-EP-GW-MWEP351-0513	↓	1250	X				X					X			

Possible Hazard Identification: Non-Hazard Flammable Skin Irritant Poison B Unknown Return To Client Disposal By Lab Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: 24 Hours 48 Hours 7 Days 14 Days 21 Days Other _____
 QC Requirements (Specify)

1. Relinquished By: [Signature]	Date: 5/30/13	Time: 1500	1. Received By: [Signature]	Date: 5/30/13	Time: 0915
2. Relinquished By: _____	Date: _____	Time: _____	2. Received By: _____	Date: _____	Time: _____
3. Relinquished By: _____	Date: _____	Time: _____	3. Received By: _____	Date: _____	Time: _____

Comments

Chain of Custody Record

Sampler ID _____

Temperature on Receipt 4.4 ^W

Drinking Water? Yes No 5/31/13

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124-280 (0508)

Client Tetra Tech		Project Manager Jim Forrelli		Date	Chain of Custody Number 173780
Address 250 Andover St, #200		Telephone Number (Area Code)/Fax Number 978-474-8400 / 978-474-8499		Lab Number	Page <u>2</u> of <u>2</u>

City Wilmington	State MA	Zip Code 01887	Site Contact Brian Geringer	Lab Contact Michelle Johnston	Analysis (Attach list if more space is needed)	Special Instructions/ Conditions of Receipt
Project Name and Location (State) Eastern Plume - PFC Sampling			Carrier/Waybill Number			
Contract/Purchase Order/Quote No. CTO 432						

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix				Containers & Preservatives						Analysis (Attach list if more space is needed)	Special Instructions/ Conditions of Receipt			
			Air	Aqueous	Sed	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH					
NASB-EP-GW-DUPO4-052913	5/29/13	-		X													
NASB-EP-GW-RB02-053013	5/30/13	1430		X						X							

Page 97 of 98

Possible Hazard Identification	Sample Disposal	(A fee may be assessed if samples are retained longer than 1 month)
<input 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 type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	

Turn Around Time Required	QC Requirements (Specify)
<input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/> 7 Days <input type="checkbox"/> 14 Days <input checked="" type="checkbox"/> 21 Days <input type="checkbox"/> Other _____	

1. Relinquished By Ben Gyi	Date 5/31/13	Time 1500	1. Received By Edin Branda	Date 5/31/13	Time 0915
2. Relinquished By	Date	Time	2. Received By	Date	Time
3. Relinquished By	Date	Time	3. Received By	Date	Time

Comments

Login Sample Receipt Checklist

Client: Tetra Tech, Inc

Job Number: 280-42839-1

Login Number: 42839

List Source: TestAmerica Denver

List Number: 1

Creator: Broander, Laura

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.	True	
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.	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.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

CASE NARRATIVE
Client: Tetra Tech
Project: Eastern Plume - PFC Sampling
Contract Task Order: N62470-08-D-1001 / CTO 432
Project Manager: Vanessa Good
Report Number: 280-42839-1

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.

The PFC method DV-LC-0012 is an isotope dilution method; therefore, the internal standards are added prior to the extraction process. This technique inherently corrects for variability in the extraction efficiency due to sample matrix. Dilution of samples beyond the ability of the instrument to detect the internal standards is not recommended. Analyses performed at a dilution level requiring additional internal standard to be added after the extraction step in order to quantitate results has been shown to yield results with a significant low bias. As a result, data have been reported that exceed the calibration range and are qualified as estimated.

The PFC method is an isotope dilution method where the internal standards are added prior to extraction and used to quantitate results; therefore, the use of dilution factors is inappropriate. Application of dilution factors would yield results that are artificially high. Reporting limits and method detection limits are not adjusted for dilutions unless samples are fortified with additional internal standard, which is not recommended.

Internal standard abundances may vary depending upon both recovery and the dilution at which the analysis is performed. This is an inherent feature of the isotope dilution technique and is not indicative of bias to the reported results.

RECEIPT

The following report contains the analytical results for fourteen samples received at TestAmerica Denver on May 31, 2013, according to documented sample acceptance procedures. The samples were received in good condition at a temperature of 4.4°C. No anomalies were encountered during sample receipt.

PFOA & PFOS

Samples NASB-EP-IN-0513 (280-42839-1), NASB-EP-EF-0513 (280-42839-2), NASB-EP-GW-EW05B-0513 (280-42839-3), NASB-EP-GW-MW1104-0513 (280-42839-4), NASB-EP-GW-MGBR-MW04-0513 (280-42839-5), NASB-EP-GW-MW323-0513 (280-42839-6), NASB-EP-GW-MWEP347-0513 (280-42839-7), NASB-EP-GW-DUP03-052913 (280-42839-8), NASB-EP-GW-MW335-0513 (280-42839-9), NASB-EP-GW-MWEP352-0513 (280-42839-10), NASB-EP-GW-MW334-0513 (280-42839-11), NASB-EP-GW-MWEP351-0513 (280-42839-12), NASB-EP-GW-DUP04-052913 (280-42839-13) and NASB-EP-GW-RB02-053013 (280-42839-14) were analyzed for PFC in accordance with SOP DV-LC-0012. The samples were prepared on 06/03/2013 and analyzed on 06/07/2013.

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to analytes present above the linear calibration curve, four samples had to be analyzed at dilutions as outlined below.

NASB-EP-GW-EW05B-0513 (280-42839-3) 10X Run Type DL

NASB-EP-GW-MW323-0513 (280-42839-6) 10X Run Type DL

NASB-EP-GW-MWEP347-0513 (280-42839-7) 10X Run Type DL

NASB-EP-GW-DUP04-052913 (280-42839-13) 10X Run Type DL

Internal standards (IS) were not fortified, therefore, the IS percent recoveries need to be multiplied by 10 and the MDLs/RLs were not updated due to limitations in the software. Internal standards and surrogate recoveries in the diluted analyses may have recovered outside the control limits as a result of the dilutions.

No other difficulties were encountered during the PFC analyses.

