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: 160-17118-1
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:
5/2/2016 1:08:40 PM

Ivan Vania, Project Manager II
(314)298-8566
ivan.vania@testamericainc.com

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Job ID: 160-17118-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Westinghouse Electric Company LLC

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

Report Number: 160-17118-1

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

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 4/26/2016 10:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 19.0º C, 19.0º C and 19.0º C.

TECHNETIUM-99 (ICPMS)

Samples L08-14-18-T-E-B-00 (160-17118-1), L08-14-19-T-R-B-00 (160-17118-2), L08-14-20-T-R-B-00 (160-17118-3), L09-01-25-P-S-B-00 (160-17118-4), L09-02-19-P-S-S-00 (160-17118-5), L09-02-20-P-R-S-00 (160-17118-6), L09-02-21-P-E-S-00 (160-17118-7), L09-02-22-P-S-S-00 (160-17118-8), L09-02-23-P-R-S-00 (160-17118-9), L09-02-24-P-E-S-00 (160-17118-10), L09-02-25-P-S-B-00 (160-17118-11), L09-02-26-P-S-B-00 (160-17118-12) and L09-03-25-P-E-B-00 (160-17118-13) were analyzed for Technetium-99 (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 04/26/2016 and analyzed on 04/28/2016.

Preparation Batch 160-247984, Analytical Batch 160-248493:
The carrier concentration was outside QC limits in the CCV. The target analyte concentration was within acceptable limits, showing that there was no bias. Original results will be reported. (CCV 160-248493/47)

Job ID: 160-17118-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

Preparation Batch 160-247984, Analytical Batch 160-248494:
The carrier concentration was outside QC limits in the CCV. The target analyte concentration was within acceptable limits, showing that there was no bias. Original results will be reported. (CCV 160-248494/47)

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

PERCENT SOLIDS

Samples L08-14-18-T-E-B-00 (160-17118-1), L08-14-19-T-R-B-00 (160-17118-2), L08-14-20-T-R-B-00 (160-17118-3), L09-01-25-P-S-B-00 (160-17118-4), L09-02-19-P-S-S-00 (160-17118-5), L09-02-20-P-R-S-00 (160-17118-6), L09-02-21-P-E-S-00 (160-17118-7), L09-02-22-P-S-S-00 (160-17118-8), L09-02-23-P-R-S-00 (160-17118-9), L09-02-24-P-E-S-00 (160-17118-10), L09-02-25-P-S-B-00 (160-17118-11), L09-02-26-P-S-B-00 (160-17118-12) and L09-03-25-P-E-B-00 (160-17118-13) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 04/27/2016.

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

CESIUM-137 & OTHER GAMMA EMITTERS (GS)

Samples L08-14-18-T-E-B-00 (160-17118-1), L08-14-19-T-R-B-00 (160-17118-2), L08-14-20-T-R-B-00 (160-17118-3), L09-01-25-P-S-B-00 (160-17118-4), L09-02-19-P-S-S-00 (160-17118-5), L09-02-20-P-R-S-00 (160-17118-6), L09-02-21-P-E-S-00 (160-17118-7), L09-02-22-P-S-S-00 (160-17118-8), L09-02-23-P-R-S-00 (160-17118-9), L09-02-24-P-E-S-00 (160-17118-10), L09-02-25-P-S-B-00 (160-17118-11), L09-02-26-P-S-B-00 (160-17118-12) and L09-03-25-P-E-B-00 (160-17118-13) were analyzed for Cesium-137 & Other Gamma Emitters (GS) in accordance with DOE GA-01-R. The samples were leached on 04/26/2016, prepared on 04/28/2016 and analyzed on 04/29/2016 and 05/01/2016.

Preparation Batch 160-248208:
Radium-226 is reported in these samples at the clients request. Radium-226 is reported from the 609.31 keV line of bismuth-214. Because the samples have not had 21-days of ingrowth, the activity for radium-226 is an estimated value and may be biased low. This bias is caused by the disruption of secular equilibrium between radium-226 and bismuth-214 by the loss of radon-222 during sample preparation. The samples are reported with the MDC achieved. L08-14-18-T-E-B-00 (160-17118-1), L08-14-19-T-R-B-00 (160-17118-2), L08-14-20-T-R-B-00 (160-17118-3), L09-01-25-P-S-B-00 (160-17118-4), L09-02-19-P-S-S-00 (160-17118-5), L09-02-20-P-R-S-00 (160-17118-6), L09-02-21-P-E-S-00 (160-17118-7), L09-02-22-P-S-S-00 (160-17118-8), L09-02-23-P-R-S-00 (160-17118-9), L09-02-24-P-E-S-00 (160-17118-10), L09-02-25-P-S-B-00 (160-17118-11), L09-02-26-P-S-B-00 (160-17118-12), L09-03-25-P-E-B-00 (160-17118-13), (LCS 160-248208/2-A), (MB 160-248208/1-A) and (160-17118-A-1-G 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 Cutody ID No. F-042616-01 **Page** 1/1

Project Name:
Westinghouse Electric Company

Contact Person:
Clark Evers

Phone Number:
314-810-3336

Sampler Name
Donte Love

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)

