TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-57527-2
Client Project/Site: FCCP APS Four Corners

For:
AECOM Technical Services Inc.
7720 North 16th Street
Suite 100
Phoenix, Arizona 85020

Attn: Dan Sola

Authorized for release by:
12/11/2015 3:38:08 PM

John McFadden, Project Manager I
(330)497-9396
john.mcfadden@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at:
www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page 1
Table of Contents 2
Definitions/Glossary 3
Case Narrative 4
Method Summary 6
Sample Summary 7
Client Sample Results 8
Tracer Carrier Summary 11
QC Sample Results 12
QC Association Summary 14
Lab Chronicle 15
Certification Summary 16
Chain of Custody 18

Definitions/Glossary

Client: AECOM Technical Services Inc.
Project/Site: FCCP APS Four Corners

TestAmerica Job ID: 240-57527-2

Qualifiers

Rad

Qualifier	Qualifier Description
X	Carrier is outside acceptance limits.
U	Result is less than the sample detection limit.

Glossary

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

Job ID: 240-57527-2

Laboratory: TestAmerica Canton

Narrative

CASE NARRATIVE

Client: AECOM Technical Services Inc.

Project: FCCP APS Four Corners

Report Number: 240-57527-2

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.

The 903.0 Radium-226, the 904.0 Radium-228 and the Ra226_Ra228 Combined Radium 226 and Radium 228 analyses were performed at the TestAmerica St. Louis laboratory.

TestAmerica Canton attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

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.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT
The samples were received on 11/5/2015 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.7º C.

RADIUM-226
Samples FC-CCR-MW69-110415 (240-57527-1), FC-CCR-MW67-110415 (240-57527-2) and FC-CCR-MW63-110415 (240-57527-3) were analyzed for Radium-226 in accordance with EPA Method 903.0. The samples were prepared on 11/09/2015 and analyzed on 12/01/2015.

Radium-226 Prep Batch 160-221012: The following sample has a barium carrier recovery above the 110% QC limit due to matrix interferences (see prep NCM 72639); (240-57527-E-1-1; 131%). The LCS (laboratory control sample) has an acceptable spike recovery demonstrating acceptable sample preparation and instrument performance. The samples associated with the batch have been truncated to 100% to reduce any potential bias a high carrier recovery may have. The data have been qualified and reported. FC-CCR-MW69-110415 (240-57527-1), FC-CCR-MW67-110415 (240-57527-2), FC-CCR-MW63-110415 (240-57527-3), (LCS 160-221012/2-A), (LCSD 160-221012/3-A) and (MB 160-221012/1-A).

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

Job ID: 240-57527-2 (Continued)

Laboratory: TestAmerica Canton (Continued)

RADIUM-228

Samples FC-CCR-MW69-110415 (240-57527-1), FC-CCR-MW67-110415 (240-57527-2) and FC-CCR-MW63-110415 (240-57527-3) were analyzed for Radium-228 in accordance with EPA Method 904.0. The samples were prepared on 11/09/2015 and analyzed on 11/16/2015.

Radium-228 Prep Batch 160-221016: The following sample has a barium carrier recovery above the 110% QC limit; 240-57527-E-1-B: 131% (see prep NCM 160-72639) The LCS/LCSD (laboratory control sample/laboratory control sample duplicate) have acceptable spike recoveries demonstrating acceptable sample preparation and instrument performance. The samples associated with the batch have been truncated to 100% to reduce any potential bias a high carrier recovery may have. The data have been qualified and reported. FC-CCR-MW69-110415 (240-57527-1), FC-CCR-MW67-110415 (240-57527-2), FC-CCR-MW63-110415 (240-57527-3), (LCS 160-221016/2-A), (LCSD 160-221016/3-A) and (MB 160-221016/1-A).

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

COMBINED RADIUM 226 AND RADIUM 228

Samples FC-CCR-MW69-110415 (240-57527-1), FC-CCR-MW67-110415 (240-57527-2) and FC-CCR-MW63-110415 (240-57527-3) were analyzed for Combined Radium 226 and Radium 228 in accordance with TAL-STL Method Ra226_RA228. The samples were analyzed on 12/02/2015.