All other quality control parameters were within the acceptance limits.

SAMPLE SUMMARY

Client: Tetra Tech, Inc

Job Number: 280-42839-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
280-42839-1	NASB-EP-IN-0513	Water	05/29/2013 0815	05/31/2013 0915
280-42839-2	NASB-EP-EF-0513	Water	05/29/2013 0820	05/31/2013 0915
280-42839-3	NASB-EP-GW-EW05B-0513	Water	05/29/2013 0840	05/31/2013 0915
280-42839-4	NASB-EP-GW-MW1104-0513	Water	05/29/2013 1004	05/31/2013 0915
280-42839-5	NASB-EP-GW-MGBR-MW04-0513	Water	05/29/2013 1135	05/31/2013 0915
280-42839-6	NASB-EP-GW-MW323-0513	Water	05/29/2013 1530	05/31/2013 0915
280-42839-7	NASB-EP-GW-MWEP347-0513	Water	05/29/2013 1535	05/31/2013 0915
280-42839-8FD	NASB-EP-GW-DUP03-052913	Water	05/29/2013 0000	05/31/2013 0915
280-42839-9	NASB-EP-GW-MW335-0513	Water	05/30/2013 0934	05/31/2013 0915
280-42839-9MS	NASB-EP-GW-MW335-0513	Water	05/30/2013 0934	05/31/2013 0915
280-42839-9MSD	NASB-EP-GW-MW335-0513	Water	05/30/2013 0934	05/31/2013 0915
280-42839-10	NASB-EP-GW-MWEP352-0513	Water	05/30/2013 1030	05/31/2013 0915
280-42839-11	NASB-EP-GW-MW334-0513	Water	05/30/2013 1205	05/31/2013 0915
280-42839-12	NASB-EP-GW-MWEP351-0513	Water	05/30/2013 1250	05/31/2013 0915
280-42839-13FD	NASB-EP-GW-DUP04-052913	Water	05/29/2013 0000	05/31/2013 0915
280-42839-14RB	NASB-EP-GW-RB02-053013	Water	05/30/2013 1430	05/31/2013 0915

METHOD SUMMARY

Client: Tetra Tech, Inc

Job Number: 280-42839-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
PFOA/PFOS LC/MS/MS	TAL DEN	TestAmerica SOP PFOA/PFOS	
Solid-Phase Extraction (SPE)	TAL DEN		SW846 3535

Lab References:

TAL DEN = TestAmerica Denver

Method References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TestAmerica SOP = TestAmerica, Inc., Standard Operating Procedure

DATA REPORTING QUALIFIERS

Client: Tetra Tech, Inc

Job Number: 280-42839-1

Lab Section	Qualifier	Description
LCMS	J	Estimated: The analyte was positively identified; the quantitation is an estimation
	D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.
	U	Undetected at the Limit of Detection.

Method LCMS PFOA

PFOA/PFOS (LC/MS/MS) by Method
LCMS_PFOA

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 280-42839-1

SDG No.: _____

Instrument ID: LC_LCMS5 Start Date: 04/17/2013 11:38

Analysis Batch Number: 171896 End Date: 04/17/2013 13:23

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ICB 280-171896/1		04/17/2013 11:38	1		Gemini-NX
STD0002 280-171896/2 IC	CAL	04/17/2013 11:47	1	PC513D17010c.d	Gemini-NX
STD0005 280-171896/3 IC		04/17/2013 11:56	1	PC513D17011c.d	Gemini-NX
STD0010 280-171896/4 IC		04/17/2013 12:04	1	PC513D17012c.d	Gemini-NX
STD0020 280-171896/5 ICISAV		04/17/2013 12:13	1	PC513D17013c.d	Gemini-NX
STD0050 280-171896/6 IC		04/17/2013 12:22	1	PC513D17014c.d	Gemini-NX
STD0100 280-171896/7 IC		04/17/2013 12:31	1	PC513D17015c.d	Gemini-NX
STD0200 280-171896/8 IC		04/17/2013 12:39	1	PC513D17016c.d	Gemini-NX
STD0500 280-171896/9 IC		04/17/2013 12:48	1	PC513D17017c.d	Gemini-NX
STD1250 280-171896/10 IC		04/17/2013 12:57	1	PC513D17018c.d	Gemini-NX
CCB 280-171896/11			04/17/2013 13:05	1	PC513D17019c.d
ICV 280-171896/12		04/17/2013 13:14	1	PC513D17020c.d	Gemini-NX
DLCK 280-171896/13		04/17/2013 13:23	1	PC513D17021c.d	Gemini-NX

FORM VI
LCMS INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 280-42839-1 Analy Batch No.: 171896

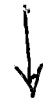
SDG No.: _____

Instrument ID: LC_LCMS5 GC Column: Gemini-NX ID: _____ Heated Purge: (Y/N) N

Calibration Start Date: 04/17/2013 11:47 Calibration End Date: 04/17/2013 12:57 Calibration ID: 13823

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD0002 280-171896/2	PC513D17010c.d
Level 2	STD0005 280-171896/3	PC513D17011c.d
Level 3	STD0010 280-171896/4	PC513D17012c.d
Level 4	STD0020 280-171896/5	PC513D17013c.d
Level 5	STD0050 280-171896/6	PC513D17014c.d
Level 6	STD0100 280-171896/7	PC513D17015c.d
Level 7	STD0200 280-171896/8	PC513D17016c.d
Level 8	STD0500 280-171896/9	PC513D17017c.d
Level 9	STD1250 280-171896/10	PC513D17018c.d



ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7	LVL 8	LVL 9													
Ammonium Perfluorooctanoate (APFO)	1.1502	0.9875	0.9506	0.8759	0.7969	Lin2	0.0857	0.7793						0.9910		0.9800	
	0.8217	0.7550	0.7543	0.6527													
Perfluorooctanoic acid (PFOA)	1.1969	1.0276	0.9892	0.9115	0.8293	Lin2	0.0857	0.8109						0.9910		0.9800	
	0.8550	0.7857	0.7849	0.6792													
Perfluorooctane Sulfonate (PFOS)	1.2748	1.2677	1.2092	1.1661	1.0398	Lin2	0.0604	1.0335						0.9900		0.9800	
	1.0527	0.9718	0.9881	0.8922													
13C8 PFOA	1.8014	1.2306	1.0371	0.9216	0.8092	Lin2	0.2106	0.7760						0.9940		0.9800	
	0.8411	0.7876	0.7666	0.6585													
13C8 PFOS	1.3861	1.0941	0.8546	0.8569	0.7798	Lin2	0.1259	0.7555						0.9950		0.9800	
	0.8150	0.7473	0.7624	0.6719													

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 280-42839-1 Analy Batch No.: 171896

SDG No.: _____

Instrument ID: LC_LCMS5 GC Column: Gemini-NX ID: _____ Heated Purge: (Y/N) N

Calibration Start Date: 04/17/2013 11:47 Calibration End Date: 04/17/2013 12:57 Calibration ID: 13823

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD0002 280-171896/2	PC513D17010c.d
Level 2	STD0005 280-171896/3	PC513D17011c.d
Level 3	STD0010 280-171896/4	PC513D17012c.d
Level 4	STD0020 280-171896/5	PC513D17013c.d
Level 5	STD0050 280-171896/6	PC513D17014c.d
Level 6	STD0100 280-171896/7	PC513D17015c.d
Level 7	STD0200 280-171896/8	PC513D17016c.d
Level 8	STD0500 280-171896/9	PC513D17017c.d
Level 9	STD1250 280-171896/10	PC513D17018c.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7	LVL 8	LVL 9		LVL 6	LVL 7	LVL 8	LVL 9	
Ammonium Perfluorooctanoate (APFO)	OA	Lin2	370275	828749	1586556	2659164	6576975	0.208	0.520	1.04	2.08	5.20
			12439358	22873226	48833152	101483796		10.4	20.8	52.0	130	
Perfluorooctanoic acid (PFOA)	OA	Lin2	370275	828749	1586556	2659164	6576975	0.200	0.500	1.00	2.00	5.00
			12439358	22873226	48833152	101483796		10.0	20.0	50.0	125	
Perfluorooctane Sulfonate (PFOS)	PFOS	Lin2	127744	333363	642030	1143086	2796616	0.191	0.478	0.956	1.91	4.78
			5407606	9905497	21393053	42212610		9.56	19.1	47.8	120	
13C8 PFOA	OA	Lin2	557289	992467	1663382	2688751	6417869	0.200	0.500	1.00	2.00	5.00
			12236933	22928970	47691140	98393940		10.0	20.0	50.0	125	
13C8 PFOS	PFOS	Lin2	138896	287711	453781	839955	2097349	0.191	0.478	0.956	1.91	4.78
			4186436	7617439	16506735	31789946		9.56	19.1	47.8	120	

Curve Type Legend:

Lin2 = Linear 1/conc^2 ISTD

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Lab Sample ID: ICV 280-171896/12 Calibration Date: 04/17/2013 13:14
 Instrument ID: LC_LCMS5 Calib Start Date: 04/17/2013 11:47
 GC Column: Gemini-NX ID: _____ Calib End Date: 04/17/2013 12:57
 Lab File ID: PC513D17020c.d Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ammonium Perfluorooctanoate (APFO)	Lin2		0.9177		2.34	2.08	12.5	30.0
Perfluorooctanoic acid (PFOA)	Lin2		0.9550		2.25	2.00	12.5	30.0
Perfluorooctane Sulfonate (PFOS)	Lin2		1.282		2.45	2.02	21.2	30.0
13C8 PFOA	Lin2		0.9572		2.20	2.00	9.8	30.0
13C8 PFOS	Lin2		0.8739		2.05	1.91	7.0	30.0

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: CCB 280-171896/11
 Matrix: Water Lab File ID: PC513D17019c.d
 Analysis Method: PFOA/PFOS Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1 (mL) Date Analyzed: 04/17/2013 13:05
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 171896 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0080	U	0.55	0.0080	0.0045
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.020	U	0.15	0.020	0.0098

