

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

TestAmerica Job ID: 160-16598-2

Client Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

For:

Westinghouse Electric Company LLC
3300 State Road P
Festus, Missouri 63028

Attn: Mr. Martin Swanson



Authorized for release by:
4/13/2016 3:42:39 PM

Ivan Vania, Project Manager II
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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.

1

2

3

4

5

6

7

8

9

10

11



Table of Contents

Cover Page	1
Table of Contents	2
Case Narrative	3
Chain of Custody	5
Receipt Checklists	7
Definitions/Glossary	8
Method Summary	9
Sample Summary	10
Client Sample Results	11
QC Sample Results	20
QC Association Summary	23

Case Narrative

Client: Westinghouse Electric Company LLC
Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Job ID: 160-16598-2

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Westinghouse Electric Company LLC

Project: HDP RFP-CBA-022 (7 DAY TAT)

Report Number: 160-16598-2

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.

TestAmerica St. Louis 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.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

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

RECEIPT

The samples were received on 3/18/2016 11:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 20.0° C and 20.0° C.

RADIUM-226 BY GAMMA SPEC (21 DAY INGROWTH)

Samples L04-03-01-P-S-S-00 (160-16598-1), L04-03-02-P-R-S-00 (160-16598-2), L04-03-04-P-S-S-00 (160-16598-3), L04-03-05-P-R-S-00 (160-16598-4), L04-03-07-P-S-S-00 (160-16598-5), L04-03-08-P-R-S-00 (160-16598-6), L04-03-10-P-S-S-00 (160-16598-7), L04-03-11-P-R-S-00 (160-16598-8), L04-03-13-P-S-S-00 (160-16598-9), L04-03-14-P-R-S-00 (160-16598-10), L04-03-14-P-R-Q-00 (160-16598-11), L04-03-16-P-S-S-00 (160-16598-12), L04-03-17-P-R-S-00 (160-16598-13), L04-03-19-P-S-S-00 (160-16598-14), L04-03-20-P-R-S-00 (160-16598-15), L04-03-22-P-S-S-00 (160-16598-16), L04-03-23-P-R-S-00 (160-16598-17) and L04-03-23-P-R-Q-00 (160-16598-18) were analyzed for Radium-226 by gamma spec (21 day ingrowth) in accordance with EPA GA_01_R. The samples were leached on 03/18/2016, prepared on 03/22/2016 and analyzed on 04/12/2016.

Preparation Batch 160-241600:

The replicate error ratio was outside of the acceptance limits of 1 for protactinium-231 (1.22). Both the sample and duplicate activity were

Case Narrative

Client: Westinghouse Electric Company LLC
Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Job ID: 160-16598-2 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

less than the MDC. L04-03-20-P-R-S-00 (160-16598-15), L04-03-22-P-S-S-00 (160-16598-16), L04-03-23-P-R-S-00 (160-16598-17), L04-03-23-P-R-Q-00 (160-16598-18), (LCS 160-241600/2-A), (MB 160-241600/1-A) and (160-16598-A-15-F DU)

Preparation Batch 160-241603:

The replicate error ratio was outside of the acceptance limits of 1 for protactinium-231 (1.29). Both the sample and duplicate activity were less than the MDC. L04-03-01-P-S-S-00 (160-16598-1), L04-03-02-P-R-S-00 (160-16598-2), L04-03-04-P-S-S-00 (160-16598-3), L04-03-05-P-R-S-00 (160-16598-4), L04-03-07-P-S-S-00 (160-16598-5), L04-03-08-P-R-S-00 (160-16598-6), L04-03-10-P-S-S-00 (160-16598-7), L04-03-11-P-R-S-00 (160-16598-8), L04-03-13-P-S-S-00 (160-16598-9), L04-03-14-P-R-S-00 (160-16598-10), L04-03-14-P-R-Q-00 (160-16598-11), L04-03-16-P-S-S-00 (160-16598-12), L04-03-17-P-R-S-00 (160-16598-13), L04-03-19-P-S-S-00 (160-16598-14), (LCS 160-241603/2-A), (MB 160-241603/1-A), (160-16595-A-1-H) and (160-16595-A-1-I DU)

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

Hematite Decommissioning Project

Procedure HDP-PR-QA-006, Chain of Custody

Revision: 4

Page 1 of 1

Westinghouse Non-Proprietary Class 3

FORM HDP-PR-QA-006-1
CHAIN OF CUSTODY

Instructions: Each time the container is transferred to another organization, a person from each organization should sign the CoC. The Laboratory/End User must verify that the sample is correctly identified before the sample is released for use or analysis and send the completed CoC to HDP.

Chain of Custody ID No.	F-031716-04	Page	1/2
Project Name: Westinghouse Electric Company			
Contact Person: Clark Evers			
Phone Number: 314-810-3336			
Sampler Name: John Michel			
Requested Analysis			
Total Containers			
Laboratory Name: TA-MO			
Laboratory Address: 13715 Rider Trail North			
Phone No.: 314-298-8566			
Laboratory Contact Person: Ivan Vania			
Phone No.: 708-870-8453			
Turn Around Time			
Rush (7 days)			
Remarks			

Sample ID	Date	Time	Matrix	Comp (C) or Grab (G)	Gamma Spec	Isotopic Uranium	Tc-99	Gamma Spec (21 day ingrow for Ra-226)					Total Containers	Remarks
L04-03-01-P-S-S-00	3/17/2016	9:00	S	G	X		X	X					1	LSA 04-03
L04-03-02-P-R-S-00	3/17/2016	9:20	S	C	X		X	X					1	LSA 04-03
L04-03-04-P-S-S-00	3/17/2016	9:28	S	G	X		X	X					1	LSA 04-03
L04-03-05-P-R-S-00	3/17/2016	14:50	S	C	X		X	X					1	LSA 04-03
L04-03-07-P-S-S-00	3/17/2016	9:35	S	G	X		X	X					1	LSA 04-03
L04-03-08-P-R-S-00	3/17/2016	9:50	S	C	X		X	X					1	LSA 04-03
L04-03-10-P-S-S-00	3/17/2016	10:20	S	G	X		X	X					1	LSA 04-03
L04-03-11-P-R-S-00	3/17/2016	10:45	S	C	X		X	X					1	LSA 04-03
L04-03-13-P-S-S-00	3/17/2016	13:30	S	G	X		X	X					1	LSA 04-03
L04-03-14-P-R-S-00	3/17/2016	13:45	S	C	X		X	X					1	LSA 04-03
L04-03-14-P-R-Q-00	3/17/2016	13:45	S	C	X		X	X					1	LSA 04-03
L04-03-16-P-S-S-00	3/17/2016	13:05	S	G	X		X	X					1	LSA 04-03



Relinquished by: <i>Thomas Yarb</i>	Date/Time: 3-18-16	Received by: <i>R. B. 3815</i>	Date/Time: 3-18-16	Total: 18	Cooler Temperature: Ambient
Company Name: <i>WEC</i>	09:25	Company Name: <i>CROSS ROAD</i>	09:25	Cooler ID: <i>031702103</i>	Shipper and Number:
Received by:	Date/Time:	Relinquished by:	Date/Time:	Comments: N/A	
Company Name:		Company Name:			
Relinquished by: <i>R. B. 3815</i>	Date/Time: 3-18-16	Received by: <i>Thomas Yarb</i>	Date/Time: 3-18-16	Verified By: <i>Thomas Yarb</i>	
Company Name: <i>CROSS ROAD</i>	11:10	Company Name: <i>THAS</i>	11:10	3-18-16	

Page 5 of 23



Hematite Decommissioning Project

Procedure HDP-PR-QA-006, Chain of Custody

Revision: 4

Page 1 of 1

Westinghouse Non-Proprietary Class 3

FORM HDP-PR-QA-006-1
CHAIN OF CUSTODY

Instructions: Each time the container is transferred to another organization, a person from each organization should sign the CoC. The Laboratory/End User must verify that the sample is correctly identified before the sample is released for use or analysis and send the completed CoC to HDP.