Sample ID	Date	Time	Matrix	Comp (C) or Grab (G)	Requested Analysis: Gamma Spec	Isotopic Uranium	Tc-99	Gamma Spec (21 day ingrow for Ra-226)						Total Containers	Remarks
L08-14-18-T-E-B-00	4/19/2016	9:15	S	G	X		X	X						1	LSA 08-14 Sidewall Bias
L08-14-19-T-R-B-00	4/19/2016	9:30	S	G	X		X	X						1	LSA 08-14 Bias
L08-14-20-T-R-B-00	4/19/2016	9:35	S	G	X		X	X						1	LSA 08-14 Bias

160-17118 Chain of Custody

Relinquished by: C. Gorsuch	Date/Time 4-26-16 0915	Received by: K Gaff 3815	Date/Time 4-26-16 0915	Total 3	Cooler Temperature: Ambient
Company Name: WEC		Company Name: CROSSROADS		Cooler ID: 0426-01	Shipper and Number:
Received by:	Date/Time	Relinquished by:	Date/Time	Comments: N/A	
Company Name:		Company Name:			
Relinquished by: K Gaff 3815	Date/Time 4-26-16 1045	Received by: Jill Clark	Date/Time 4-26-14 1045	Verified By: C. Gorsuch 4-26-16	
Company Name: CROSS ROADS		Company Name: TA STL			

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 Cutody ID No. F-042616-03 **Page** 1/1

Project Name:
Westinghouse Electric Company

Contact Person:
Clark Evers

Phone Number:
314-810-3336

Sampler Name
Donte Love

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)

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
					Requested Analysis										
L09-01-25-P-S-B-00	4/20/2016	8:15	S	G	X		X	X						1	LSA 09-01 Bias

Relinquished by: C. Gorsuch	Date/Time 4-26-16 0915	Received by: K. Gill 3815	Date/Time 4-26-16 0915	Total 1	Cooler Temperature: Ambient
Company Name: WEC		Company Name: CROSSROADS		Cooler ID: 0426-01	Shipper and Number:
Received by:	Date/Time	Relinquished by:	Date/Time	Comments: N/A	
Company Name:		Company Name:			
Relinquished by: K. Gill 3815	Date/Time 4-26-16 10:45	Received by: Jill Clarke	Date/Time 4.26.16 1045	Verified By: C. Gorsuch 4-26-16	
Company Name: Cross Roads		Company Name: TA STL			

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 Cutody ID No. F-042616-04 **Page** 1/1

Project Name:
Westinghouse Electric Company

Contact Person:
Clark Evers

Phone Number:
314-810-3336

Sampler Name
Donte Love

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)

Sample ID	Date	Time	Matrix	Comp (C) or Grab (G)	Requested Analysis: Gamma Spec	Isotopic Uranium	Tc-99	Gamma Spec (21 day ingrow for Ra-226)						Total Containers	Remarks
L09-02-19-P-S-S-00	4/22/2016	9:00	S	G	X		X	X						1	LSA 09-02
L09-02-20-P-R-S-00	4/22/2016	9:20	S	C	X		X	X						1	LSA 09-02
L09-02-21-P-E-S-00	4/22/2016	9:25	S	G	X		X	X						1	LSA 09-02
L09-02-22-P-S-S-00	4/22/2016	10:00	S	G	X		X	X						1	LSA 09-02
L09-02-23-P-R-S-00	4/22/2016	10:15	S	C	X		X	X						1	LSA 09-02
L09-02-24-P-E-S-00	4/22/2016	10:20	S	G	X		X	X						1	LSA 09-02
L09-02-25-P-S-B-00	4/22/2016	10:25	S	G	X		X	X						1	LSA 09-02 Bias
L09-02-26-P-S-B-00	4/22/2016	10:30	S	G	X		X	X						1	LSA 09-02 Sidewall Bias

Relinquished by: Donte Love / Clark Evers	Date/Time 4-26-16 0915	Received by: RGM 3815	Date/Time 4-26-16 0915	Total 8	Cooler Temperature: Ambient
Company Name: WEC		Company Name: CROSSROADS		Cooler ID: 0426-01/02	Shipper and Number:
Received by:	Date/Time	Relinquished by:	Date/Time	Comments: N/A	
Company Name:		Company Name:			
Relinquished by: RGM 3815	Date/Time 4-26-16 1045	Received by: Jill Clarke	Date/Time 4-26-16 1045	Verified By: C. Goesse 4-26-16	
Company Name: Cross Roads		Company Name: TA SR			

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 Cutody ID No. F-042616-02 **Page** 1/1

Project Name:
Westinghouse Electric Company

Contact Person:
Clark Evers

Phone Number:
314-810-3336

Sampler Name
Jahmai Williams

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)

Sample ID	Date	Time	Matrix	Comp (C) or Grab (G)	Requested Analysis: Gamma Spec	Isotopic Uranium	Tc-99	Gamma Spec (21 day ingrow for Ra-226)						Total Containers	Remarks
L09-03-25-P-E-B-00	4/14/2016	15:00	S	G	X		X	X						1	LSA 09-03 Sidewall Bias

Relinquished by: Gorsuch / Company Name: WEC	Date/Time 4-26-16 0915	Received by: RGM 3815 / Company Name: CROSSROADS	Date/Time 4-26-16 0915	Total 1	Cooler Temperature: Ambient
				Cooler ID: 0426-01	Shipper and Number:
Received by: / Company Name:	Date/Time	Relinquished by: / Company Name:	Date/Time	Comments: N/A	
Relinquished by: RGM 3815 / Company Name: CROSS ROADS	Date/Time 4-26-16 1045	Received by: [signature] / Company Name: TASR	Date/Time 4-26-16 1045	Verified By: C. Gorsuch [signature] 4-26-16	