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA			
STL01054	13C8 PFOS			

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Denver

Job No.: 280-42839-1

SDG No.: _____

Instrument ID: LC_LCMS5

Start Date: 06/07/2013 11:54

Analysis Batch Number: 177740

End Date: 06/07/2013 15:33

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 280-177740/10		06/07/2013 11:54	1	PC513F07013.d	Gemini-NX
MB 280-176976/1-A		06/07/2013 12:03	1	PC513F07014.d	Gemini-NX
LCS 280-176976/2-A		06/07/2013 12:12	1	PC513F07015.d	Gemini-NX
280-42839-1	NASB-EP-IN-0513	06/07/2013 12:21	1	PC513F07016.d	Gemini-NX
280-42839-2	NASB-EP-EF-0513	06/07/2013 12:29	1	PC513F07017.d	Gemini-NX
280-42839-3	NASB-EP-GW-EW05B-0513	06/07/2013 12:38	1	PC513F07018.d	Gemini-NX
280-42839-4	NASB-EP-GW-MW1104-0513	06/07/2013 12:47	1	PC513F07019.d	Gemini-NX
280-42839-5	NASB-EP-GW-MGBR-MW04-0513	06/07/2013 12:56	1	PC513F07020.d	Gemini-NX
280-42839-6	NASB-EP-GW-MW323-0513	06/07/2013 13:04	1	PC513F07021.d	Gemini-NX
280-42839-7	NASB-EP-GW-MWEP347-0513	06/07/2013 13:13	1	PC513F07022.d	Gemini-NX
280-42839-8	NASB-EP-GW-DUP03-052913	06/07/2013 13:22	1	PC513F07023.d	Gemini-NX
CCV 280-177740/21		06/07/2013 13:30	1	PC513F07024.d	Gemini-NX
280-42839-9	NASB-EP-GW-MW335-0513	06/07/2013 13:39	1	PC513F07025.d	Gemini-NX
280-42839-9 MS	NASB-EP-GW-MW335-0513 MS	06/07/2013 13:48	1	PC513F07026.d	Gemini-NX
280-42839-9 MSD	NASB-EP-GW-MW335-0513 MSD	06/07/2013 13:57	1	PC513F07027.d	Gemini-NX
280-42839-10	NASB-EP-GW-MWEP352-0513	06/07/2013 14:05	1	PC513F07028.d	Gemini-NX
280-42839-11	NASB-EP-GW-MW334-0513	06/07/2013 14:14	1	PC513F07029.d	Gemini-NX
280-42839-12	NASB-EP-GW-MWEP351-0513	06/07/2013 14:23	1	PC513F07030.d	Gemini-NX
280-42839-13	NASB-EP-GW-DUP04-052913	06/07/2013 14:32	1	PC513F07031.d	Gemini-NX
280-42839-14	NASB-EP-GW-RB02-053013	06/07/2013 14:40	1	PC513F07032.d	Gemini-NX
280-42839-3 DL	NASB-EP-GW-EW05B-0513 DL	06/07/2013 14:49	1	PC513F07033.d	Gemini-NX
280-42839-6 DL	NASB-EP-GW-MW323-0513 DL	06/07/2013 14:58	1	PC513F07034.d	Gemini-NX
CCV 280-177740/32		06/07/2013 15:07	1	PC513F07035.d	Gemini-NX
280-42839-7 DL	NASB-EP-GW-MWEP347-0513 DL	06/07/2013 15:15	1	PC513F07036.d	Gemini-NX
280-42839-13 DL	NASB-EP-GW-DUP04-052913 DL	06/07/2013 15:24	1	PC513F07037.d	Gemini-NX
CCV 280-177740/35		06/07/2013 15:33	1	PC513F07038.d	Gemini-NX

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Lab Sample ID: CCV 280-177740/10 Calibration Date: 06/07/2013 11:54
 Instrument ID: LC_LCMS5 Calib Start Date: 04/17/2013 11:47
 GC Column: Gemini-NX ID: _____ Calib End Date: 04/17/2013 12:57
 Lab File ID: PC513F07013.d Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ammonium Perfluorooctanoate (APFO)	Lin2		0.9926		6.52	5.20	25.3	30.0
Perfluorooctanoic acid (PFOA)	Lin2		1.033		6.26	5.00	25.3	30.0
Perfluorooctane Sulfonate (PFOS)	Lin2		1.211		5.54	4.78	16.0	30.0
13C8 PFOA	Lin2		1.048		6.48	5.00	29.6	30.0
13C8 PFOS	Lin2		0.9947		6.13	4.78	28.2	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Lab Sample ID: CCV 280-177740/21 Calibration Date: 06/07/2013 13:30
 Instrument ID: LC_LCMS5 Calib Start Date: 04/17/2013 11:47
 GC Column: Gemini-NX ID: _____ Calib End Date: 04/17/2013 12:57
 Lab File ID: PC513F07024.d Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ammonium Perfluorooctanoate (APFO)	Lin2		0.9158		12.1	10.4	16.5	30.0
Perfluorooctanoic acid (PFOA)	Lin2		0.9530		11.6	10.0	16.5	30.0
Perfluorooctane Sulfonate (PFOS)	Lin2		1.154		10.6	9.56	11.1	30.0
13C8 PFOA	Lin2		0.9703		12.2	10.0	22.3	30.0
13C8 PFOS	Lin2		0.9230		11.5	9.56	20.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Lab Sample ID: CCV 280-177740/32 Calibration Date: 06/07/2013 15:07
 Instrument ID: LC_LCMS5 Calib Start Date: 04/17/2013 11:47
 GC Column: Gemini-NX ID: _____ Calib End Date: 04/17/2013 12:57
 Lab File ID: PC513F07035.d Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ammonium Perfluorooctanoate (APFO)	Lin2		0.9517		6.24	5.20	20.0	30.0
Perfluorooctanoic acid (PFOA)	Lin2		0.9903		6.00	5.00	20.0	30.0
Perfluorooctane Sulfonate (PFOS)	Lin2		1.257		5.75	4.78	20.4	30.0
13C8 PFOA	Lin2		1.049		6.49	5.00	29.7	30.0
13C8 PFOS	Lin2		0.9630		5.93	4.78	24.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Lab Sample ID: CCV 280-177740/35 Calibration Date: 06/07/2013 15:33
 Instrument ID: LC_LCMS5 Calib Start Date: 04/17/2013 11:47
 GC Column: Gemini-NX ID: _____ Calib End Date: 04/17/2013 12:57
 Lab File ID: PC513F07038.d Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ammonium Perfluorooctanoate (APFO)	Lin2		0.8983		11.9	10.4	14.2	30.0
Perfluorooctanoic acid (PFOA)	Lin2		0.9348		11.4	10.0	14.2	30.0
Perfluorooctane Sulfonate (PFOS)	Lin2		1.155		10.6	9.56	11.2	30.0
13C8 PFOA	Lin2		0.9448		11.9	10.0	19.0	30.0
13C8 PFOS	Lin2		0.9360		11.7	9.56	22.2	30.0