Chain of Custody ID No. F-031716-04 Page 2/2				Requested Analysis								Laboratory Name: TA-MO			
Project Name: Westinghouse Electric Company				Comp (C) or Grab (G)	Gamma Spec	Isotopic Uranium	Tc-99	Gamma Spec (21 day ingrow for Ra-226)					Total Containers	Laboratory Address: 13715 Rider Trail North	
Contact Person: Clark Evers														Phone No. 314-298-8566	
Phone Number: 314-810-3336														Laboratory Contact Person: Ivan Vania	
Sampler Name:														Phone No. 708-870-8453	
				Turn Around Time											
				Rush		(7 days)									
				Remarks											
Sample ID	Date	Time	Matrix	Comp (C) or Grab (G)	Gamma Spec	Isotopic Uranium	Tc-99	Gamma Spec (21 day ingrow for Ra-226)							
L04-03-17-P-R-S-00	3/17/2016	13:25	S	C	X	X	X	X					1	LSA 04-03	
L04-03-19-P-S-S-00	3/17/2016	13:52	S	G	X	X	X	X					1	LSA 04-03	
L04-03-20-P-R-S-00	3/17/2016	14:05	S	C	X	X	X	X					1	LSA 04-03	
L04-03-22-P-S-S-00	3/17/2016	14:12	S	G	X	X	X	X					1	LSA 04-03	
L04-03-23-P-R-S-00	3/17/2016	14:23	S	C	X	X	X	X					1	LSA 04-03	
L04-03-23-P-R-Q-00	3/17/2016	14:23	S	C	X	X	X	X					1	LSA 04-03	
 															
Relinquished by: <i>Thomas Yard</i>				Date/Time: 3-18-16				Received by: <i>3815</i>				Total: 18		Cooler Temperature: Ambient	
Company Name: <i>WEC</i>				Date/Time: 09:25				Company Name: <i>CROSS ROADS</i>				Cooler ID: 0317-02/03		Shipper and Number:	
Received by:				Date/Time:				Relinquished by:				Comments: N/A			
Company Name:				Date/Time:				Company Name:							
Relinquished by: <i>3815</i>				Date/Time: 3-18-16				Received by: <i>1110</i>				Verified By: <i>Thomas Yard / [Signature]</i>			
Company Name: <i>CROSS ROADS</i>				Date/Time: 11:10				Company Name: <i>THORNTON</i>				Verified By: <i>3-18-16</i>			



Login Sample Receipt Checklist

Client: Westinghouse Electric Company LLC

Job Number: 160-16598-2

Login Number: 16598

List Source: TestAmerica St. Louis

List Number: 1

Creator: Dedner, Connie L

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

Definitions/Glossary

Client: Westinghouse Electric Company LLC
Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.
F	Duplicate RPD exceeds the control limit

Glossary

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

Method Summary

Client: Westinghouse Electric Company LLC
Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Method	Method Description	Protocol	Laboratory
GA-01-R	Radium-226 & Other Gamma Emitters (GS)	DOE	TAL SL

Protocol References:

DOE = U.S. Department of Energy

Laboratory References:

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



Sample Summary

Client: Westinghouse Electric Company LLC
Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-16598-1	L04-03-01-P-S-S-00	Solid	03/17/16 09:00	03/18/16 11:10
160-16598-2	L04-03-02-P-R-S-00	Solid	03/17/16 09:20	03/18/16 11:10
160-16598-3	L04-03-04-P-S-S-00	Solid	03/17/16 09:28	03/18/16 11:10
160-16598-4	L04-03-05-P-R-S-00	Solid	03/17/16 14:50	03/18/16 11:10
160-16598-5	L04-03-07-P-S-S-00	Solid	03/17/16 09:35	03/18/16 11:10
160-16598-6	L04-03-08-P-R-S-00	Solid	03/17/16 09:50	03/18/16 11:10
160-16598-7	L04-03-10-P-S-S-00	Solid	03/17/16 10:20	03/18/16 11:10
160-16598-8	L04-03-11-P-R-S-00	Solid	03/17/16 10:45	03/18/16 11:10
160-16598-9	L04-03-13-P-S-S-00	Solid	03/17/16 13:30	03/18/16 11:10
160-16598-10	L04-03-14-P-R-S-00	Solid	03/17/16 13:45	03/18/16 11:10
160-16598-11	L04-03-14-P-R-Q-00	Solid	03/17/16 13:45	03/18/16 11:10
160-16598-12	L04-03-16-P-S-S-00	Solid	03/17/16 13:05	03/18/16 11:10
160-16598-13	L04-03-17-P-R-S-00	Solid	03/17/16 13:25	03/18/16 11:10
160-16598-14	L04-03-19-P-S-S-00	Solid	03/17/16 13:52	03/18/16 11:10
160-16598-15	L04-03-20-P-R-S-00	Solid	03/17/16 14:05	03/18/16 11:10
160-16598-16	L04-03-22-P-S-S-00	Solid	03/17/16 14:12	03/18/16 11:10
160-16598-17	L04-03-23-P-R-S-00	Solid	03/17/16 14:23	03/18/16 11:10
160-16598-18	L04-03-23-P-R-Q-00	Solid	03/17/16 14:23	03/18/16 11:10

Client Sample Results

Client: Westinghouse Electric Company LLC
 Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Client Sample ID: L04-03-01-P-S-S-00

Lab Sample ID: 160-16598-1

Date Collected: 03/17/16 09:00

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.936		0.104	0.141		0.0927	pCi/g	03/22/16 09:58	04/12/16 11:19	1
Bismuth 212	0.905		0.298	0.313		0.313	pCi/g	03/22/16 09:58	04/12/16 11:19	1
Bismuth 214	0.969		0.0893	0.135		0.0579	pCi/g	03/22/16 09:58	04/12/16 11:19	1
Lead 212	0.869		0.0656	0.130		0.0567	pCi/g	03/22/16 09:58	04/12/16 11:19	1
Lead 214	1.02		0.0787	0.132		0.0561	pCi/g	03/22/16 09:58	04/12/16 11:19	1
Potassium 40	15.6		0.929	1.84		0.344	pCi/g	03/22/16 09:58	04/12/16 11:19	1
Protactinium 231	0.258	U	0.400	0.401		0.665	pCi/g	03/22/16 09:58	04/12/16 11:19	1
Radium 226	0.969		0.0893	0.135	1.00	0.0579	pCi/g	03/22/16 09:58	04/12/16 11:19	1
Thorium 232	0.936		0.104	0.141		0.0927	pCi/g	03/22/16 09:58	04/12/16 11:19	1
Thorium 234	0.904		0.274	0.289		0.707	pCi/g	03/22/16 09:58	04/12/16 11:19	1
Uranium 235	0.225		0.110	0.113		0.173	pCi/g	03/22/16 09:58	04/12/16 11:19	1
Americium 241	0.0107	U	0.0460	0.0460		0.0771	pCi/g	03/22/16 09:58	04/12/16 11:19	1
Protactinium 234m	0.630	U	2.37	2.37		3.97	pCi/g	03/22/16 09:58	04/12/16 11:19	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.						
<i>Tl-208</i>	0.293		0.0393	0.0497		0.0306	pCi/g	03/22/16 09:58	04/12/16 11:19	1