Radium-226 Prep Batch 160-221012 and Radium-228 Prep Batch 160-221016: The barium carrier recovery is outside the upper control limit (110%) for sample FC-CCR-MW69-110415 (240-57527-1), recovering at 130%. The QC samples associated with the batch have acceptable carrier recovery indicating the presence of matrix interference.

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

Method Summary

Client: AECOM Technical Services Inc.
Project/Site: FCCP APS Four Corners

TestAmerica Job ID: 240-57527-2

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: AECOM Technical Services Inc.
Project/Site: FCCP APS Four Corners

TestAmerica Job ID: 240-57527-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-57527-1	FC-CCR-MW69-110415	Water	11/04/15 10:15	11/05/15 09:30
240-57527-2	FC-CCR-MW67-110415	Water	11/04/15 12:20	11/05/15 09:30
240-57527-3	FC-CCR-MW63-110415	Water	11/04/15 14:15	11/05/15 09:30

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: FCCP APS Four Corners

TestAmerica Job ID: 240-57527-2

Client Sample ID: FC-CCR-MW69-110415

Lab Sample ID: 240-57527-1

Date Collected: 11/04/15 10:15
Matrix: Water
Date Received: 11/05/15 09:30

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.29		0.153	0.192	0.0867	pCi/L	11/09/15 15:01	12/01/15 17:03	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*131*	*X*	*40 - 110*	*11/09/15 15:01*	*12/01/15 17:03*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.88		0.343	0.385	0.374	pCi/L	11/09/15 15:41	11/16/15 11:51	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*131*	*X*	*40 - 110*	*11/09/15 15:41*	*11/16/15 11:51*	*1*
Y Carrier	*96.1*		*40 - 110*	*11/09/15 15:41*	*11/16/15 11:51*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	3.17		0.376	0.430	0.374	pCi/L		12/02/15 20:01	1

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: FCCP APS Four Corners

TestAmerica Job ID: 240-57527-2

Client Sample ID: FC-CCR-MW67-110415

Lab Sample ID: 240-57527-2

Date Collected: 11/04/15 12:20
Matrix: Water
Date Received: 11/05/15 09:30

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.846		0.120	0.142	0.0714	pCi/L	11/09/15 15:01	12/01/15 17:03	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.8*		*40 - 110*	*11/09/15 15:01*	*12/01/15 17:03*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.83		0.334	0.374	0.341	pCi/L	11/09/15 15:41	11/16/15 11:51	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.8*		*40 - 110*	*11/09/15 15:41*	*11/16/15 11:51*	*1*
Y Carrier	*95.0*		*40 - 110*	*11/09/15 15:41*	*11/16/15 11:51*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	2.676		0.355	0.400	0.341	pCi/L		12/02/15 20:01	1

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: FCCP APS Four Corners

TestAmerica Job ID: 240-57527-2

Client Sample ID: FC-CCR-MW63-110415

Lab Sample ID: 240-57527-3

Date Collected: 11/04/15 14:15
Matrix: Water
Date Received: 11/05/15 09:30

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.408		0.0872	0.0946	0.0660	pCi/L	11/09/15 15:01	12/01/15 17:03	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.8*		*40 - 110*	*11/09/15 15:01*	*12/01/15 17:03*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.890		0.314	0.324	0.439	pCi/L	11/09/15 15:41	11/16/15 11:51	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.8*		*40 - 110*	*11/09/15 15:41*	*11/16/15 11:51*	*1*
Y Carrier	*98.3*		*40 - 110*	*11/09/15 15:41*	*11/16/15 11:51*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.298		0.326	0.338	0.439	pCi/L		12/02/15 20:01	1

Tracer/Carrier Summary

Client: AECOM Technical Services Inc.
Project/Site: FCCP APS Four Corners

TestAmerica Job ID: 240-57527-2

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)							
Lab Sample ID	**Client Sample ID**	**Ba (40-110)**							
240-57527-1	FC-CCR-MW69-110415	131 X							
240-57527-2	FC-CCR-MW67-110415	96.8							
240-57527-3	FC-CCR-MW63-110415	93.8							
LCS 160-221012/2-A	Lab Control Sample	94.7							
LCSD 160-221012/3-A	Lab Control Sample Dup	92.0							
MB 160-221012/1-A	Method Blank	92.9							