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Lab File ID: PC513F07014.d Lab Sample ID: MB 280-176976/1-A
 Matrix: Water Date Extracted: 06/03/2013 15:47
 Instrument ID: LC_LCMS5 Date Analyzed: 06/07/2013 12:03
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 280-176976/2-A	PC513F07015 .d	06/07/2013 12:12
NASB-EP-IN-0513	280-42839-1	PC513F07016 .d	06/07/2013 12:21
NASB-EP-EF-0513	280-42839-2	PC513F07017 .d	06/07/2013 12:29
NASB-EP-GW-EW05B-0513	280-42839-3	PC513F07018 .d	06/07/2013 12:38
NASB-EP-GW-MW1104-0513	280-42839-4	PC513F07019 .d	06/07/2013 12:47
NASB-EP-GW-MGBR-MW04-0513	280-42839-5	PC513F07020 .d	06/07/2013 12:56
NASB-EP-GW-MW323-0513	280-42839-6	PC513F07021 .d	06/07/2013 13:04
NASB-EP-GW-MWEP347-0513	280-42839-7	PC513F07022 .d	06/07/2013 13:13
NASB-EP-GW-DUP03-052913	280-42839-8	PC513F07023 .d	06/07/2013 13:22
NASB-EP-GW-MW335-0513	280-42839-9	PC513F07025 .d	06/07/2013 13:39
NASB-EP-GW-MW335-0513 MS	280-42839-9 MS	PC513F07026 .d	06/07/2013 13:48
NASB-EP-GW-MW335-0513 MSD	280-42839-9 MSD	PC513F07027 .d	06/07/2013 13:57
NASB-EP-GW-MWEP352-0513	280-42839-10	PC513F07028 .d	06/07/2013 14:05
NASB-EP-GW-MW334-0513	280-42839-11	PC513F07029 .d	06/07/2013 14:14
NASB-EP-GW-MWEP351-0513	280-42839-12	PC513F07030 .d	06/07/2013 14:23
NASB-EP-GW-DUP04-052913	280-42839-13	PC513F07031 .d	06/07/2013 14:32
NASB-EP-GW-RB02-053013	280-42839-14	PC513F07032 .d	06/07/2013 14:40
NASB-EP-GW-EW05B-0513 DL	280-42839-3 DL	PC513F07033 .d	06/07/2013 14:49
NASB-EP-GW-MW323-0513 DL	280-42839-6 DL	PC513F07034 .d	06/07/2013 14:58
NASB-EP-GW-MWEP347-0513 DL	280-42839-7 DL	PC513F07036 .d	06/07/2013 15:15
NASB-EP-GW-DUP04-052913 DL	280-42839-13 DL	PC513F07037 .d	06/07/2013 15:24

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 280-176976/1-A
 Matrix: Water Lab File ID: PC513F07014.d
 Analysis Method: PFOA/PFOS Date Collected: _____
 Extraction Method: 3535 Date Extracted: 06/03/2013 15:47
 Sample wt/vol: 250 (mL) Date Analyzed: 06/07/2013 12:03
 Con. Extract Vol.: 5 (mL) Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177740 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0080	U	0.020	0.0080	0.0045
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.020	U	0.030	0.020	0.0098

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	122		60-155
STL01054	13C8 PFOS	112		45-130

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: PC513F07015.d
 Lab ID: LCS 280-176976/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.200	0.236	118	70-130	
Perfluorooctane Sulfonate (PFOS)	0.191	0.198	104	60-128	

Column to be used to flag recovery and RPD values

FORM III PFOA/PFOS

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: PC513F07026.d
 Lab ID: 280-42839-9 MS Client ID: NASB-EP-GW-MW335-0513 MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.198	0.014 J	0.249	119	70-130	
Perfluorooctane Sulfonate (PFOS)	0.189	0.020 U	0.201	106	60-128	

NASB-EP-GW-MW335-0513

Column to be used to flag recovery and RPD values

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: PC513F07027.d
 Lab ID: 280-42839-9 MSD Client ID: NASB-EP-GW-MW335-0513 MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanoic acid (PFOA)	0.198	0.254	121	2	20	70-130	
Perfluorooctane Sulfonate (PFOS)	0.189	0.220	116	9	20	60-128	

Column to be used to flag recovery and RPD values

FORM III
LCMS DETECTION LIMIT CHECK STANDARD RECOVERY

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: PC513D17021c.d
 Lab ID: DLCK 280-171896/13 Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	DLCK CONCENTRATION (ug/L)	DLCK % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.500	0.570	114	70-130	
Perfluorooctane Sulfonate (PFOS)	0.478	0.546	114	70-130	

Column to be used to flag recovery and RPD values

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Denver

Job No.: 280-42839-1

SDG No.: _____

Matrix: Water

Level: Low

GC Column (1): Gemini-NX ID: _____

Client Sample ID	Lab Sample ID	PFOA #	PFOS #
NASB-EP-IN-0513	280-42839-1	125	119
NASB-EP-EF-0513	280-42839-2	125	115
NASB-EP-GW-EW05B-0 513	280-42839-3	123	115
NASB-EP-GW-EW05B-0 513 DL	280-42839-3 DL <i>10x</i>	117	D 124 D
NASB-EP-GW-MW1104- 0513	280-42839-4	122	113
NASB-EP-GW-MGBR-MW 04-0513	280-42839-5	124	113
NASB-EP-GW-MW323-0 513	280-42839-6	123	116
NASB-EP-GW-MW323-0 513 DL	280-42839-6 DL <i>10x</i>	134	D 118 D
NASB-EP-GW-MWEP347 -0513	280-42839-7	128	113
NASB-EP-GW-MWEP347 -0513 DL	280-42839-7 DL <i>10x</i>	123	D 125 D
NASB-EP-GW-DUP03-0 52913	280-42839-8	121	117
NASB-EP-GW-MW335-0 513	280-42839-9	123	116
NASB-EP-GW-MWEP352 -0513	280-42839-10	124	118
NASB-EP-GW-MW334-0 513	280-42839-11	124	117
NASB-EP-GW-MWEP351 -0513	280-42839-12	123	111
NASB-EP-GW-DUP04-0 52913	280-42839-13	125	117
NASB-EP-GW-DUP04-0 52913 DL	280-42839-13 DL <i>10x</i>	121	D 119 D
NASB-EP-GW-RB02-05 3013	280-42839-14	124	115
	MB 280-176976/1-A	122	112
	LCS 280-176976/2-A	125	117
NASB-EP-GW-MW335-0 513 MS	280-42839-9 MS	127	117
NASB-EP-GW-MW335-0 513 MSD	280-42839-9 MSD	127	115
	DLCK 280-171896/13	115	106