Client Sample ID: L04-03-02-P-R-S-00

Lab Sample ID: 160-16598-2

Date Collected: 03/17/16 09:20

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.12		0.127	0.170		0.115	pCi/g	03/22/16 09:58	04/12/16 11:21	1
Bismuth 212	1.14		0.409	0.425		0.396	pCi/g	03/22/16 09:58	04/12/16 11:21	1
Bismuth 214	0.924		0.0992	0.138		0.0648	pCi/g	03/22/16 09:58	04/12/16 11:21	1
Lead 212	0.948		0.0796	0.146		0.0685	pCi/g	03/22/16 09:58	04/12/16 11:21	1
Lead 214	1.13		0.0821	0.143		0.0661	pCi/g	03/22/16 09:58	04/12/16 11:21	1
Potassium 40	17.9		1.12	2.14		0.202	pCi/g	03/22/16 09:58	04/12/16 11:21	1
Protactinium 231	0.520	U	0.242	0.249		1.04	pCi/g	03/22/16 09:58	04/12/16 11:21	1
Radium 226	0.924		0.0992	0.138	1.00	0.0648	pCi/g	03/22/16 09:58	04/12/16 11:21	1
Thorium 232	1.12		0.127	0.170		0.115	pCi/g	03/22/16 09:58	04/12/16 11:21	1
Thorium 234	1.40		0.520	0.540		0.812	pCi/g	03/22/16 09:58	04/12/16 11:21	1
Uranium 235	0.131	U	0.141	0.142		0.232	pCi/g	03/22/16 09:58	04/12/16 11:21	1
Americium 241	-0.0143	U	0.0446	0.0446		0.0749	pCi/g	03/22/16 09:58	04/12/16 11:21	1
Protactinium 234m	6.95		3.24	3.31		5.43	pCi/g	03/22/16 09:58	04/12/16 11:21	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.						
<i>Tl-208</i>	0.321		0.0442	0.0553		0.0344	pCi/g	03/22/16 09:58	04/12/16 11:21	1

Client Sample Results

Client: Westinghouse Electric Company LLC
 Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Client Sample ID: L04-03-04-P-S-S-00

Lab Sample ID: 160-16598-3

Date Collected: 03/17/16 09:28

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.972		0.113	0.150		0.0954	pCi/g	03/22/16 09:58	04/12/16 11:22	1
Bismuth 212	1.24		0.352	0.374		0.315	pCi/g	03/22/16 09:58	04/12/16 11:22	1
Bismuth 214	1.09		0.0836	0.140		0.0607	pCi/g	03/22/16 09:58	04/12/16 11:22	1
Lead 212	1.01		0.0676	0.148		0.0555	pCi/g	03/22/16 09:58	04/12/16 11:22	1
Lead 214	1.08		0.0838	0.140		0.0598	pCi/g	03/22/16 09:58	04/12/16 11:22	1
Potassium 40	16.7		0.939	1.93		0.312	pCi/g	03/22/16 09:58	04/12/16 11:22	1
Protactinium 231	0.235	U	0.150	0.152		1.02	pCi/g	03/22/16 09:58	04/12/16 11:22	1
Radium 226	1.09		0.0836	0.140	1.00	0.0607	pCi/g	03/22/16 09:58	04/12/16 11:22	1
Thorium 232	0.972		0.113	0.150		0.0954	pCi/g	03/22/16 09:58	04/12/16 11:22	1
Thorium 234	0.984		0.252	0.273		0.718	pCi/g	03/22/16 09:58	04/12/16 11:22	1
Uranium 235	0.398		0.146	0.152		0.178	pCi/g	03/22/16 09:58	04/12/16 11:22	1
Americium 241	-0.00443	U	0.191	0.191		0.0894	pCi/g	03/22/16 09:58	04/12/16 11:22	1
Protactinium 234m	6.45		2.13	2.23		4.43	pCi/g	03/22/16 09:58	04/12/16 11:22	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Pb-210	1.36		0.527	0.550		0.652	pCi/g	03/22/16 09:58	04/12/16 11:22	1
Tl-208	0.328		0.0382	0.0509		0.0268	pCi/g	03/22/16 09:58	04/12/16 11:22	1

Client Sample ID: L04-03-05-P-R-S-00

Lab Sample ID: 160-16598-4

Date Collected: 03/17/16 14:50

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.886		0.105	0.139		0.0751	pCi/g	03/22/16 09:58	04/12/16 12:02	1
Bismuth 212	0.826		0.289	0.301		0.381	pCi/g	03/22/16 09:58	04/12/16 12:02	1
Bismuth 214	0.898		0.0986	0.136		0.0688	pCi/g	03/22/16 09:58	04/12/16 12:02	1
Lead 212	0.917		0.0673	0.136		0.0502	pCi/g	03/22/16 09:58	04/12/16 12:02	1
Lead 214	1.06		0.0992	0.149		0.0716	pCi/g	03/22/16 09:58	04/12/16 12:02	1
Potassium 40	15.8		1.00	1.90		0.315	pCi/g	03/22/16 09:58	04/12/16 12:02	1
Protactinium 231	0.280	U	0.210	0.212		0.978	pCi/g	03/22/16 09:58	04/12/16 12:02	1
Radium 226	0.898		0.0986	0.136	1.00	0.0688	pCi/g	03/22/16 09:58	04/12/16 12:02	1
Thorium 232	0.886		0.105	0.139		0.0751	pCi/g	03/22/16 09:58	04/12/16 12:02	1
Thorium 234	1.34		0.481	0.501		0.752	pCi/g	03/22/16 09:58	04/12/16 12:02	1
Uranium 235	0.267		0.121	0.124		0.144	pCi/g	03/22/16 09:58	04/12/16 12:02	1
Americium 241	-0.0151	U	0.0497	0.0497		0.0834	pCi/g	03/22/16 09:58	04/12/16 12:02	1
Protactinium 234m	3.71	U	2.23	2.26		5.07	pCi/g	03/22/16 09:58	04/12/16 12:02	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Pb-210	1.39		0.525	0.549		0.662	pCi/g	03/22/16 09:58	04/12/16 12:02	1
Tl-208	0.284		0.0390	0.0489		0.0288	pCi/g	03/22/16 09:58	04/12/16 12:02	1

Client Sample Results

Client: Westinghouse Electric Company LLC
 Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Client Sample ID: L04-03-07-P-S-S-00