Login Sample Receipt Checklist

Client: Westinghouse Electric Company LLC

Job Number: 160-17118-1

Login Number: 17118
List Number: 1
Creator: Clarke, Jill C

List Source: TestAmerica St. Louis

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.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (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	

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Rad

Qualifier	Qualifier Description
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)

Method Summary

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

TestAmerica Job ID: 160-17118-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS), Tc-99	SW846	TAL SL
Moisture	Percent Moisture	EPA	TAL SL
6020A	Metals (ICP/MS), Tc-99 in Activity	SW846	TAL SL
GA-01-R	Cesium-137 & Other Gamma Emitters (GS)	DOE	TAL SL

Protocol References:

DOE = U.S. Department of Energy

EPA = US Environmental Protection Agency

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

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: 160-17118-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-17118-1	L08-14-18-T-E-B-00	Solid	04/19/16 09:15	04/26/16 10:45
160-17118-2	L08-14-19-T-R-B-00	Solid	04/19/16 09:30	04/26/16 10:45
160-17118-3	L08-14-20-T-R-B-00	Solid	04/19/16 09:35	04/26/16 10:45
160-17118-4	L09-01-25-P-S-B-00	Solid	04/20/16 08:15	04/26/16 10:45
160-17118-5	L09-02-19-P-S-S-00	Solid	04/22/16 09:00	04/26/16 10:45
160-17118-6	L09-02-20-P-R-S-00	Solid	04/22/16 09:20	04/26/16 10:45
160-17118-7	L09-02-21-P-E-S-00	Solid	04/22/16 09:25	04/26/16 10:45
160-17118-8	L09-02-22-P-S-S-00	Solid	04/22/16 10:00	04/26/16 10:45
160-17118-9	L09-02-23-P-R-S-00	Solid	04/22/16 10:15	04/26/16 10:45
160-17118-10	L09-02-24-P-E-S-00	Solid	04/22/16 10:20	04/26/16 10:45
160-17118-11	L09-02-25-P-S-B-00	Solid	04/22/16 10:25	04/26/16 10:45
160-17118-12	L09-02-26-P-S-B-00	Solid	04/22/16 10:30	04/26/16 10:45
160-17118-13	L09-03-25-P-E-B-00	Solid	04/14/16 15:00	04/26/16 10:45

Client Sample ID: L08-14-18-T-E-B-00

Lab Sample ID: 160-17118-1
Date Collected: 04/19/16 09:15
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	**1.14**		0.172	0.208		0.129	pCi/g	04/28/16 09:00	04/29/16 15:01	1
Americium 241	-0.00451	U	0.0678	0.0678		0.115	pCi/g	04/28/16 09:00	04/29/16 15:01	1
Bismuth 212	**1.32**		0.390	0.414		0.318	pCi/g	04/28/16 09:00	04/29/16 15:01	1
Bismuth 214	**0.782**		0.117	0.143		0.0760	pCi/g	04/28/16 09:00	04/29/16 15:01	1
Lead 212	**0.987**		0.0943	0.159		0.0797	pCi/g	04/28/16 09:00	04/29/16 15:01	1
Lead 214	**0.862**		0.0949	0.130		0.0919	pCi/g	04/28/16 09:00	04/29/16 15:01	1
Potassium 40	**18.5**		1.39	2.35		0.263	pCi/g	04/28/16 09:00	04/29/16 15:01	1
Protactinium 231	0.458	U	0.279	0.284		1.34	pCi/g	04/28/16 09:00	04/29/16 15:01	1
Radium 226	**0.782**		0.117	0.143	1.00	0.0760	pCi/g	04/28/16 09:00	04/29/16 15:01	1
Thorium 234	**2.18**		0.781	0.814	1.00	0.943	pCi/g	04/28/16 09:00	04/29/16 15:01	1
Uranium 235	0.0593	U	0.120	0.120		0.223	pCi/g	04/28/16 09:00	04/29/16 15:01	1
Protactinium 234m	0.642	U	4.06	4.06		7.21	pCi/g	04/28/16 09:00	04/29/16 15:01	1
Thorium 232	**1.14**		0.172	0.208		0.129	pCi/g	04/28/16 09:00	04/29/16 15:01	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.349*		*0.0535*	*0.0646*		*0.0374*	*pCi/g*	*04/28/16 09:00*	*04/29/16 15:01*	*1*

Client Sample ID: L08-14-18-T-E-B-00

Lab Sample ID: 160-17118-1
Date Collected: 04/19/16 09:15
Matrix: Solid
Date Received: 04/26/16 10:45
Percent Solids: 83.8

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	**0.000092**		0.000063	0.000019	mg/Kg	☼	04/26/16 15:27	04/28/16 13:32	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	**1.57**		0.210	0.255	1.26	0.215	pCi/g	04/26/16 15:27	04/28/16 13:32	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*95*		*30 - 110*	*04/26/16 15:27*	*04/28/16 13:32*	*1*

Client Sample ID: L08-14-19-T-R-B-00

Lab Sample ID: 160-17118-2
Date Collected: 04/19/16 09:30
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	**1.00**		0.139	0.173		0.112	pCi/g	04/28/16 09:00	04/29/16 15:51	1
Americium 241	0.0403	U	0.0585	0.0587		0.0968	pCi/g	04/28/16 09:00	04/29/16 15:51	1
Bismuth 212	**1.79**		0.498	0.532		0.380	pCi/g	04/28/16 09:00	04/29/16 15:51	1
Bismuth 214	**0.688**		0.0992	0.122		0.0688	pCi/g	04/28/16 09:00	04/29/16 15:51	1
Lead 212	**1.01**		0.0804	0.154		0.0638	pCi/g	04/28/16 09:00	04/29/16 15:51	1