PFOA = 13C8 PFOA
PFOS = 13C8 PFOS

QC LIMITS
60-155
45-130

Column to be used to flag recovery values

FORM II PFOA/PFOS

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Instrument ID: LC_LCMS5 Calibration Start Date: 04/17/2013 11:47
 GC Column: Gemini-NX ID: _____ Calibration End Date: 04/17/2013 12:57
 Calibration ID: 13823

	OA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	14620870	4.11	4912015	4.27		
UPPER LIMIT	22662349	4.61	6385620	4.77		
LOWER LIMIT	8772522	3.61	2210407	3.77		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CGB 280-171896/11	15079298	4.09	4955303	4.25		
ICV 280-171896/12	13928665	4.10	4621037	4.26		
DLCK 280-171896/13	14477230	4.10	5194106	4.26		
CCV 280-177740/10	17805150	4.21	4345011	4.37		
MB 280-176976/1-A	15610932	4.21	3642608	4.37		
LCS 280-176976/2-A	15553388	4.20	4090958	4.36		
280-42839-1	NASB-EP-IN-0513	13066113	4.21	2828356	4.36	
280-42839-2	NASB-EP-EF-0513	13883061	4.20	3337563	4.35	
280-42839-3	NASB-EP-GW-EW05B-0513	7965806Q	4.20	3151472	4.35	
280-42839-4	NASB-EP-GW-MW1104-0513	15043347	4.20	3740615	4.35	
280-42839-5	NASB-EP-GW-MGBR-MW04-0513	14472368	4.19	3577070	4.34	
280-42839-6	NASB-EP-GW-MW323-0513	8408686Q	4.19	2899825	4.34	
280-42839-7	NASB-EP-GW-MWEP347-0513	6129569Q	4.19	2520948	4.34	
280-42839-8	NASB-EP-GW-DUP03-052913	13411788	4.18	3449028	4.33	
CCV 280-177740/21		16770563	4.18	4116891	4.33	
280-42839-9	NASB-EP-GW-MW335-0513	14638664	4.18	2647923	4.34	
280-42839-9 MS	NASB-EP-GW-MW335-0513 MS	12970664	4.17	2746510	4.32	
280-42839-9 MSD	NASB-EP-GW-MW335-0513 MSD	13725109	4.18	2488961	4.33	
280-42839-10	NASB-EP-GW-MWEP352-0513	13250014	4.17	3171304	4.32	
280-42839-11	NASB-EP-GW-MW334-0513	13765926	4.17	3268150	4.32	
280-42839-12	NASB-EP-GW-MWEP351-0513	13194263	4.16	3423730	4.32	
280-42839-13	NASB-EP-GW-DUP04-052913	7147513Q	4.18	2894158	4.33	
280-42839-14	NASB-EP-GW-RB02-053013	15569162	4.16	3858168	4.31	
280-42839-3 DL	NASB-EP-GW-EW05B-0513 DL	1463653Q	4.17	293752Q	4.32	OK
280-42839-6 DL	NASB-EP-GW-MW323-0513 DL	1527088Q	4.18	323443Q	4.33	

OA = 13C4 PFOA (IS)
 PFOS = 13C4 PFOS (IS)

Area Limit = 60%-155% of internal standard area
 RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII PFOA/PFOS

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 280-42839-1
 SDG No.: _____
 Instrument ID: LC_LCMS5 Calibration Start Date: 04/17/2013 11:47
 GC Column: Gemini-NX ID: _____ Calibration End Date: 04/17/2013 12:57
 Calibration ID: 13823

	OA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	14620870	4.11	4912015	4.27		
UPPER LIMIT	22662349	4.61	6385620	4.77		
LOWER LIMIT	8772522	3.61	2210407	3.77		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCV 280-177740/32		16644087	4.18	4254558	4.33	
280-42839-7 DL	NASB-EP-GW-MWEP347-05 13 DL	1446999Q	4.18	275898Q	4.33	
280-42839-13 DL	NASB-EP-GW-DUP04-0529 13 DL	1429445Q	4.19	317063Q	4.34	
CCV 280-177740/35		17273228	4.19	4039213	4.34	

OA = 13C4 PFOA (IS)
 PFOS = 13C4 PFOS (IS)

Area Limit = 60%-155% of internal standard area
 RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII PFOA/PFOS

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Denver

Job No.: 280-42839-1

SDG No.:

Batch Number: 176976

Batch Start Date: 06/03/13 15:47

Batch Analyst: Cokley, Cheyana D

Batch Method: 3535

Batch End Date: 06/03/13 18:10

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	Initial pH	PFOA/S_Spike 00006
MB 280-176976/1		3535, PFOA/PFOS				250 mL	5 mL	7 SU	
LCS 280-176976/2		3535, PFOA/PFOS				250 mL	5 mL	7 SU	0.1 mL
280-42839-B-1	NASB-EP-IN-0513	3535, PFOA/PFOS	T	268.72 g	21.64 g	247.1 mL	5 mL	7 SU	
280-42839-B-2	NASB-EP-EF-0513	3535, PFOA/PFOS	T	277.78 g	21.11 g	256.7 mL	5 mL	7 SU	
280-42839-B-3	NASB-EP-GW-EW05B -0513	3535, PFOA/PFOS	T	280.76 g	22.67 g	258.1 mL	5 mL	7 SU	
280-42839-A-4	NASB-EP-GW-MW110 4-0513	3535, PFOA/PFOS	T	273.02 g	22.23 g	250.8 mL	5 mL	7 SU	
280-42839-A-5	NASB-EP-GW-MGBR- MW04-0513	3535, PFOA/PFOS	T	272.56 g	21.42 g	251.1 mL	5 mL	7 SU	
280-42839-A-6	NASB-EP-GW-MW323 -0513	3535, PFOA/PFOS	T	278.86 g	21.27 g	257.6 mL	5 mL	7 SU	
280-42839-A-7	NASB-EP-GW-MWEP3 47-0513	3535, PFOA/PFOS	T	268.88 g	22.27 g	246.6 mL	5 mL	6 SU	
280-42839-A-8	NASB-EP-GW-DUP03 -052913	3535, PFOA/PFOS	T	272.33 g	22.02 g	250.3 mL	5 mL	7 SU	
280-42839-F-9	NASB-EP-GW-MW335 -0513	3535, PFOA/PFOS	T	276.07 g	21.02 g	255.1 mL	5 mL	7 SU	
280-42839-A-9 MS	NASB-EP-GW-MW335 -0513	3535, PFOA/PFOS	T	274.46 g	21.46 g	253 mL	5 mL	7 SU	0.1 mL
280-42839-B-9 MSD	NASB-EP-GW-MW335 -0513	3535, PFOA/PFOS	T	274.45 g	21.82 g	252.6 mL	5 mL	7 SU	0.1 mL
280-42839-B-10	NASB-EP-GW-MWEP3 52-0513	3535, PFOA/PFOS	T	273.87 g	21.47 g	252.4 mL	5 mL	5 SU	
280-42839-B-11	NASB-EP-GW-MW334 -0513	3535, PFOA/PFOS	T	271.87 g	21.74 g	250.1 mL	5 mL	7 SU	
280-42839-B-12	NASB-EP-GW-MWEP3 51-0513	3535, PFOA/PFOS	T	272.84 g	21.46 g	251.4 mL	5 mL	7 SU	
280-42839-B-13	NASB-EP-GW-DUP04 -052913	3535, PFOA/PFOS	T	272.02 g	24.07 g	248 mL	5 mL	7 SU	
280-42839-A-14	NASB-EP-GW-RB02- 053013	3535, PFOA/PFOS	T	272.20 g	22.65 g	249.6 mL	5 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	PFOA/S_Sur/IS 00005					
MB 280-176976/1		3535, PFOA/PFOS		0.1 mL					

