

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

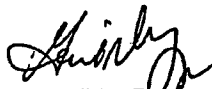
PFOA/PFOS Analysis

Lot #: D7J040207

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TestAmerica Denver



Gail DeRuzzo
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October 22, 2007

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Standard Deliverables

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Case Narrative

D7J040207

The results included in this report have been reviewed for compliance with the Laboratory Quality Manual. All results have been found to meet all requirements of NELAC and any exceptions are noted below.

This report shall not be reproduced except in full, without the written approval of the laboratory or sponsor. Dilution factors and footnotes have been provided on each datasheet to assist in the interpretation of the results.

Sample Arrival and Receipt

The three water samples presented in this report were received at the TestAmerica Denver laboratory at a temperature of 4.6°C on October 4, 2007.

Standards

Analytical standards were prepared using the acid form of the compound perfluorooctanoic acid (PFOA). PFOS is a commercial prepared and certified solution.

Perfluoro-n-[1,2,3,4-¹³C₄]octanoic acid was introduced at the extraction step and was used as an internal standard for quantitation of PFOA. Perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate was introduced at the extraction step and was used as an internal standard for quantitation of PFOS.

Sample Extraction and Analysis

The samples presented in this report were analyzed for the target analytes by TestAmerica Denver's SOP DEN-LC-0012.

For water samples a 250 mL aliquot of each sample is acidified with 1 mL of 6N HCl solution and it is extracted using solid phase extraction technique with methanol conditioned C18 cartridges. Each sample is spiked with the internal standard, prior to extraction. After the sample is passed through the cartridge, the analytes are eluted with 4 mL of methanol. The final volume is brought to 5 mL using methanol and the extract is analyzed by LC/MS/MS.

Method QC Samples

The Method Blank is processed reagent water spiked with surrogate and prepared with each batch of 20 samples of the same matrix. The method blanks were non-detect at the reporting limit for the target analytes.

Each batch is prepared with Laboratory Control Samples (LCS). The LCS recoveries for both levels were within established control limits, except as noted below.

Analytical Comments

The mid-level LCS recovery for PFOA in QC batch 7282110 was below the lower control limit. Therefore the samples were re-extracted in QC batch 7286156 after the 7 day holding time that is used for water samples by the laboratory for this method. The LCS recoveries for both levels were in control in the re-extraction batch. Both sets of results are reported.

It should be noted that there is no promulgated holding time for this method.

There was insufficient sample volume to provide MS/MSD analysis in either analytical batch. However, two laboratory control samples were prepared in each batch to provide an indication that the analytical system was in control.

No other anomalies were noted.

NJAW000!

EXECUTIVE SUMMARY - Detection Highlights

D7J040207

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
BIRCH CREEK POB 10/02/07 09:15 002				
PFOA	0.016	0.015	ug/L	DEN -LC-0012
PFOA	0.018	0.015	ug/L	DEN -LC-0012
DRRWTP POB 10/02/07 13:15 003				
PFOS	0.0034 J	0.010	ug/L	DEN -LC-0012
PFOA	0.0076 J	0.015	ug/L	DEN -LC-0012
PFOS	0.0085 J	0.010	ug/L	DEN -LC-0012
PFOA	0.0089 J	0.015	ug/L	DEN -LC-0012

NJAW00058

METHODS SUMMARY

D7J040207

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>	<u>PREPARATION METHOD</u>
LC/MS/MS, PFOA	DEN -LC-0012	

References:

DEN Severn Trent Laboratores, Denver, Facility Standard
Operating Procedure.

NJAW0005

METHOD / ANALYST SUMMARY

D7J040207

<u>ANALYTICAL METHOD</u>	<u>ANALYST</u>	<u>ANALYST ID</u>
DEN -LC-0012	Jaqueline Bonnett	003601

References:

DEN Severn Trent Laboratores, Denver, Facility Standard
Operating Procedure.