Client Sample ID: L08-14-19-T-R-B-00

Lab Sample ID: 160-17118-2
Date Collected: 04/19/16 09:30
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Lead 214	**0.792**		0.0900	0.122		0.0761	pCi/g	04/28/16 09:00	04/29/16 15:51	1
Potassium 40	**15.9**		1.15	2.00		0.209	pCi/g	04/28/16 09:00	04/29/16 15:51	1
Protactinium 231	-0.603	U	0.752	0.755		1.24	pCi/g	04/28/16 09:00	04/29/16 15:51	1
Radium 226	**0.688**		0.0992	0.122	1.00	0.0688	pCi/g	04/28/16 09:00	04/29/16 15:51	1
Thorium 234	**4.05**		0.645	0.772	1.00	0.899	pCi/g	04/28/16 09:00	04/29/16 15:51	1
Uranium 235	**1.45**		0.257	0.296		0.251	pCi/g	04/28/16 09:00	04/29/16 15:51	1
Protactinium 234m	3.85	U	3.58	3.60		5.70	pCi/g	04/28/16 09:00	04/29/16 15:51	1
Thorium 232	**1.00**		0.139	0.173		0.112	pCi/g	04/28/16 09:00	04/29/16 15:51	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.305*		*0.0486*	*0.0580*		*0.0379*	*pCi/g*	*04/28/16 09:00*	*04/29/16 15:51*	*1*

Client Sample ID: L08-14-19-T-R-B-00

Lab Sample ID: 160-17118-2
Date Collected: 04/19/16 09:30
Matrix: Solid
Date Received: 04/26/16 10:45
Percent Solids: 86.2

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	**0.000073**		0.000062	0.000019	mg/Kg	☼	04/26/16 15:27	04/28/16 13:45	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	**1.26**		0.0800	0.141	1.24	0.212	pCi/g	04/26/16 15:27	04/28/16 13:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*95*		*30 - 110*	*04/26/16 15:27*	*04/28/16 13:45*	*1*

Client Sample ID: L08-14-20-T-R-B-00

Lab Sample ID: 160-17118-3
Date Collected: 04/19/16 09:35
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	**1.20**		0.167	0.207		0.0904	pCi/g	04/28/16 09:00	04/29/16 16:29	1
Americium 241	-0.0226	U	0.0566	0.0567		0.0946	pCi/g	04/28/16 09:00	04/29/16 16:29	1
Bismuth 212	**0.662**		0.310	0.318		0.436	pCi/g	04/28/16 09:00	04/29/16 16:29	1
Bismuth 214	**0.656**		0.0876	0.111		0.0633	pCi/g	04/28/16 09:00	04/29/16 16:29	1
Lead 212	**0.933**		0.0782	0.144		0.0833	pCi/g	04/28/16 09:00	04/29/16 16:29	1
Lead 214	**0.710**		0.0839	0.112		0.0675	pCi/g	04/28/16 09:00	04/29/16 16:29	1
Potassium 40	**16.6**		1.16	2.06		0.334	pCi/g	04/28/16 09:00	04/29/16 16:29	1
Protactinium 231	-0.458	U	0.637	0.639		1.05	pCi/g	04/28/16 09:00	04/29/16 16:29	1
Radium 226	**0.656**		0.0876	0.111	1.00	0.0633	pCi/g	04/28/16 09:00	04/29/16 16:29	1
Thorium 234	0.642	U	0.284	0.292	1.00	0.724	pCi/g	04/28/16 09:00	04/29/16 16:29	1

Client Sample ID: L08-14-20-T-R-B-00

Lab Sample ID: 160-17118-3
Date Collected: 04/19/16 09:35
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Uranium 235	0.108	U	0.124	0.124		0.216	pCi/g	04/28/16 09:00	04/29/16 16:29	1
Protactinium 234m	0.257	U	2.64	2.64		4.76	pCi/g	04/28/16 09:00	04/29/16 16:29	1
Thorium 232	**1.20**		0.167	0.207		0.0904	pCi/g	04/28/16 09:00	04/29/16 16:29	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.334*		*0.0439*	*0.0560*		*0.0311*	*pCi/g*	*04/28/16 09:00*	*04/29/16 16:29*	*1*

Client Sample ID: L08-14-20-T-R-B-00

Lab Sample ID: 160-17118-3
Date Collected: 04/19/16 09:35
Matrix: Solid
Date Received: 04/26/16 10:45
Percent Solids: 82.9

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000063	0.000019	mg/Kg	☼	04/26/16 15:27	04/28/16 13:49	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.156	U	0.0798	0.0811	1.26	0.216	pCi/g	04/26/16 15:27	04/28/16 13:49	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*96*		*30 - 110*	*04/26/16 15:27*	*04/28/16 13:49*	*1*