Lab Sample ID: 160-16598-5

Date Collected: 03/17/16 09:35

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.865		0.105	0.137		0.0863	pCi/g	03/22/16 09:58	04/12/16 11:59	1
Bismuth 212	1.11		0.379	0.397		0.342	pCi/g	03/22/16 09:58	04/12/16 11:59	1
Bismuth 214	0.862		0.0869	0.125		0.0597	pCi/g	03/22/16 09:58	04/12/16 11:59	1
Lead 212	0.985		0.0732	0.147		0.0595	pCi/g	03/22/16 09:58	04/12/16 11:59	1
Lead 214	1.06		0.0840	0.138		0.0603	pCi/g	03/22/16 09:58	04/12/16 11:59	1
Potassium 40	16.8		0.936	1.96		0.229	pCi/g	03/22/16 09:58	04/12/16 11:59	1
Protactinium 231	-0.546	U	0.610	0.613		1.00	pCi/g	03/22/16 09:58	04/12/16 11:59	1
Radium 226	0.862		0.0869	0.125	1.00	0.0597	pCi/g	03/22/16 09:58	04/12/16 11:59	1
Thorium 232	0.865		0.105	0.137		0.0863	pCi/g	03/22/16 09:58	04/12/16 11:59	1
Thorium 234	1.23		0.605	0.618		0.765	pCi/g	03/22/16 09:58	04/12/16 11:59	1
Uranium 235	0.202		0.125	0.127		0.181	pCi/g	03/22/16 09:58	04/12/16 11:59	1
Americium 241	0.00270	U	0.0531	0.0531		0.0894	pCi/g	03/22/16 09:58	04/12/16 11:59	1
Protactinium 234m	-1.22	U	4.60	4.60		4.68	pCi/g	03/22/16 09:58	04/12/16 11:59	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<i>Tl-208</i>			<i>0.0429</i>	<i>0.0555</i>		<i>0.0329</i>	<i>pCi/g</i>	<i>03/22/16 09:58</i>	<i>04/12/16 11:59</i>	<i>1</i>

Client Sample ID: L04-03-08-P-R-S-00

Lab Sample ID: 160-16598-6

Date Collected: 03/17/16 09:50

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.960		0.116	0.152		0.0775	pCi/g	03/22/16 09:58	04/12/16 12:01	1
Bismuth 212	0.963		0.371	0.384		0.356	pCi/g	03/22/16 09:58	04/12/16 12:01	1
Bismuth 214	0.897		0.0911	0.130		0.0551	pCi/g	03/22/16 09:58	04/12/16 12:01	1
Lead 212	0.918		0.0756	0.141		0.0621	pCi/g	03/22/16 09:58	04/12/16 12:01	1
Lead 214	1.01		0.0834	0.134		0.0650	pCi/g	03/22/16 09:58	04/12/16 12:01	1
Potassium 40	16.5		1.08	2.00		0.290	pCi/g	03/22/16 09:58	04/12/16 12:01	1
Protactinium 231	0.561	U	0.301	0.307		1.01	pCi/g	03/22/16 09:58	04/12/16 12:01	1
Radium 226	0.897		0.0911	0.130	1.00	0.0551	pCi/g	03/22/16 09:58	04/12/16 12:01	1
Thorium 232	0.960		0.116	0.152		0.0775	pCi/g	03/22/16 09:58	04/12/16 12:01	1
Thorium 234	0.657	U	0.252	0.262		0.698	pCi/g	03/22/16 09:58	04/12/16 12:01	1
Uranium 235	0.210		0.136	0.137		0.157	pCi/g	03/22/16 09:58	04/12/16 12:01	1
Americium 241	-0.000286	U	0.0515	0.0515		0.0872	pCi/g	03/22/16 09:58	04/12/16 12:01	1
Protactinium 234m	1.08	U	2.87	2.87		4.95	pCi/g	03/22/16 09:58	04/12/16 12:01	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<i>Tl-208</i>			<i>0.0443</i>	<i>0.0523</i>		<i>0.0352</i>	<i>pCi/g</i>	<i>03/22/16 09:58</i>	<i>04/12/16 12:01</i>	<i>1</i>

Client Sample Results

Client: Westinghouse Electric Company LLC
 Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Client Sample ID: L04-03-10-P-S-S-00

Lab Sample ID: 160-16598-7

Date Collected: 03/17/16 10:20

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.11		0.135	0.175		0.0764	pCi/g	03/22/16 09:58	04/12/16 12:00	1
Bismuth 212	0.997		0.338	0.353		0.474	pCi/g	03/22/16 09:58	04/12/16 12:00	1
Bismuth 214	1.02		0.0847	0.135		0.0633	pCi/g	03/22/16 09:58	04/12/16 12:00	1
Lead 212	0.959		0.0734	0.145		0.0650	pCi/g	03/22/16 09:58	04/12/16 12:00	1
Lead 214	1.17		0.0847	0.149		0.0682	pCi/g	03/22/16 09:58	04/12/16 12:00	1
Potassium 40	20.1		1.05	2.28		0.283	pCi/g	03/22/16 09:58	04/12/16 12:00	1
Protactinium 231	0.454	U	0.235	0.240		1.02	pCi/g	03/22/16 09:58	04/12/16 12:00	1
Radium 226	1.02		0.0847	0.135	1.00	0.0633	pCi/g	03/22/16 09:58	04/12/16 12:00	1
Thorium 232	1.11		0.135	0.175		0.0764	pCi/g	03/22/16 09:58	04/12/16 12:00	1
Thorium 234	0.902		0.251	0.269		0.707	pCi/g	03/22/16 09:58	04/12/16 12:00	1
Uranium 235	0.254		0.122	0.125		0.220	pCi/g	03/22/16 09:58	04/12/16 12:00	1
Americium 241	-0.0115	U	0.340	0.340		0.0837	pCi/g	03/22/16 09:58	04/12/16 12:00	1
Protactinium 234m	0.190	U	2.47	2.47		4.37	pCi/g	03/22/16 09:58	04/12/16 12:00	1
Other Detected Radionuclides			Count	Total						
	Result	Qualifier	Uncert.	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
TI-208	0.340		0.0478	0.0592		0.0370	pCi/g	03/22/16 09:58	04/12/16 12:00	1

Client Sample ID: L04-03-11-P-R-S-00

Lab Sample ID: 160-16598-8

Date Collected: 03/17/16 10:45

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.957		0.0995	0.139		0.0677	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Bismuth 212	1.20		0.380	0.400		0.347	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Bismuth 214	0.947		0.0920	0.135		0.0596	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Lead 212	0.910		0.0668	0.135		0.0578	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Lead 214	1.13		0.0884	0.147		0.0604	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Potassium 40	17.5		1.01	2.06		0.365	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Protactinium 231	0.224	U	0.146	0.148		0.991	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Radium 226	0.947		0.0920	0.135	1.00	0.0596	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Thorium 232	0.957		0.0995	0.139		0.0677	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Thorium 234	0.731		0.246	0.258		0.721	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Uranium 235	0.0425	U	0.112	0.112		0.220	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Americium 241	0.0244	U	0.0551	0.0552		0.0918	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Protactinium 234m	0.703	U	1.40	1.41		4.67	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Other Detected Radionuclides			Count	Total						
	Result	Qualifier	Uncert.	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
TI-208	0.320		0.0443	0.0553		0.0334	pCi/g	03/22/16 09:58	04/12/16 12:38	1

Client Sample Results

Client: Westinghouse Electric Company LLC
 Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Client Sample ID: L04-03-13-P-S-S-00

Lab Sample ID: 160-16598-9

Date Collected: 03/17/16 13:30

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.919		0.120	0.152		0.0929	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Bismuth 212	1.11		0.400	0.417		0.381	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Bismuth 214	0.886		0.0983	0.135		0.0664	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Lead 212	0.977		0.0757	0.147		0.0647	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Lead 214	1.01		0.0818	0.133		0.0713	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Potassium 40	17.9		1.13	2.15		0.292	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Protactinium 231	0.566	U	0.302	0.309		0.767	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Radium 226	0.886		0.0983	0.135	1.00	0.0664	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Thorium 232	0.919		0.120	0.152		0.0929	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Thorium 234	1.11		0.490	0.504		0.775	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Uranium 235	0.154	U	0.138	0.138		0.179	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Americium 241	0.0215	U	0.0539	0.0540		0.0900	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Protactinium 234m	-0.268	U	2.43	2.43		4.37	pCi/g	03/22/16 09:58	04/12/16 12:38	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<i>Tl-208</i>			<i>0.0452</i>	<i>0.0590</i>		<i>0.0314</i>	<i>pCi/g</i>	<i>03/22/16 09:58</i>	<i>04/12/16 12:38</i>	<i>1</i>