SAMPLE SUMMARY

D7J040207

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
J78XN	001	BECKETT POE	10/02/07	08:20
J78XT	002	BIRCH CREEK POE	10/02/07	09:15
J78X0	003	DRRWTP POE	10/02/07	13:15

NOTE(S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

NJAW0005

American Water Company

Client Sample ID: BECKETT POB

HPLC

Lot-Sample #...: D7J040207-001 Work Order #...: J78XN1AA Matrix.....: WATER
 Date Sampled...: 10/02/07 08:20 Date Received...: 10/04/07
 Prep Date.....: 10/09/07 Analysis Date...: 10/11/07
 Prep Batch #...: 7282110 Analysis Time...: 02:41
 Dilution Factor: 1

Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
PFOS	ND	0.010	ug/L	0.0020
PFOA	ND	0.015	ug/L	0.0031

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
13C4 PFOA	71	(50 - 200)
13C4 PFOS	57	(50 - 200)

American Water Company

Client Sample ID: BECKETT POE

HPLC

Lot-Sample #....: D7J040207-001 Work Order #....: J78XN2AA Matrix.....: WATER
 Date Sampled....: 10/02/07 08:20 Date Received...: 10/04/07
 Prep Date.....: 10/13/07 Analysis Date...: 10/15/07
 Prep Batch #....: 7286156 Analysis Time...: 02:11
 Dilution Factor: 1 Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
PFOS	ND	0.010	ug/L	0.0020
PFOA	ND	0.015	ug/L	0.0031

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	71	(50 - 200)
13C4 PFOS	58	(50 - 200)

American Water Company

Client Sample ID: BIRCH CREEK POB

HPLC

Lot-Sample #...: D7J040207-002 Work Order #...: J78XT1AA Matrix.....: WATER
Date Sampled...: 10/02/07 09:15 Date Received...: 10/04/07
Prep Date.....: 10/09/07 Analysis Date...: 10/11/07
Prep Batch #...: 7282110 Analysis Time...: 02:57
Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
PFOS	ND	0.010	ug/L	0.0020
PFOA	0.016	0.015	ug/L	0.0031

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	74	(50 - 200)
13C4 PFOS	57	(50 - 200)

American Water Company

Client Sample ID: BIRCH CREEK POE

HPLC

Lot-Sample #....: D7J040207-002 Work Order #....: J78XT2AA Matrix.....: WATER
 Date Sampled....: 10/02/07 09:15 Date Received...: 10/04/07
 Prep Date.....: 10/13/07 Analysis Date...: 10/15/07
 Prep Batch #....: 7286156 Analysis Time...: 02:27
 Dilution Factor: 1 Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
PFOS	ND	0.010	ug/L	0.0020
PFOA	0.018	0.015	ug/L	0.0031

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
13C4 PFOA	79	(50 - 200)
13C4 PFOS	61	(50 - 200)

American Water Company

Client Sample ID: DRRWTP POE

HPLC

Lot-Sample #....: D7J040207-003 Work Order #....: J78X01AA Matrix.....: WATER
Date Sampled....: 10/02/07 13:15 Date Received...: 10/04/07
Prep Date.....: 10/09/07 Analysis Date...: 10/11/07
Prep Batch #....: 7282110 Analysis Time...: 03:13
Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING		UNITS	MDL
		LIMIT			
PFOS	0.0034 J	0.010		ug/L	0.0020
PFOA	0.0076 J	0.015		ug/L	0.0031
SURROGATE	PERCENT		RECOVERY		
	RECOVERY		LIMITS		
13C4 PFOA	70		(50 - 200)		
13C4 PFOS	60		(50 - 200)		

NOTE(S):

J Estimated result. Result is less than RL.

American Water Company

Client Sample ID: DRRWTP POE

HPLC

Lot-Sample #...: D7J040207-003 Work Order #...: J78X02AA Matrix.....: WATER
 Date Sampled...: 10/02/07 13:15 Date Received...: 10/04/07
 Prep Date.....: 10/13/07 Analysis Date...: 10/15/07
 Prep Batch #...: 7286156 Analysis Time...: 02:43
 Dilution Factor: 1 Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
PFOS	0.0085 J	0.010	ug/L	0.0020
PFOA	0.0089 J	0.015	ug/L	0.0031
SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS		
13C4 PFOA	75	(50 - 200)		
13C4 PFOS	66	(50 - 200)		

NOTE(S) :

J Estimated result. Result is less than RL.