Client Sample ID: L09-01-25-P-S-B-00

Lab Sample ID: 160-17118-4
Date Collected: 04/20/16 08:15
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	**1.03**		0.122	0.161		0.0977	pCi/g	04/28/16 09:00	04/29/16 16:30	1
Americium 241	-0.0242	U	0.0627	0.0628		0.105	pCi/g	04/28/16 09:00	04/29/16 16:30	1
Bismuth 212	**1.17**		0.362	0.382		0.295	pCi/g	04/28/16 09:00	04/29/16 16:30	1
Bismuth 214	**0.767**		0.104	0.131		0.0695	pCi/g	04/28/16 09:00	04/29/16 16:30	1
Lead 212	**1.02**		0.0936	0.162		0.0800	pCi/g	04/28/16 09:00	04/29/16 16:30	1
Lead 214	**0.825**		0.0891	0.124		0.0604	pCi/g	04/28/16 09:00	04/29/16 16:30	1
Potassium 40	**13.3**		1.10	1.75		0.346	pCi/g	04/28/16 09:00	04/29/16 16:30	1
Protactinium 231	0.431	U	0.279	0.283		1.11	pCi/g	04/28/16 09:00	04/29/16 16:30	1
Radium 226	**0.767**		0.104	0.131	1.00	0.0695	pCi/g	04/28/16 09:00	04/29/16 16:30	1
Thorium 234	0.646	U	0.271	0.279	1.00	0.810	pCi/g	04/28/16 09:00	04/29/16 16:30	1
Uranium 235	0.0464	U	0.102	0.102		0.244	pCi/g	04/28/16 09:00	04/29/16 16:30	1
Protactinium 234m	0.000	U	0.769	0.769		7.78	pCi/g	04/28/16 09:00	04/29/16 16:30	1
Thorium 232	**1.03**		0.122	0.161		0.0977	pCi/g	04/28/16 09:00	04/29/16 16:30	1

Client Sample ID: L09-01-25-P-S-B-00

Lab Sample ID: 160-17118-4
Date Collected: 04/20/16 08:15
Matrix: Solid
Date Received: 04/26/16 10:45

Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.336		0.0505	0.0614		0.0370	pCi/g	04/28/16 09:00	04/29/16 16:30	1

Client Sample ID: L09-01-25-P-S-B-00

Lab Sample ID: 160-17118-4
Date Collected: 04/20/16 08:15
Matrix: Solid
Date Received: 04/26/16 10:45
Percent Solids: 82.7

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000066	0.000020	mg/Kg	☼	04/26/16 15:27	04/28/16 13:53	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.0273	U	0.0419	0.0420	1.33	0.227	pCi/g	04/26/16 15:27	04/28/16 13:53	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	90		30 - 110	04/26/16 15:27	04/28/16 13:53	1

Client Sample ID: L09-02-19-P-S-S-00

Lab Sample ID: 160-17118-5
Date Collected: 04/22/16 09:00
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.0192	U	0.0225	0.0226		0.0383	pCi/g	04/28/16 09:00	04/29/16 17:08	1
Americium 241	0.00471	U	0.0133	0.0133		0.0229	pCi/g	04/28/16 09:00	04/29/16 17:08	1
Bismuth 212	-0.00306	U	0.0990	0.0990		0.191	pCi/g	04/28/16 09:00	04/29/16 17:08	1
Bismuth 214	**0.139**		0.0292	0.0325		0.0192	pCi/g	04/28/16 09:00	04/29/16 17:08	1
Lead 212	**0.0327**		0.0185	0.0190		0.0236	pCi/g	04/28/16 09:00	04/29/16 17:08	1
Lead 214	**0.0837**		0.0252	0.0267		0.0665	pCi/g	04/28/16 09:00	04/29/16 17:08	1
Potassium 40	**0.995**		0.244	0.264		0.165	pCi/g	04/28/16 09:00	04/29/16 17:08	1
Protactinium 231	0.0251	U	0.0359	0.0360		0.354	pCi/g	04/28/16 09:00	04/29/16 17:08	1
Radium 226	**0.139**		0.0292	0.0325	1.00	0.0192	pCi/g	04/28/16 09:00	04/29/16 17:08	1
Thorium 234	0.0917	U	0.0867	0.0872	1.00	0.255	pCi/g	04/28/16 09:00	04/29/16 17:08	1
Uranium 235	0.0576	U	0.0365	0.0369		0.0600	pCi/g	04/28/16 09:00	04/29/16 17:08	1
Protactinium 234m	0.541	U	0.713	0.715		2.41	pCi/g	04/28/16 09:00	04/29/16 17:08	1
Thorium 232	0.0192	U	0.0225	0.0226		0.0383	pCi/g	04/28/16 09:00	04/29/16 17:08	1

Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Other Detected Radionuclide	None						pCi/g	04/28/16 09:00	04/29/16 17:08	1

Client Sample ID: L09-02-19-P-S-S-00

Lab Sample ID: 160-17118-5
Date Collected: 04/22/16 09:00
Matrix: Solid
Date Received: 04/26/16 10:45
Percent Solids: 94.6

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000052	0.000016	mg/Kg	☼	04/26/16 15:27	04/28/16 13:58	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.0660	U	0.0371	0.0376	1.04	0.178	pCi/g	04/26/16 15:27	04/28/16 13:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*99*		*30 - 110*	*04/26/16 15:27*	*04/28/16 13:58*	*1*