Client Sample ID: L04-03-14-P-R-S-00

Lab Sample ID: 160-16598-10

Date Collected: 03/17/16 13:45

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.25		0.144	0.191		0.102	pCi/g	03/22/16 09:58	04/12/16 12:39	1
Bismuth 212	1.44		0.523	0.544		0.469	pCi/g	03/22/16 09:58	04/12/16 12:39	1
Bismuth 214	1.06		0.118	0.160		0.0867	pCi/g	03/22/16 09:58	04/12/16 12:39	1
Lead 212	1.22		0.0915	0.183		0.0757	pCi/g	03/22/16 09:58	04/12/16 12:39	1
Lead 214	1.10		0.102	0.154		0.0760	pCi/g	03/22/16 09:58	04/12/16 12:39	1
Potassium 40	21.2		1.18	2.44		0.348	pCi/g	03/22/16 09:58	04/12/16 12:39	1
Protactinium 231	-0.539	U	0.746	0.749		1.23	pCi/g	03/22/16 09:58	04/12/16 12:39	1
Radium 226	1.06		0.118	0.160	1.00	0.0867	pCi/g	03/22/16 09:58	04/12/16 12:39	1
Thorium 232	1.25		0.144	0.191		0.102	pCi/g	03/22/16 09:58	04/12/16 12:39	1
Thorium 234	1.56		0.712	0.730		0.880	pCi/g	03/22/16 09:58	04/12/16 12:39	1
Uranium 235	0.259		0.126	0.129		0.160	pCi/g	03/22/16 09:58	04/12/16 12:39	1
Americium 241	-0.0104	U	11.7	11.7		0.103	pCi/g	03/22/16 09:58	04/12/16 12:39	1
Protactinium 234m	0.838	U	3.35	3.35		5.79	pCi/g	03/22/16 09:58	04/12/16 12:39	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<i>Tl-208</i>			<i>0.0561</i>	<i>0.0671</i>		<i>0.0451</i>	<i>pCi/g</i>	<i>03/22/16 09:58</i>	<i>04/12/16 12:39</i>	<i>1</i>

Client Sample Results

Client: Westinghouse Electric Company LLC
 Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Client Sample ID: L04-03-14-P-R-Q-00

Lab Sample ID: 160-16598-11

Date Collected: 03/17/16 13:45

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.09		0.117	0.161		0.0994	pCi/g	03/22/16 09:58	04/12/16 12:40	1
Bismuth 212	1.09		0.349	0.367		0.333	pCi/g	03/22/16 09:58	04/12/16 12:40	1
Bismuth 214	1.03		0.0956	0.144		0.0564	pCi/g	03/22/16 09:58	04/12/16 12:40	1
Lead 212	1.06		0.0766	0.157		0.0613	pCi/g	03/22/16 09:58	04/12/16 12:40	1
Lead 214	1.21		0.0812	0.150		0.0652	pCi/g	03/22/16 09:58	04/12/16 12:40	1
Potassium 40	18.6		1.12	2.21		0.343	pCi/g	03/22/16 09:58	04/12/16 12:40	1
Protactinium 231	0.517	U	0.294	0.299		1.00	pCi/g	03/22/16 09:58	04/12/16 12:40	1
Radium 226	1.03		0.0956	0.144	1.00	0.0564	pCi/g	03/22/16 09:58	04/12/16 12:40	1
Thorium 232	1.09		0.117	0.161		0.0994	pCi/g	03/22/16 09:58	04/12/16 12:40	1
Thorium 234	1.43		0.499	0.521		0.777	pCi/g	03/22/16 09:58	04/12/16 12:40	1
Uranium 235	0.112	U	0.136	0.137		0.230	pCi/g	03/22/16 09:58	04/12/16 12:40	1
Americium 241	0.00505	U	0.0597	0.0597		0.101	pCi/g	03/22/16 09:58	04/12/16 12:40	1
Protactinium 234m	1.10	U	2.73	2.73		4.74	pCi/g	03/22/16 09:58	04/12/16 12:40	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
TI-208	0.338		0.0445	0.0567		0.0343	pCi/g	03/22/16 09:58	04/12/16 12:40	1

Client Sample ID: L04-03-16-P-S-S-00

Lab Sample ID: 160-16598-12

Date Collected: 03/17/16 13:05

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.759		0.0882	0.117		0.0904	pCi/g	03/22/16 09:58	04/12/16 13:23	1
Bismuth 212	1.06		0.356	0.372		0.313	pCi/g	03/22/16 09:58	04/12/16 13:23	1
Bismuth 214	0.725		0.0709	0.103		0.0447	pCi/g	03/22/16 09:58	04/12/16 13:23	1
Lead 212	0.742		0.0575	0.112		0.0474	pCi/g	03/22/16 09:58	04/12/16 13:23	1
Lead 214	0.854		0.0642	0.110		0.0532	pCi/g	03/22/16 09:58	04/12/16 13:23	1
Potassium 40	13.5		0.844	1.62		0.258	pCi/g	03/22/16 09:58	04/12/16 13:23	1
Protactinium 231	0.287	U	0.172	0.174		0.835	pCi/g	03/22/16 09:58	04/12/16 13:23	1
Radium 226	0.725		0.0709	0.103	1.00	0.0447	pCi/g	03/22/16 09:58	04/12/16 13:23	1
Thorium 232	0.759		0.0882	0.117		0.0904	pCi/g	03/22/16 09:58	04/12/16 13:23	1
Thorium 234	0.629	U	0.215	0.224		0.635	pCi/g	03/22/16 09:58	04/12/16 13:23	1
Uranium 235	0.0789	U	0.127	0.127		0.198	pCi/g	03/22/16 09:58	04/12/16 13:23	1
Americium 241	-0.0106	U	0.0500	0.0500		0.0839	pCi/g	03/22/16 09:58	04/12/16 13:23	1
Protactinium 234m	2.93		1.97	1.99		2.32	pCi/g	03/22/16 09:58	04/12/16 13:23	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Pb-210	1.15		0.484	0.502		0.605	pCi/g	03/22/16 09:58	04/12/16 13:23	1
TI-208	0.271		0.0370	0.0465		0.0269	pCi/g	03/22/16 09:58	04/12/16 13:23	1

TestAmerica St. Louis

Client Sample Results

Client: Westinghouse Electric Company LLC
 Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Client Sample ID: L04-03-17-P-R-S-00