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.

**NAS BRUNSWICK
WATER DATA
280-42839-1**

FRACTION	CHEMICAL	1SB-EP-GW-DUP03-0529	UNITS	1SB-EP-GW-MW1104-05	RPD	D
MISC	PENTADECAFLUOROOCTANOIC ACID	0.6	UG/L	0.59	1.68	0.01
MISC	PERFLUOROOCTANE SULFONIC ACID	0.019 J	UG/L	0.017 J	11.11	0.00

Current RPD Quality Control Limit: 30 %.

Shaded cells indicate RPDs that exceed the applicable quality control limit.

**NAS BRUNSWICK
WATER DATA
280-42839-1**

FRACTION	CHEMICAL	1SB-EP-GW-DUP04-0529	UNITS	SB-EP-GW-MWEP347-0	RPD	D
MISC	PENTADECAFLUOROOCTANOIC ACID	10 J	UG/L	11 J	9.52	1.00
MISC	PERFLUOROOCTANE SULFONIC ACID	0.096	UG/L	0.094	2.11	0.00

Current RPD Quality Control Limit: 30 %.

Shaded cells indicate RPDs that exceed the applicable quality control limit.

**NAS BRUNSWICK
SDG 280-42839-1**

NASB-EP-GW-EW05B-0513

PFOS

X-VALUE

0.0191
0.0478
0.0956
0.191
0.478
0.956
1.91
4.78
11.95

Y-VALUE

0.0255
0.06338
0.12092
0.23322
0.5199
1.05
1.94355
4.9406
11.1531

CORREL

**0.9991762
Y-INTERC
0.099122384**

SLOPE

0.93785674

PFOS (µg/L)

37.75499463

3.64

EXTRACTION

258.1 ml
5 ml

Final Concentration PFOS (µg/L)

0.731402453

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\Denchrom\chromdata\LC_LCMS5\20130607-12370.b\PC513F07018.d
 Lims ID: 280-42839-B-3-A Client ID: NASB-EP-GW-EW05B-0513
 Inject. Date: 07-Jun-2013 12:38:30 Dil. Factor: 1.0000
 Sample Type: Client
 Sample ID: 280-42839-B-3-A, Sample
 Misc. Info.:
 Operator: TW/MPK/ACM Instrument ID: LC_LCMS5
 Injection Vol: 20.0 ul ALS Bottle#: 0
 Lims Batch ID: 177740 Lims Sample ID: 15
 Raw Data: Smoothed
 Detector: MS QQQ
 Method: \\Denchrom\chromdata\LC_LCMS5\20130607-12370.b\8321_PFOA_S.m
 Last Update: 11-Jun-2013 07:03:15 Calib Date: 17-Apr-2013 12:57:11
 Quant Method: Internal/External Standard Quant By: Initial Calibration
 Last Cal File: \\Denchrom\chromdata\LC_LCMS5\20130430-11114.b\PC513D17018c.d
 Limit Group: LC - PFOA
 Integrator: Falcon
 Column Type: Column Dia:
 Process Host: DENPC328

Signal	RT	EXP RT	DLT RT	REL RT	Response	On-Col Amt ug/L	Ratio Range	Ratio	Flags
\$ 9 13C8 PFOA	421.0 > 375.9	4.199	4.208	-0.009	1.000	7754274	12.3		
* 4 13C4 PFOA (IS)	417.0 > 371.9	4.200	4.209	-0.009		7965806	10.0		
1 Perfluorooctanoic acid									E
413.0 > 368.9	4.201	4.210	-0.009	1.000	334374440	517.5	0.70- 1.30	1.00	E
413.0 > 169.0	4.192	4.210	-0.018	0.998	79497265		2.84- 5.27	4.21	
\$ 6 13C8 PFOS	506.9 > 80.0	4.347	4.364	-0.017	1.000	2767891	10.9		
* 5 13C4 PFOS (IS)	502.9 > 80.0	4.347	4.365	-0.018		<u>3151472</u>	9.56		
2 Perfluorooctanoic Sulfonate									
498.9 > 79.9	4.330	4.357	-0.027	0.996	<u>11484492</u>	33.7	0.70- 1.30	1.00	4
498.9 > 98.9	4.348	4.357	-0.009	1.000	2612963		2.06- 3.82	4.40	