Client Sample ID: L09-02-20-P-R-S-00

Lab Sample ID: 160-17118-6
Date Collected: 04/22/16 09:20
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	**0.101**		0.0409	0.0422		0.0880	pCi/g	04/28/16 09:00	04/29/16 17:07	1
Americium 241	0.00926	U	0.0221	0.0222		0.0375	pCi/g	04/28/16 09:00	04/29/16 17:07	1
Bismuth 212	0.0198	U	0.154	0.154		0.282	pCi/g	04/28/16 09:00	04/29/16 17:07	1
Bismuth 214	**0.195**		0.0485	0.0525		0.0357	pCi/g	04/28/16 09:00	04/29/16 17:07	1
Lead 212	**0.118**		0.0342	0.0375		0.0350	pCi/g	04/28/16 09:00	04/29/16 17:07	1
Lead 214	**0.241**		0.0424	0.0493		0.0363	pCi/g	04/28/16 09:00	04/29/16 17:07	1
Potassium 40	**3.25**		0.488	0.591		0.238	pCi/g	04/28/16 09:00	04/29/16 17:07	1
Protactinium 231	0.127	U	0.155	0.155		0.514	pCi/g	04/28/16 09:00	04/29/16 17:07	1
Radium 226	**0.195**		0.0485	0.0525	1.00	0.0357	pCi/g	04/28/16 09:00	04/29/16 17:07	1
Thorium 234	0.127	U	0.131	0.132	1.00	0.368	pCi/g	04/28/16 09:00	04/29/16 17:07	1
Uranium 235	0.00200	U	0.00611	0.00611		0.105	pCi/g	04/28/16 09:00	04/29/16 17:07	1
Protactinium 234m	-0.601	U	2.09	2.09		3.70	pCi/g	04/28/16 09:00	04/29/16 17:07	1
Thorium 232	**0.101**		0.0409	0.0422		0.0880	pCi/g	04/28/16 09:00	04/29/16 17:07	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Other Detected Radionuclide	*None*						*pCi/g*	*04/28/16 09:00*	*04/29/16 17:07*	*1*

Client Sample ID: L09-02-20-P-R-S-00

Lab Sample ID: 160-17118-6
Date Collected: 04/22/16 09:20
Matrix: Solid
Date Received: 04/26/16 10:45
Percent Solids: 96.9

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000051	0.000015	mg/Kg	☼	04/26/16 15:27	04/28/16 14:02	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.0174	U	0.0246	0.0247	1.02	0.174	pCi/g	04/26/16 15:27	04/28/16 14:02	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	99		30 - 110	04/26/16 15:27	04/28/16 14:02	1

Client Sample ID: L09-02-21-P-E-S-00
Lab Sample ID: 160-17118-7
Date Collected: 04/22/16 09:25
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	**0.132**		0.0409	0.0431		0.0479	pCi/g	04/28/16 09:00	04/29/16 17:51	1
Americium 241	0.00563	U	0.0201	0.0201		0.0344	pCi/g	04/28/16 09:00	04/29/16 17:51	1
Bismuth 212	0.0875	U	0.130	0.130		0.218	pCi/g	04/28/16 09:00	04/29/16 17:51	1
Bismuth 214	**0.171**		0.0340	0.0384		0.0231	pCi/g	04/28/16 09:00	04/29/16 17:51	1
Lead 212	**0.103**		0.0273	0.0304		0.0295	pCi/g	04/28/16 09:00	04/29/16 17:51	1
Lead 214	**0.229**		0.0366	0.0436		0.0352	pCi/g	04/28/16 09:00	04/29/16 17:51	1
Potassium 40	**3.12**		0.415	0.524		0.158	pCi/g	04/28/16 09:00	04/29/16 17:51	1
Protactinium 231	0.141	U	0.112	0.113		0.391	pCi/g	04/28/16 09:00	04/29/16 17:51	1
Radium 226	**0.171**		0.0340	0.0384	1.00	0.0231	pCi/g	04/28/16 09:00	04/29/16 17:51	1
Thorium 234	0.165	U	0.112	0.113	1.00	0.299	pCi/g	04/28/16 09:00	04/29/16 17:51	1
Uranium 235	0.0201	U	0.0424	0.0424		0.0720	pCi/g	04/28/16 09:00	04/29/16 17:51	1
Protactinium 234m	0.212	U	1.39	1.39		2.56	pCi/g	04/28/16 09:00	04/29/16 17:51	1
Thorium 232	**0.132**		0.0409	0.0431		0.0479	pCi/g	04/28/16 09:00	04/29/16 17:51	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Other Detected Radionuclide	*None*						*pCi/g*	*04/28/16 09:00*	*04/29/16 17:51*	*1*

Client Sample ID: L09-02-21-P-E-S-00
Lab Sample ID: 160-17118-7
Date Collected: 04/22/16 09:25
Matrix: Solid
Date Received: 04/26/16 10:45
Percent Solids: 95.9

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000053	0.000016	mg/Kg	☼	04/26/16 15:27	04/28/16 14:06	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.00541	U	0.0288	0.0288	1.05	0.180	pCi/g	04/26/16 15:27	04/28/16 14:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*97*		*30 - 110*	*04/26/16 15:27*	*04/28/16 14:06*	*1*

Client Sample ID: L09-02-22-P-S-S-00
Lab Sample ID: 160-17118-8
Date Collected: 04/22/16 10:00
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	**0.892**		0.102	0.136		0.106	pCi/g	04/28/16 09:00	04/29/16 17:50	1