Lab Sample ID: 160-16598-13

Date Collected: 03/17/16 13:25

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.11		0.120	0.165		0.120	pCi/g	03/22/16 09:58	04/12/16 13:25	1
Bismuth 212	1.08		0.437	0.451		0.428	pCi/g	03/22/16 09:58	04/12/16 13:25	1
Bismuth 214	0.959		0.104	0.144		0.0662	pCi/g	03/22/16 09:58	04/12/16 13:25	1
Lead 212	1.03		0.0802	0.155		0.0683	pCi/g	03/22/16 09:58	04/12/16 13:25	1
Lead 214	1.01		0.0888	0.137		0.0849	pCi/g	03/22/16 09:58	04/12/16 13:25	1
Potassium 40	18.6		1.21	2.25		0.404	pCi/g	03/22/16 09:58	04/12/16 13:25	1
Protactinium 231	-0.573	U	0.726	0.729		1.20	pCi/g	03/22/16 09:58	04/12/16 13:25	1
Radium 226	0.959		0.104	0.144	1.00	0.0662	pCi/g	03/22/16 09:58	04/12/16 13:25	1
Thorium 232	1.11		0.120	0.165		0.120	pCi/g	03/22/16 09:58	04/12/16 13:25	1
Thorium 234	1.74		0.525	0.555		0.799	pCi/g	03/22/16 09:58	04/12/16 13:25	1
Uranium 235	0.471		0.140	0.148		0.184	pCi/g	03/22/16 09:58	04/12/16 13:25	1
Americium 241	-0.0379	U	0.0600	0.0601		0.0993	pCi/g	03/22/16 09:58	04/12/16 13:25	1
Protactinium 234m	5.81		2.82	2.88		5.18	pCi/g	03/22/16 09:58	04/12/16 13:25	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Pb-210	1.59		0.504	0.538		0.673	pCi/g	03/22/16 09:58	04/12/16 13:25	1
Tl-208	0.392		0.0516	0.0657		0.0366	pCi/g	03/22/16 09:58	04/12/16 13:25	1

Client Sample ID: L04-03-19-P-S-S-00

Lab Sample ID: 160-16598-14

Date Collected: 03/17/16 13:52

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.23		0.147	0.193		0.0634	pCi/g	03/22/16 09:58	04/12/16 13:26	1
Bismuth 212	1.47		0.502	0.524		0.431	pCi/g	03/22/16 09:58	04/12/16 13:26	1
Bismuth 214	1.04		0.115	0.157		0.0782	pCi/g	03/22/16 09:58	04/12/16 13:26	1
Lead 212	1.08		0.0873	0.166		0.0761	pCi/g	03/22/16 09:58	04/12/16 13:26	1
Lead 214	1.14		0.0957	0.153		0.0830	pCi/g	03/22/16 09:58	04/12/16 13:26	1
Potassium 40	21.4		1.22	2.47		0.312	pCi/g	03/22/16 09:58	04/12/16 13:26	1
Protactinium 231	0.499	U	0.257	0.262		1.28	pCi/g	03/22/16 09:58	04/12/16 13:26	1
Radium 226	1.04		0.115	0.157	1.00	0.0782	pCi/g	03/22/16 09:58	04/12/16 13:26	1
Thorium 232	1.23		0.147	0.193		0.0634	pCi/g	03/22/16 09:58	04/12/16 13:26	1
Thorium 234	3.26		0.867	0.932		0.973	pCi/g	03/22/16 09:58	04/12/16 13:26	1
Uranium 235	0.250		0.135	0.138		0.185	pCi/g	03/22/16 09:58	04/12/16 13:26	1
Americium 241	0.000657	U	0.0645	0.0645		0.109	pCi/g	03/22/16 09:58	04/12/16 13:26	1
Protactinium 234m	3.48	U	3.55	3.57		5.75	pCi/g	03/22/16 09:58	04/12/16 13:26	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Pb-210	1.78		0.693	0.724		0.861	pCi/g	03/22/16 09:58	04/12/16 13:26	1
Tl-208	0.381		0.0467	0.0610		0.0331	pCi/g	03/22/16 09:58	04/12/16 13:26	1

TestAmerica St. Louis

Client Sample Results

Client: Westinghouse Electric Company LLC
 Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Client Sample ID: L04-03-20-P-R-S-00

Lab Sample ID: 160-16598-15

Date Collected: 03/17/16 14:05

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.10		0.121	0.164		0.107	pCi/g	03/22/16 10:28	04/12/16 07:02	1
Bismuth 212	1.44		0.447	0.471		0.386	pCi/g	03/22/16 10:28	04/12/16 07:02	1
Bismuth 214	0.978		0.0901	0.135		0.0595	pCi/g	03/22/16 10:28	04/12/16 07:02	1
Lead 212	1.05		0.0792	0.158		0.0673	pCi/g	03/22/16 10:28	04/12/16 07:02	1
Lead 214	1.15		0.0826	0.146		0.0693	pCi/g	03/22/16 10:28	04/12/16 07:02	1
Potassium 40	19.9		1.05	2.26		0.333	pCi/g	03/22/16 10:28	04/12/16 07:02	1
Protactinium 231	0.472	U	0.226	0.232		1.07	pCi/g	03/22/16 10:28	04/12/16 07:02	1
Radium 226	0.978		0.0901	0.135	1.00	0.0595	pCi/g	03/22/16 10:28	04/12/16 07:02	1
Thorium 232	1.10		0.121	0.164		0.107	pCi/g	03/22/16 10:28	04/12/16 07:02	1
Thorium 234	1.19		0.504	0.520		0.667	pCi/g	03/22/16 10:28	04/12/16 07:02	1
Uranium 235	0.0785	U	0.114	0.114		0.220	pCi/g	03/22/16 10:28	04/12/16 07:02	1
Americium 241	-0.000109	U	0.0536	0.0536		0.0883	pCi/g	03/22/16 10:28	04/12/16 07:02	1
Protactinium 234m	4.37		2.73	2.76		4.00	pCi/g	03/22/16 10:28	04/12/16 07:02	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Pb-210	1.18		0.573	0.590		0.705	pCi/g	03/22/16 10:28	04/12/16 07:02	1
Tl-208	0.337		0.0424	0.0547		0.0331	pCi/g	03/22/16 10:28	04/12/16 07:02	1

Client Sample ID: L04-03-22-P-S-S-00

Lab Sample ID: 160-16598-16

Date Collected: 03/17/16 14:12

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.877		0.101	0.135		0.0724	pCi/g	03/22/16 10:28	04/12/16 07:04	1
Bismuth 212	1.39		0.339	0.369		0.245	pCi/g	03/22/16 10:28	04/12/16 07:04	1
Bismuth 214	0.708		0.0914	0.117		0.0679	pCi/g	03/22/16 10:28	04/12/16 07:04	1
Lead 212	0.838		0.0708	0.130		0.0592	pCi/g	03/22/16 10:28	04/12/16 07:04	1
Lead 214	0.756		0.0730	0.107		0.0597	pCi/g	03/22/16 10:28	04/12/16 07:04	1
Potassium 40	15.0		0.981	1.82		0.272	pCi/g	03/22/16 10:28	04/12/16 07:04	1
Protactinium 231	0.536	U	0.255	0.262		0.560	pCi/g	03/22/16 10:28	04/12/16 07:04	1
Radium 226	0.708		0.0914	0.117	1.00	0.0679	pCi/g	03/22/16 10:28	04/12/16 07:04	1
Thorium 232	0.877		0.101	0.135		0.0724	pCi/g	03/22/16 10:28	04/12/16 07:04	1
Thorium 234	2.36		0.502	0.560		0.728	pCi/g	03/22/16 10:28	04/12/16 07:04	1
Uranium 235	0.383		0.143	0.149		0.184	pCi/g	03/22/16 10:28	04/12/16 07:04	1
Americium 241	0.00198	U	0.0561	0.0561		0.0948	pCi/g	03/22/16 10:28	04/12/16 07:04	1
Protactinium 234m	5.41		2.36	2.42		2.35	pCi/g	03/22/16 10:28	04/12/16 07:04	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Tl-208	0.279		0.0429	0.0517		0.0338	pCi/g	03/22/16 10:28	04/12/16 07:04	1

Client Sample Results

Client: Westinghouse Electric Company LLC
 Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Client Sample ID: L04-03-23-P-R-S-00