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)							
Lab Sample ID	**Client Sample ID**	**Ba (40-110)**	**Y (40-110)**						
240-57527-1	FC-CCR-MW69-110415	131 X	96.1						
240-57527-2	FC-CCR-MW67-110415	96.8	95.0						
240-57527-3	FC-CCR-MW63-110415	93.8	98.3						
LCS 160-221016/2-A	Lab Control Sample	94.7	98.7						
LCSD 160-221016/3-A	Lab Control Sample Dup	92.0	93.8						
MB 160-221016/1-A	Method Blank	92.9	87.9						

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-221012/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 224986 — **Prep Batch: 221012**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.02122	U	0.0424	0.0424	0.0741	pCi/L	11/09/15 15:01	12/01/15 17:04	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.9*		*40 - 110*	*11/09/15 15:01*	*12/01/15 17:04*	*1*

Lab Sample ID: LCS 160-221012/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 224986 — **Prep Batch: 221012**

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)		MDC	Unit	%Rec	%Rec. Limits		
Radium-226			11.2	11.97		1.15		0.0699	pCi/L	107	68 - 137		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*94.7*		*40 - 110*

Lab Sample ID: LCSD 160-221012/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 224986 — **Prep Batch: 221012**

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)		MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226			11.2	13.44		1.29		0.0703	pCi/L	120	68 - 137	0.60	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*92.0*		*40 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-221016/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222255 — **Prep Batch: 221016**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.06367	U	0.243	0.243	0.422	pCi/L	11/09/15 15:41	11/16/15 11:51	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.9*		*40 - 110*	*11/09/15 15:41*	*11/16/15 11:51*	*1*
Y Carrier	*87.9*		*40 - 110*	*11/09/15 15:41*	*11/16/15 11:51*	*1*

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-221016/2-A
Matrix: Water
Analysis Batch: 222255

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 221016

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)		MDC	Unit	%Rec	%Rec. Limits		
Radium-228			3.22	2.653		0.440		0.345	pCi/L	82	56 - 140		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*94.7*		*40 - 110*
Y Carrier	*98.7*		*40 - 110*

Lab Sample ID: LCSD 160-221016/3-A
Matrix: Water
Analysis Batch: 222255

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 221016

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)		MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228			3.22	3.047		0.488		0.360	pCi/L	95	56 - 140	0.42	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*92.0*		*40 - 110*
Y Carrier	*93.8*		*40 - 110*

QC Association Summary

Client: AECOM Technical Services Inc.
Project/Site: FCCP APS Four Corners

TestAmerica Job ID: 240-57527-2

Rad

Prep Batch: 221012

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-57527-1	FC-CCR-MW69-110415	Total/NA	Water	PrecSep-21	
240-57527-2	FC-CCR-MW67-110415	Total/NA	Water	PrecSep-21	
240-57527-3	FC-CCR-MW63-110415	Total/NA	Water	PrecSep-21	
LCS 160-221012/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-221012/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	
MB 160-221012/1-A	Method Blank	Total/NA	Water	PrecSep-21	

Prep Batch: 221016

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-57527-1	FC-CCR-MW69-110415	Total/NA	Water	PrecSep_0	
240-57527-2	FC-CCR-MW67-110415	Total/NA	Water	PrecSep_0	
240-57527-3	FC-CCR-MW63-110415	Total/NA	Water	PrecSep_0	
LCS 160-221016/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-221016/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	
MB 160-221016/1-A	Method Blank	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: FCCP APS Four Corners

TestAmerica Job ID: 240-57527-2

Client Sample ID: FC-CCR-MW69-110415 — Lab Sample ID: 240-57527-1

Date Collected: 11/04/15 10:15 — **Matrix: Water**
Date Received: 11/05/15 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			221012	11/09/15 15:01	MMS	TAL SL
Total/NA	Analysis	903.0		1	224986	12/01/15 17:03	RTM	TAL SL
Total/NA	Prep	PrecSep_0			221016	11/09/15 15:41	MMS	TAL SL
Total/NA	Analysis	904.0		1	222255	11/16/15 11:51	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	225215	12/02/15 20:01	RTM	TAL SL

Client Sample ID: FC-CCR-MW67-110415 — Lab Sample ID: 240-57527-2

Date Collected: 11/04/15 12:20 — **Matrix: Water**
Date Received: 11/05/15 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			221012	11/09/15 15:01	MMS	TAL SL
Total/NA	Analysis	903.0		1	224986	12/01/15 17:03	RTM	TAL SL
Total/NA	Prep	PrecSep_0			221016	11/09/15 15:41	MMS	TAL SL
Total/NA	Analysis	904.0		1	222255	11/16/15 11:51	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	225215	12/02/15 20:01	RTM	TAL SL