QC Flag Legend

Processing Flags

4 - Failed Signal Ratio Test

E - Exceeded Maximum Amount

= 3.6442

extraction $\frac{258.1 \text{ ml}}{5 \text{ ml}}$

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\Denchrom\chromdata\LC_LCMS5\20130607-12370.b\PC513F07033.d
 Lims ID: 280-42839-B-3-A Client ID: NASB-EP-GW-EW05B-0513
 Inject. Date: 07-Jun-2013 14:49:31 Dil. Factor: 1.0000
 Sample Type: Client
 Sample ID: 280-42839-B-3-A 10x, Sample
 Misc. Info.: 10x
 Operator: TW/MPK/ACM Instrument ID: LC_LCMS5
 Injection Vol: 20.0 ul ALS Bottle#: 0
 Lims Batch ID: 177740 Lims Sample ID: 30
 Raw Data: Smoothed
 Detector: MS QQQ
 Method: \\Denchrom\chromdata\LC_LCMS5\20130607-12370.b\8321_PFOA_S.m
 Last Update: 11-Jun-2013 07:03:21 Calib Date: 17-Apr-2013 12:57:11
 Quant Method: Internal/External Standard Quant By: Initial Calibration
 Last ICal File: \\Denchrom\chromdata\LC_LCMS5\20130430-11114.b\PC513D17018c.d
 Limit Group: LC - PFOA
 Integrator: Falcon
 Column Type: Column Dia:
 Process Host: DENPC328

First Level Reviewer: meyera Date: 11-Jun-2013 07:00:12

Signal	RT	EXP RT	DLT RT	REL RT	Response	On-Col Amt ug/L	Ratio Range	Ratio	Flags
\$ 9 13C8 PFOA									
421.0 > 375.9	4.181	4.181	0.000	1.002	1362988	11.7			
* 4 13C4 PFOA (IS)									sM
417.0 > 371.9	4.173	4.182	-0.009		1463653	10.0			M
1 Perfluorooctanoic acid									E
413.0 > 368.9	4.174	4.183	-0.009	1.000	55691877	469.1	0.70- 1.30	1.00	E
413.0 > 169.0	4.174	4.183	-0.009	1.000	13336214		2.84- 5.27	4.18	
\$ 6 13C8 PFOS									
506.9 > 80.0	4.320	4.329	-0.009	1.000	279383	11.9			
* 5 13C4 PFOS (IS)									sM
502.9 > 80.0	4.321	4.330	-0.009		293752	9.56			M
2 Perfluorooctanoic Sulfonate									
498.9 > 79.9	4.304	4.330	-0.026	0.996	1052489	33.1	0.70- 1.30	1.00	4
498.9 > 98.9	4.322	4.330	-0.008	1.000	255147		2.06- 3.82	4.13	

QC Flag Legend

Processing Flags
 4 - Failed Signal Ratio Test
 E - Exceeded Maximum Amount
 s - Failed ISTD Recovery Test

Review Flags
 M - Manually Integrated

DODCMD_ID	INSTALLATION_ID	SDG	SITE_NAME	NORM_SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE	ANALYTICAL_METHOD	ANALYTICAL_METHOD_GRP_DESC
MID_ATLANTIC	BRUNSWICK_NAS	280-42839-1	EAST PLUME	SITE 00011	MW-EP-347	Monitoring well	3016949.187	383436.915	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-EP-GW-MWEP347-0513	Ground water	Normal (Regular)	30-May-13	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-42839-1	EAST PLUME	SITE 00011	NASB-EP-EF	System effluent	3015831.27	384870.5431	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-EP-EF-0513	Ground water	Normal (Regular)	29-May-13	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-42839-1	EAST PLUME	SITE 00011	EW-05B	Monitoring well	3017160.96	383821.81	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-EP-GW-EW05B-0513	Ground water	Normal (Regular)	29-May-13	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-42839-1	EAST PLUME	SITE 00011	MW-334	Monitoring well	3016402.86	381461.48	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-EP-GW-MW334-0513	Ground water	Normal (Regular)	30-May-13	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-42839-1							N6246704D0055	432	TETRA TECH NUS, INC.	NASB-EP-GW-RB02-05302013	Water for QC samples	Equipment blank	30-May-13	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-42839-1	MRP MGBR		NASB-MGBR-MW04	Monitoring well	3015769.892	385204.3634	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-EP-GW-MGBR-MW04-0513	Ground water	Normal (Regular)	29-May-13	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-42839-1	EAST PLUME	SITE 00011	MW-1104	Monitoring well	3016166.85	384527.13	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-EP-GW-MW1104-0513-D	Ground water	Field duplicate	29-May-13	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-42839-1	EAST PLUME	SITE 00011	MW-EP-347	Monitoring well	3016949.187	383436.915	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-EP-GW-MWEP347-0513-D	Ground water	Field duplicate	29-May-13	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-42839-1	EAST PLUME	SITE 00011	MW-EP-351	Monitoring well	3016886.588	382199.5741	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-EP-GW-MWEP351-0513	Ground water	Normal (Regular)	30-May-13	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-42839-1	EAST PLUME	SITE 00011	MW-EP-352	Monitoring well	3016775.726	381885.5663	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-EP-GW-MWEP352-0513	Ground water	Normal (Regular)	30-May-13	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-42839-1	EAST PLUME	SITE 00011	MW-335	Monitoring well	3015644.39	381480.83	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-EP-GW-MW335-0513	Ground water	Normal (Regular)	30-May-13	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-42839-1	EAST PLUME	SITE 00011	MW-1104	Monitoring well	3016166.85	384527.13	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-EP-GW-MW1104-0513	Ground water	Normal (Regular)	29-May-13	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-42839-1	EAST PLUME	SITE 00011	MW-323	Monitoring well	3016289.9	384615.74	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-EP-GW-MW323-0513	Ground water	Normal (Regular)	29-May-13	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-42839-1	EAST PLUME	SITE 00011	NASB-EP-IN	System influent	3015855.381	384847.8125	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-EP-IN-0513	Ground water	Normal (Regular)	30-May-13	TA_WS-LC-0025	Perfluoroalkyl Compounds