Lab Sample ID: 160-16598-17

Date Collected: 03/17/16 14:23

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.13		0.152	0.191		0.106	pCi/g	03/22/16 10:28	04/12/16 07:44	1
Bismuth 212	1.17		0.368	0.387		0.335	pCi/g	03/22/16 10:28	04/12/16 07:44	1
Bismuth 214	0.915		0.102	0.139		0.0676	pCi/g	03/22/16 10:28	04/12/16 07:44	1
Lead 212	0.956		0.0746	0.144		0.0631	pCi/g	03/22/16 10:28	04/12/16 07:44	1
Lead 214	0.863		0.0885	0.126		0.0695	pCi/g	03/22/16 10:28	04/12/16 07:44	1
Potassium 40	17.5		1.12	2.12		0.287	pCi/g	03/22/16 10:28	04/12/16 07:44	1
Protactinium 231	0.423	U	0.304	0.307		0.992	pCi/g	03/22/16 10:28	04/12/16 07:44	1
Radium 226	0.915		0.102	0.139	1.00	0.0676	pCi/g	03/22/16 10:28	04/12/16 07:44	1
Thorium 232	1.13		0.152	0.191		0.106	pCi/g	03/22/16 10:28	04/12/16 07:44	1
Thorium 234	1.09		0.457	0.471		0.717	pCi/g	03/22/16 10:28	04/12/16 07:44	1
Uranium 235	0.136	U	0.133	0.134		0.216	pCi/g	03/22/16 10:28	04/12/16 07:44	1
Americium 241	-0.000133	U	0.0523	0.0523		0.0886	pCi/g	03/22/16 10:28	04/12/16 07:44	1
Protactinium 234m	3.12	U	2.72	2.73		4.26	pCi/g	03/22/16 10:28	04/12/16 07:44	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Pb-210	1.60		0.562	0.592		0.707	pCi/g	03/22/16 10:28	04/12/16 07:44	1
Tl-208	0.324		0.0470	0.0578		0.0359	pCi/g	03/22/16 10:28	04/12/16 07:44	1

Client Sample ID: L04-03-23-P-R-Q-00

Lab Sample ID: 160-16598-18

Date Collected: 03/17/16 14:23

Matrix: Solid

Date Received: 03/18/16 11:10

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.29		0.118	0.175		0.0889	pCi/g	03/22/16 10:28	04/12/16 07:45	1
Bismuth 212	1.66		0.373	0.410		0.295	pCi/g	03/22/16 10:28	04/12/16 07:45	1
Bismuth 214	1.12		0.0942	0.149		0.0596	pCi/g	03/22/16 10:28	04/12/16 07:45	1
Lead 212	1.07		0.0764	0.159		0.0658	pCi/g	03/22/16 10:28	04/12/16 07:45	1
Lead 214	1.25		0.0869	0.157		0.0712	pCi/g	03/22/16 10:28	04/12/16 07:45	1
Potassium 40	21.0		1.08	2.38		0.294	pCi/g	03/22/16 10:28	04/12/16 07:45	1
Protactinium 231	-0.555	U	0.713	0.715		1.18	pCi/g	03/22/16 10:28	04/12/16 07:45	1
Radium 226	1.12		0.0942	0.149	1.00	0.0596	pCi/g	03/22/16 10:28	04/12/16 07:45	1
Thorium 232	1.29		0.118	0.175		0.0889	pCi/g	03/22/16 10:28	04/12/16 07:45	1
Thorium 234	0.988		0.257	0.277		0.720	pCi/g	03/22/16 10:28	04/12/16 07:45	1
Uranium 235	0.269		0.142	0.144		0.178	pCi/g	03/22/16 10:28	04/12/16 07:45	1
Americium 241	0.0273	U	0.0511	0.0512		0.0853	pCi/g	03/22/16 10:28	04/12/16 07:45	1
Protactinium 234m	6.61		2.73	2.80		4.54	pCi/g	03/22/16 10:28	04/12/16 07:45	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Pb-210	1.52		0.570	0.598		0.706	pCi/g	03/22/16 10:28	04/12/16 07:45	1
Tl-208	0.370		0.0434	0.0577		0.0334	pCi/g	03/22/16 10:28	04/12/16 07:45	1

TestAmerica St. Louis

QC Sample Results

Client: Westinghouse Electric Company LLC
 Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-241600/1-A
Matrix: Solid
Analysis Batch: 245575

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 241600

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.01013	U	0.0228	0.0229		0.0466	pCi/g	03/22/16 10:28	04/12/16 07:00	1
Bismuth 212	0.03073	U	0.105	0.105		0.191	pCi/g	03/22/16 10:28	04/12/16 07:00	1
Bismuth 214	-0.003603	U	0.0305	0.0305		0.0341	pCi/g	03/22/16 10:28	04/12/16 07:00	1
Lead 212	-0.009132	U	14.8	14.8		0.0228	pCi/g	03/22/16 10:28	04/12/16 07:00	1
Lead 214	-0.001956	U	0.0170	0.0170		0.0269	pCi/g	03/22/16 10:28	04/12/16 07:00	1
Potassium 40	0.02283	U	0.117	0.117		0.241	pCi/g	03/22/16 10:28	04/12/16 07:00	1
Protactinium 231	0.04173	U	0.126	0.126		0.300	pCi/g	03/22/16 10:28	04/12/16 07:00	1
Radium 226	-0.003603	U	0.0305	0.0305	1.00	0.0341	pCi/g	03/22/16 10:28	04/12/16 07:00	1
Thorium 232	0.01013	U	0.0228	0.0229		0.0466	pCi/g	03/22/16 10:28	04/12/16 07:00	1
Thorium 234	-0.01614	U	0.163	0.163		0.270	pCi/g	03/22/16 10:28	04/12/16 07:00	1
Uranium 235	0.01791	U	0.0357	0.0357		0.0633	pCi/g	03/22/16 10:28	04/12/16 07:00	1
Americium 241	-0.0000628	U	0.0122	0.0122		0.0222	pCi/g	03/22/16 10:28	04/12/16 07:00	1
Protactinium 234m	0.1364	U	0.981	0.981		2.02	pCi/g	03/22/16 10:28	04/12/16 07:00	1
Other Detected Radionuclides	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Other Detected Radionuclide	None						pCi/g	03/22/16 10:28	04/12/16 07:00	1

Lab Sample ID: LCS 160-241600/2-A
Matrix: Solid
Analysis Batch: 245578

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 241600

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Americium 241	101	104.1		10.9		0.500	pCi/g	103	87 - 116
Cesium 137	34.1	37.10		3.83		0.141	pCi/g	109	87 - 120
Cobalt 60	31.6	34.04		3.37		0.0786	pCi/g	108	87 - 115

Lab Sample ID: 160-16598-15 DU
Matrix: Solid
Analysis Batch: 245575

Client Sample ID: L04-03-20-P-R-S-00
Prep Type: Total/NA
Prep Batch: 241600

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Actinium 228	1.10		0.9401		0.142		0.0839	pCi/g	0.52	1
Bismuth 212	1.44		1.041		0.292		0.330	pCi/g	0.53	1
Bismuth 214	0.978		0.9719		0.135		0.0571	pCi/g	0.02	1
Lead 212	1.05		0.9060		0.138		0.0623	pCi/g	0.50	1
Lead 214	1.15		1.010		0.132		0.0627	pCi/g	0.51	1
Potassium 40	19.9		16.47		1.92		0.215	pCi/g	0.82	1
Protactinium 231	0.472	U	-0.5970	U F	0.644		1.05	pCi/g	1.22	1
Radium 226	0.978		0.9719		0.135	1.00	0.0571	pCi/g	0.02	1
Thorium 232	1.10		0.9401		0.142		0.0839	pCi/g	0.52	1
Thorium 234	1.19		1.165		0.467		0.709	pCi/g	0.03	1
Uranium 235	0.0785	U	0.1347		0.0928		0.127	pCi/g	0.27	1