QC DATA ASSOCIATION SUMMARY

D7J040207

Sample Preparation and Analysis Control Numbers

<u>SAMPLE#</u>	<u>MATRIX</u>	<u>ANALYTICAL METHOD</u>	<u>LEACH BATCH #</u>	<u>PREP BATCH #</u>	<u>MS RUN#</u>
001	WATER	DEN -LC-0012		7282110	
	WATER	DEN -LC-0012		7286156	
002	WATER	DEN -LC-0012		7282110	
	WATER	DEN -LC-0012		7286156	
003	WATER	DEN -LC-0012		7282110	
	WATER	DEN -LC-0012		7286156	

NJAW0005

METHOD BLANK REPORT

HPLC

Client Lot #...: D7J040207
 MB Lot-Sample #: R7J090000-110
 Analysis Date...: 10/11/07
 Dilution Factor: 1

Work Order #...: J8G7T1AA
 Prep Date.....: 10/09/07
 Prep Batch #...: 7282110

Matrix.....: WATER
 Analysis Time...: 01:53

PARAMETER	RESULT	REPORTING		METHOD
		LIMIT	UNITS	
PFOA	ND	0.015	ug/L	DEN -LC-0012
PFOS	ND	0.010	ug/L	DEN -LC-0012
SURROGATE	PERCENT		RECOVERY	
	RECOVERY		LIMITS	
13C4 PFOA	69		(50 - 200)	
13C4 PFOS	57		(50 - 200)	

NOTE (S) :

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

NJAW000!

METHOD BLANK REPORT

HPLC

Client Lot #...: D7J040207
 MB Lot-Sample #: R7J130000-156
 Analysis Date...: 10/15/07
 Dilution Factor: 1

Work Order #...: J8X651AA
 Prep Date.....: 10/13/07
 Prep Batch #...: 7286156

Matrix.....: WATER
 Analysis Time...: 00:19

PARAMETER	RESULT	REPORTING		METHOD
		LIMIT	UNITS	
PFOA	ND	0.015	ug/L	DEN -LC-0012
PFOS	ND	0.010	ug/L	DEN -LC-0012
SURROGATE	PERCENT	RECOVERY		
	RECOVERY	LIMITS		
13C4 PFOA	82	(50 - 200)		
13C4 PFOS	75	(50 - 200)		

NOTE(S):

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

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LABORATORY CONTROL SAMPLE EVALUATION REPORT

HPLC

Client Lot #...: D7J040207 Work Order #...: J8G7T1AC Matrix.....: WATER
 LCS Lot-Sample#: R7J090000-110
 Prep Date.....: 10/09/07 Analysis Date...: 10/11/07
 Prep Batch #...: 7282110 Analysis Time...: 02:09
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT</u>	<u>RECOVERY</u>	<u>METHOD</u>
	<u>RECOVERY</u>	<u>LIMITS</u>	
PFOA	69 a	(70 - 130)	DEN -LC-0012
PFOS	56	(39 - 120)	DEN -LC-0012

<u>SURROGATE</u>	<u>PERCENT</u>	<u>RECOVERY</u>	<u>LIMITS</u>
	<u>RECOVERY</u>		
13C4 PFOA	71		(50 - 200)
13C4 PFOS	55		(50 - 200)

NOTE(S) :

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

Bold print denotes control parameters

a Spiked analyte recovery is outside stated control limits.