Client Sample ID: L09-02-22-P-S-S-00

Lab Sample ID: 160-17118-8
Date Collected: 04/22/16 10:00
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Americium 241	0.0170	U	0.0546	0.0546		0.0913	pCi/g	04/28/16 09:00	04/29/16 17:50	1
Bismuth 212	**1.27**		0.274	0.304		0.272	pCi/g	04/28/16 09:00	04/29/16 17:50	1
Bismuth 214	**0.688**		0.0810	0.108		0.0604	pCi/g	04/28/16 09:00	04/29/16 17:50	1
Lead 212	**0.886**		0.0753	0.137		0.0652	pCi/g	04/28/16 09:00	04/29/16 17:50	1
Lead 214	**0.846**		0.0720	0.114		0.0626	pCi/g	04/28/16 09:00	04/29/16 17:50	1
Potassium 40	**16.7**		0.979	1.97		0.281	pCi/g	04/28/16 09:00	04/29/16 17:50	1
Protactinium 231	0.689	U	0.298	0.308		0.790	pCi/g	04/28/16 09:00	04/29/16 17:50	1
Radium 226	**0.688**		0.0810	0.108	1.00	0.0604	pCi/g	04/28/16 09:00	04/29/16 17:50	1
Thorium 234	**0.906**		0.246	0.264	1.00	0.690	pCi/g	04/28/16 09:00	04/29/16 17:50	1
Uranium 235	0.119	U	0.109	0.109		0.156	pCi/g	04/28/16 09:00	04/29/16 17:50	1
Protactinium 234m	1.02	U	2.28	2.28		3.97	pCi/g	04/28/16 09:00	04/29/16 17:50	1
Thorium 232	**0.892**		0.102	0.136		0.106	pCi/g	04/28/16 09:00	04/29/16 17:50	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.315*		*0.0386*	*0.0506*		*0.0267*	*pCi/g*	*04/28/16 09:00*	*04/29/16 17:50*	*1*

Client Sample ID: L09-02-22-P-S-S-00

Lab Sample ID: 160-17118-8
Date Collected: 04/22/16 10:00
Matrix: Solid
Date Received: 04/26/16 10:45
Percent Solids: 81.4

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	**0.000020**	**J**	0.000066	0.000020	mg/Kg	☼	04/26/16 15:27	04/28/16 14:23	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	**0.350**		0.0509	0.0603	1.31	0.225	pCi/g	04/26/16 15:27	04/28/16 14:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*94*		*30 - 110*	*04/26/16 15:27*	*04/28/16 14:23*	*1*

Client Sample ID: L09-02-23-P-R-S-00

Lab Sample ID: 160-17118-9
Date Collected: 04/22/16 10:15
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	**1.09**		0.144	0.182		0.152	pCi/g	04/28/16 09:00	04/29/16 17:49	1
Americium 241	0.0528	U	0.0652	0.0655		0.107	pCi/g	04/28/16 09:00	04/29/16 17:49	1
Bismuth 212	**0.846**		0.378	0.388		0.511	pCi/g	04/28/16 09:00	04/29/16 17:49	1
Bismuth 214	**0.809**		0.114	0.142		0.0696	pCi/g	04/28/16 09:00	04/29/16 17:49	1
Lead 212	**1.06**		0.101	0.170		0.0844	pCi/g	04/28/16 09:00	04/29/16 17:49	1
Lead 214	**0.886**		0.101	0.137		0.0961	pCi/g	04/28/16 09:00	04/29/16 17:49	1

Client Sample ID: L09-02-23-P-R-S-00

Lab Sample ID: 160-17118-9
Date Collected: 04/22/16 10:15
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Potassium 40	**18.8**		1.40	2.38		0.262	pCi/g	04/28/16 09:00	04/29/16 17:49	1
Protactinium 231	0.547	U	0.384	0.389		1.13	pCi/g	04/28/16 09:00	04/29/16 17:49	1
Radium 226	**0.809**		0.114	0.142	1.00	0.0696	pCi/g	04/28/16 09:00	04/29/16 17:49	1
Thorium 234	0.859	U	0.314	0.326	1.00	0.908	pCi/g	04/28/16 09:00	04/29/16 17:49	1
Uranium 235	0.172	U	0.165	0.166		0.213	pCi/g	04/28/16 09:00	04/29/16 17:49	1
Protactinium 234m	3.57	U	3.94	3.96		6.39	pCi/g	04/28/16 09:00	04/29/16 17:49	1
Thorium 232	**1.09**		0.144	0.182		0.152	pCi/g	04/28/16 09:00	04/29/16 17:49	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.401*		*0.0570*	*0.0706*		*0.0393*	*pCi/g*	*04/28/16 09:00*	*04/29/16 17:49*	*1*

Client Sample ID: L09-02-23-P-R-S-00

Lab Sample ID: 160-17118-9
Date Collected: 04/22/16 10:15
Matrix: Solid
Date Received: 04/26/16 10:45
Percent Solids: 80.4

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000066	0.000020	mg/Kg	☼	04/26/16 15:27	04/28/16 14:28	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.203	U	0.0935	0.0953	1.32	0.226	pCi/g	04/26/16 15:27	04/28/16 14:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*95*		*30 - 110*	*04/26/16 15:27*	*04/28/16 14:28*	*1*