TestAmerica St. Louis

QC Sample Results

Client: Westinghouse Electric Company LLC
 Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: 160-16598-15 DU
Matrix: Solid
Analysis Batch: 245575

Client Sample ID: L04-03-20-P-R-S-00
Prep Type: Total/NA
Prep Batch: 241600

Analyte	Sample	Sample	DU	DU	Total	RL	MDC	Unit	RER	RER	Limit
	Result	Qual	Result	Qual	Uncert. (2σ+/-)						
Americium 241	-0.00010	U	0.001789	U	0.0508		0.0856	pCi/g	0.02		1
	9										
Protactinium 234m	4.37		0.8543	U	2.52		4.37	pCi/g	0.67		1
Other Detected Radionuclides	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER	Limit
Pb-210	1.18		1.346		0.583		0.712	pCi/g	0.14		1
Tl-208	0.337		0.3056		0.0527		0.0323	pCi/g	0.29		1

Lab Sample ID: MB 160-241603/1-A
Matrix: Solid
Analysis Batch: 245577

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 241603

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	0.01390	U	0.0245	0.0246		0.0427	pCi/g	03/22/16 09:58	04/12/16 07:47	1
Bismuth 212	0.0000	U	0.0220	0.0220		0.0809	pCi/g	03/22/16 09:58	04/12/16 07:47	1
Bismuth 214	0.006176	U	0.0204	0.0204		0.0315	pCi/g	03/22/16 09:58	04/12/16 07:47	1
Lead 212	0.001116	U	0.0108	0.0108		0.0213	pCi/g	03/22/16 09:58	04/12/16 07:47	1
Lead 214	0.001053	U	0.0135	0.0135		0.0275	pCi/g	03/22/16 09:58	04/12/16 07:47	1
Potassium 40	-0.07645	U	3.06	3.06		0.192	pCi/g	03/22/16 09:58	04/12/16 07:47	1
Protactinium 231	-0.04514	U	0.220	0.220		0.391	pCi/g	03/22/16 09:58	04/12/16 07:47	1
Radium 226	0.006176	U	0.0204	0.0204	1.00	0.0315	pCi/g	03/22/16 09:58	04/12/16 07:47	1
Thorium 232	0.01390	U	0.0245	0.0246		0.0427	pCi/g	03/22/16 09:58	04/12/16 07:47	1
Thorium 234	-0.02621	U	0.153	0.153		0.250	pCi/g	03/22/16 09:58	04/12/16 07:47	1
Uranium 235	0.01365	U	0.0358	0.0358		0.0749	pCi/g	03/22/16 09:58	04/12/16 07:47	1
Americium 241	0.007406	U	0.0126	0.0126		0.0213	pCi/g	03/22/16 09:58	04/12/16 07:47	1
Protactinium 234m	-0.2822	U	11.3	11.3		3.84	pCi/g	03/22/16 09:58	04/12/16 07:47	1
Other Detected Radionuclides	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Other Detected Radionuclide	None						pCi/g	03/22/16 09:58	04/12/16 07:47	1

Lab Sample ID: LCS 160-241603/2-A
Matrix: Solid
Analysis Batch: 245575

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 241603

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec.
				Uncert. (2σ+/-)					Limits
Americium 241	101	99.86		10.4		0.502	pCi/g	99	87 - 116
Cesium 137	34.1	32.96		3.45		0.155	pCi/g	97	87 - 120
Cobalt 60	31.6	29.77		3.00		0.121	pCi/g	94	87 - 115

TestAmerica St. Louis

QC Sample Results

Client: Westinghouse Electric Company LLC
 Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: 160-16595-A-1-I DU
Matrix: Solid
Analysis Batch: 245577

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 241603

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Actinium 228	0.928		1.171		0.191		0.118	pCi/g	0.69	1
Bismuth 212	1.74		1.237		0.433		0.378	pCi/g	0.50	1
Bismuth 214	1.16		1.030		0.144		0.0601	pCi/g	0.41	1
Lead 212	1.07		1.043		0.152		0.0550	pCi/g	0.1	1
Lead 214	1.19		1.135		0.143		0.0632	pCi/g	0.19	1
Potassium 40	17.6		18.35		2.17		0.366	pCi/g	0.18	1
Protactinium 231	0.636	U	-0.5988	U F	0.656		1.07	pCi/g	1.29	1
Radium 226	1.16		1.030		0.144	1.00	0.0601	pCi/g	0.41	1
Thorium 232	0.928		1.171		0.191		0.118	pCi/g	0.69	1
Thorium 234	0.831	U	1.053		0.289		0.779	pCi/g	0.37	1
Uranium 235	0.203		0.3091		0.166		0.175	pCi/g	0.35	1
Americium 241	0.0171	U	0.03742	U	0.0543		0.0896	pCi/g	0.18	1
Protactinium 234m	0.0391	U	1.009	U	1.62		4.56	pCi/g	0.20	1

QC Association Summary

Client: Westinghouse Electric Company LLC
 Project/Site: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16598-2

Rad

Leach Batch: 241252

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16595-A-1-I DU	Duplicate	Total/NA	Solid	Dry and Grind	
160-16598-1	L04-03-01-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-16598-2	L04-03-02-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-16598-3	L04-03-04-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-16598-4	L04-03-05-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-16598-5	L04-03-07-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-16598-6	L04-03-08-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-16598-7	L04-03-10-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-16598-8	L04-03-11-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-16598-9	L04-03-13-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-16598-10	L04-03-14-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-16598-11	L04-03-14-P-R-Q-00	Total/NA	Solid	Dry and Grind	
160-16598-12	L04-03-16-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-16598-13	L04-03-17-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-16598-14	L04-03-19-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-16598-15	L04-03-20-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-16598-15 DU	L04-03-20-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-16598-16	L04-03-22-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-16598-17	L04-03-23-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-16598-18	L04-03-23-P-R-Q-00	Total/NA	Solid	Dry and Grind	

Prep Batch: 241600

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16598-15	L04-03-20-P-R-S-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-15 DU	L04-03-20-P-R-S-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-16	L04-03-22-P-S-S-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-17	L04-03-23-P-R-S-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-18	L04-03-23-P-R-Q-00	Total/NA	Solid	Fill_Geo-21	241252
LCS 160-241600/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
MB 160-241600/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	

Prep Batch: 241603

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16595-A-1-I DU	Duplicate	Total/NA	Solid	Fill_Geo-21	241252
160-16598-1	L04-03-01-P-S-S-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-2	L04-03-02-P-R-S-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-3	L04-03-04-P-S-S-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-4	L04-03-05-P-R-S-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-5	L04-03-07-P-S-S-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-6	L04-03-08-P-R-S-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-7	L04-03-10-P-S-S-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-8	L04-03-11-P-R-S-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-9	L04-03-13-P-S-S-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-10	L04-03-14-P-R-S-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-11	L04-03-14-P-R-Q-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-12	L04-03-16-P-S-S-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-13	L04-03-17-P-R-S-00	Total/NA	Solid	Fill_Geo-21	241252
160-16598-14	L04-03-19-P-S-S-00	Total/NA	Solid	Fill_Geo-21	241252
LCS 160-241603/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
MB 160-241603/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	

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