LABORATORY CONTROL SAMPLE DATA REPORT

HPLC

Client Lot #....: D7J040207
 LCS Lot-Sample#: R7J090000-110
 Prep Date.....: 10/09/07
 Prep Batch #....: 7282110
 Dilution Factor: 1

Work Order #....: J8G7T1AC
 Analysis Date...: 10/11/07
 Analysis Time...: 02:09

Matrix.....: WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
PFOA	0.200	0.138 a	ug/L	69	DEN -LC-0012
PFOS	0.200	0.112	ug/L	56	DEN -LC-0012
SURROGATE		PERCENT RECOVERY	RECOVERY LIMITS		
13C4 PFOA		71	(50 - 200)		
13C4 PFOS		55	(50 - 200)		

NOTE(S) :

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

Bold print denotes control parameters

a Spiked analyte recovery is outside stated control limits.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

HPLC

Client Lot #....: D7J040207 Work Order #....: J8G7T1AD Matrix.....: WATER
 LCS Lot-Sample#: R7J090000-110
 Prep Date.....: 10/09/07 Analysis Date...: 10/11/07
 Prep Batch #....: 7282110 Analysis Time...: 02:25
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
PFOA	70	(70 - 130)	DEN -LC-0012
PFOS	56	(39 - 120)	DEN -LC-0012
<u>SURROGATE</u>		<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
13C4 PFOA		69	(50 - 200)
13C4 PFOS		60	(50 - 200)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

NJAW0001

LABORATORY CONTROL SAMPLE DATA REPORT

HPLC

Client Lot #...: D7J040207 Work Order #...: J8G7T1AD Matrix.....: WATER
 LCS Lot-Sample#: R7J090000-110
 Prep Date.....: 10/09/07 Analysis Date...: 10/11/07
 Prep Batch #...: 7282110 Analysis Time...: 02:25
 Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
PFOA	0.0200	0.0140	ug/L	70	DEN -LC-0012
PFOS	0.0200	0.0112	ug/L	56	DEN -LC-0012

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	69	(50 - 200)
13C4 PFOS	60	(50 - 200)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

HPLC

Client Lot #....: D7J040207 Work Order #....: J8X651AC Matrix.....: WATER
 LCS Lot-Sample#: R7J130000-156
 Prep Date.....: 10/13/07 Analysis Date...: 10/15/07
 Prep Batch #....: 7286156 Analysis Time...: 00:35
 Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
PFOA	104	(70 - 130)	DEN -LC-0012
PFOS	99	(39 - 120)	DEN -LC-0012

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	76	(50 - 200)
13C4 PFOS	66	(50 - 200)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

HPLC

Client Lot #....: D7J040207 Work Order #....: J8X651AC Matrix.....: WATER
 LCS Lot-Sample#: R7J130000-156
 Prep Date.....: 10/13/07 Analysis Date...: 10/15/07
 Prep Batch #....: 7286156 Analysis Time...: 00:35
 Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
PFOA	0.200	0.209	ug/L	104	DEN -LC-0012
PFOS	0.200	0.198	ug/L	99	DEN -LC-0012

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	76	(50 - 200)
13C4 PFOS	66	(50 - 200)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

HPLC

Client Lot #....: D7J040207 Work Order #....: J8X651AD Matrix.....: WATER
 LCS Lot-Sample#: R7J130000-156
 Prep Date.....: 10/13/07 Analysis Date...: 10/15/07
 Prep Batch #....: 7286156 Analysis Time...: 00:51
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
PFOA	127	(70 - 130)	DEN -LC-0012
PFOS	110	(39 - 120)	DEN -LC-0012

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
13C4 PFOA	80	(50 - 200)
13C4 PFOS	78	(50 - 200)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

HPLC

Client Lot #....: D7J040207 Work Order #....: J8X651AD Matrix.....: WATER
 LCS Lot-Sample#: R7J130000-156
 Prep Date.....: 10/13/07 Analysis Date...: 10/15/07
 Prep Batch #....: 7286156 Analysis Time...: 00:51
 Dilution Factor: 1

<u>PARAMETER</u>	<u>SPIKE</u> <u>AMOUNT</u>	<u>MEASURED</u> <u>AMOUNT</u>	<u>UNITS</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>METHOD</u>
PFOA	0.0200	0.0255	ug/L	127	DEN -LC-0012
PFOS	0.0200	0.0220	ug/L	110	DEN -LC-0012

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
13C4 PFOA	80	(50 - 200)
13C4 PFOS	78	(50 - 200)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

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16/4/2024

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