Client Sample ID: FC-CCR-MW63-110415 — Lab Sample ID: 240-57527-3

Date Collected: 11/04/15 14:15 — **Matrix: Water**
Date Received: 11/05/15 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			221012	11/09/15 15:01	MMS	TAL SL
Total/NA	Analysis	903.0		1	224986	12/01/15 17:03	RTM	TAL SL
Total/NA	Prep	PrecSep_0			221016	11/09/15 15:41	MMS	TAL SL
Total/NA	Analysis	904.0		1	222255	11/16/15 11:51	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	225215	12/02/15 20:01	RTM	TAL SL

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: FCCP APS Four Corners

TestAmerica Job ID: 240-57527-2

Laboratory: TestAmerica Canton

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

Authority	Program	EPA Region	Certification ID	Expiration Date
California	NELAP	9	01144CA	06-30-14 *
California	State Program	9	2927	04-30-17
Connecticut	State Program	1	PH-0590	12-31-15
Illinois	NELAP	5	200004	07-31-16
Kansas	NELAP	7	E-10336	01-31-16 *
Kentucky (UST)	State Program	4	58	02-26-16
Kentucky (WW)	State Program	4	98016	12-31-15
L-A-B	DoD ELAP		L2315	07-18-16
Minnesota	NELAP	5	039-999-348	12-31-15
Nevada	State Program	9	OH-000482008A	07-31-16
New Jersey	NELAP	2	OH001	11-30-15 *
New York	NELAP	2	10975	03-31-16
Ohio VAP	State Program	5	CL0024	09-14-17
Oregon	NELAP	10	4062	02-23-16
Pennsylvania	NELAP	3	68-00340	08-31-16
Texas	NELAP	6	T104704517-15-5	08-31-16
USDA	Federal		P330-13-00319	11-26-16
Virginia	NELAP	3	460175	09-14-16
Washington	State Program	10	C971	01-12-16
West Virginia DEP	State Program	3	210	12-31-15
Wisconsin	State Program	5	999518190	08-31-16

Laboratory: TestAmerica St. Louis

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	MO00054	06-30-16
California	ELAP	9	2886	03-31-16
Connecticut	State Program	1	PH-0241	03-31-17
Florida	NELAP	4	E87689	06-30-16
Illinois	NELAP	5	003757	11-30-16
Iowa	State Program	7	373	12-01-16
Kansas	NELAP	7	E-10236	01-31-16 *
Kentucky (DW)	State Program	4	90125	12-31-15 *
L-A-B	DoD ELAP		L2305	01-10-16 *
Louisiana	NELAP	6	04080	06-30-16
Louisiana (DW)	NELAP	6	LA160008	12-31-16
Maryland	State Program	3	310	09-30-16
Missouri	State Program	7	780	06-30-16
Nevada	State Program	9	MO000542016-1	07-31-16
New Jersey	NELAP	2	MO002	06-30-16
New York	NELAP	2	11616	03-31-16
North Dakota	State Program	8	R207	06-30-16
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-16
Pennsylvania	NELAP	3	68-00540	02-28-16
South Carolina	State Program	4	85002001	06-30-16
Texas	NELAP	6	T104704193-15-9	07-31-16
USDA	Federal		P330-07-00122	01-09-17
Utah	NELAP	8	MO000542015-7	07-31-16

* Certification renewal pending - certification considered valid.

Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: FCCP APS Four Corners

TestAmerica Job ID: 240-57527-2

Laboratory: TestAmerica St. Louis (Continued)

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Virginia	NELAP	3	460230	06-14-16
Washington	State Program	10	C592	08-30-16
West Virginia DEP	State Program	3	381	08-31-16

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

CHAIN OF CUSTODY
AND
RECEIVING DOCUMENTS

240-57527 Chain of Custody

4101 Shuffel Street, N.W. North Canton, OH 44720 tel 330.497.9396 fax 330.497.0772 www.testamericainc.com

Test America Phoenix 2.6/C2.7

4625 E. Cotton Center Blvd.
Suite 189
Phoenix, AZ 85040
Phone: 602.437.3340 Fax:

Chain of Custody Record

097568

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☒ Other:

Client Contact			
Company Name: AECOM	Project Manager: Don Sola	Site Contact: Becki Strait	Date: 11-4-15
Address: 7720 N. 16th St #100	Tel/Fax:	Lab Contact: ↓	Carrier: FEDEX
City/State/Zip: Phoenix AZ 85020			COC No: 097568
Phone: 602-648-2530			1 of 1 COCs
Fax:			Sampler: Rick Smith
Project Name: CCR			For Lab Use Only:
Site: FCCP APS Four Corners			Walk-in Client:
P O #			Lab Sampling:
			Job / SDG No.:

Analysis Turnaround Time
☐ CALENDAR DAYS ☐ WORKING DAYS
TAT if different from Below _____
☒ 2 weeks
☐ 1 week
☐ 2 days
☐ 1 day

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	200.8 mod Cadmium list	Nitrate/Nitrite as N	Cond = TDS Cations	903.0 Std Radiolist	904.0 Std Radiolist	Sample Specific Notes:
FC-CCR-MW69-110415	11-4-15	1015	G	GW	5	N	N	X	X	X	X	X	
FC-CCR-MW67-110415	11-4-15	1220	G	GW	5	N	N	X	X	X	X	X	
FC-CCR-MW63-110415	11-4-15	1415	G	GW	5	N	N	X	X	X	X	X	

Preservation Used: 1=Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☒ Disposal by Lab ☐ Archive for_____ Months

Special Instructions/QC Requirements & Comments: Shipping order 31132 Quote# 24015200

Custody Seals Intact: ☒ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ Therm ID No.:_____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	AECOM	11-4-15 1600	TO FedEx		
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
			[signature]	TA-Canton	11/5/15 930
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
			[signature]		

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 57577
Canton Facility

Client AECOM Site Name _____ Cooler unpacked by:
Cooler Received on 11/5/15 Opened on 11/5/15
FedEx: 1st Grd Exp UPS FAS Stetson Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # _____ Foam Box Client Cooler Box Other _____
Packing material used: Bubble Wrap Foam Plastic Bag None Other _____
COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt
   IR GUN# 53 (CF +0.1 °C) Observed Cooler Temp. 2.6 °C Corrected Cooler Temp. 2.7 °C
   IR GUN# 48 (CF -0.3 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C ☐ See Multiple Cooler Form
   ~~IR GUN# 5 (CF +0.4 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C~~
   IR GUN# 8 (CF -0.5 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Were sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC554612
12. Were VOAs on the COC? Yes No
13. Were air bubbles >6 mm in any VOA vials? Yes No NA
14. Was a trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other
Concerning _____

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by:

15. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

16. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____.

Login Container Summary Report

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Preservative Added (mls)	Lot #
FC-CCR-MW69-110415	240-57527-A-1	Plastic 250ml - with Sulfuric Acid	<2	_____	_____
FC-CCR-MW69-110415	240-57527-C-1	Plastic 500ml - with Nitric Acid	<2	_____	_____
FC-CCR-MW69-110415	240-57527-D-1	Plastic 1 liter - Nitric Acid	<2	_____	_____
FC-CCR-MW69-110415	240-57527-E-1	Plastic 1 liter - Nitric Acid	<2	_____	_____
FC-CCR-MW67-110415	240-57527-A-2	Plastic 250ml - with Sulfuric Acid	<2	_____	_____
FC-CCR-MW67-110415	240-57527-C-2	Plastic 500ml - with Nitric Acid	<2	_____	_____
FC-CCR-MW67-110415	240-57527-D-2	Plastic 1 liter - Nitric Acid	<2	_____	_____
FC-CCR-MW67-110415	240-57527-E-2	Plastic 1 liter - Nitric Acid	<2	_____	_____
FC-CCR-MW63-110415	240-57527-A-3	Plastic 250ml - with Sulfuric Acid	<2	_____	_____
FC-CCR-MW63-110415	240-57527-C-3	Plastic 500ml - with Nitric Acid	<2	_____	_____
FC-CCR-MW63-110415	240-57527-D-3	Plastic 1 liter - Nitric Acid	<2	_____	_____
FC-CCR-MW63-110415	240-57527-E-3	Plastic 1 liter - Nitric Acid	<2	_____	_____