Client Sample ID: L09-02-24-P-E-S-00

Lab Sample ID: 160-17118-10
Date Collected: 04/22/16 10:20
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	**0.791**		0.173	0.191		0.126	pCi/g	04/28/16 09:00	05/01/16 11:00	1
Americium 241	0.00274	U	0.0669	0.0669		0.113	pCi/g	04/28/16 09:00	05/01/16 11:00	1
Bismuth 212	**1.48**		0.596	0.616		0.522	pCi/g	04/28/16 09:00	05/01/16 11:00	1
Bismuth 214	**0.755**		0.119	0.143		0.0921	pCi/g	04/28/16 09:00	05/01/16 11:00	1
Lead 212	**0.983**		0.0881	0.155		0.0722	pCi/g	04/28/16 09:00	05/01/16 11:00	1
Lead 214	**0.894**		0.114	0.147		0.0868	pCi/g	04/28/16 09:00	05/01/16 11:00	1
Potassium 40	**17.4**		1.35	2.23		0.391	pCi/g	04/28/16 09:00	05/01/16 11:00	1
Protactinium 231	0.0930	U	0.597	0.597		1.03	pCi/g	04/28/16 09:00	05/01/16 11:00	1
Radium 226	**0.755**		0.119	0.143	1.00	0.0921	pCi/g	04/28/16 09:00	05/01/16 11:00	1
Thorium 234	**1.17**		0.542	0.556	1.00	0.858	pCi/g	04/28/16 09:00	05/01/16 11:00	1
Uranium 235	0.0470	U	0.157	0.157		0.277	pCi/g	04/28/16 09:00	05/01/16 11:00	1

Client Sample ID: L09-02-24-P-E-S-00

Lab Sample ID: 160-17118-10
Date Collected: 04/22/16 10:20
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Protactinium 234m	0.717	U	3.68	3.68		6.52	pCi/g	04/28/16 09:00	05/01/16 11:00	1
Thorium 232	**0.791**		0.173	0.191		0.126	pCi/g	04/28/16 09:00	05/01/16 11:00	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.383*		*0.0587*	*0.0709*		*0.0428*	*pCi/g*	*04/28/16 09:00*	*05/01/16 11:00*	*1*

Client Sample ID: L09-02-24-P-E-S-00

Lab Sample ID: 160-17118-10
Date Collected: 04/22/16 10:20
Matrix: Solid
Date Received: 04/26/16 10:45
Percent Solids: 81.2

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000064	0.000019	mg/Kg	☼	04/26/16 15:27	04/28/16 14:32	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.116	U	0.0875	0.0882	1.28	0.219	pCi/g	04/26/16 15:27	04/28/16 14:32	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*96*		*30 - 110*	*04/26/16 15:27*	*04/28/16 14:32*	*1*

Client Sample ID: L09-02-25-P-S-B-00

Lab Sample ID: 160-17118-11
Date Collected: 04/22/16 10:25
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.131	U	0.0601	0.0616		0.136	pCi/g	04/28/16 09:00	05/01/16 11:39	1
Americium 241	0.0118	U	0.0320	0.0320		0.0541	pCi/g	04/28/16 09:00	05/01/16 11:39	1
Bismuth 212	0.245	U	0.204	0.206		0.312	pCi/g	04/28/16 09:00	05/01/16 11:39	1
Bismuth 214	**0.307**		0.0544	0.0631		0.0258	pCi/g	04/28/16 09:00	05/01/16 11:39	1
Lead 212	**0.195**		0.0379	0.0455		0.0374	pCi/g	04/28/16 09:00	05/01/16 11:39	1
Lead 214	**0.321**		0.0489	0.0592		0.0399	pCi/g	04/28/16 09:00	05/01/16 11:39	1
Potassium 40	**7.43**		0.795	1.10		0.294	pCi/g	04/28/16 09:00	05/01/16 11:39	1
Protactinium 231	0.0882	U	0.125	0.126		0.714	pCi/g	04/28/16 09:00	05/01/16 11:39	1
Radium 226	**0.307**		0.0544	0.0631	1.00	0.0258	pCi/g	04/28/16 09:00	05/01/16 11:39	1
Thorium 234	0.502	U	0.220	0.226	1.00	0.547	pCi/g	04/28/16 09:00	05/01/16 11:39	1
Uranium 235	0.0140	U	0.0413	0.0414		0.126	pCi/g	04/28/16 09:00	05/01/16 11:39	1
Protactinium 234m	0.524	U	2.19	2.19		3.95	pCi/g	04/28/16 09:00	05/01/16 11:39	1
Thorium 232	0.131	U	0.0601	0.0616		0.136	pCi/g	04/28/16 09:00	05/01/16 11:39	1

Client Sample ID: L09-02-25-P-S-B-00

Lab Sample ID: 160-17118-11
Date Collected: 04/22/16 10:25
Matrix: Solid
Date Received: 04/26/16 10:45

Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.0949		0.0273	0.0290		0.0213	pCi/g	04/28/16 09:00	05/01/16 11:39	1

Client Sample ID: L09-02-25-P-S-B-00

Lab Sample ID: 160-17118-11
Date Collected: 04/22/16 10:25
Matrix: Solid
Date Received: 04/26/16 10:45
Percent Solids: 90.3

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000054	0.000016	mg/Kg	☼	04/26/16 15:27	04/28/16 14:36	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.116	U	0.0215	0.0240	1.09	0.186	pCi/g	04/26/16 15:27	04/28/16 14:36	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	100		30 - 110	04/26/16 15:27	04/28/16 14:36	1

Client Sample ID: L09-02-26-P-S-B-00

Lab Sample ID: 160-17118-12
Date Collected: 04/22/16 10:30
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	**1.11**		0.113	0.160		0.0823	pCi/g	04/28/16 09:00	05/01/16 11:35	1
Americium 241	0.00637	U	0.0474	0.0474		0.0800	pCi/g	04/28/16 09:00	05/01/16 11:35	1
Bismuth 212	**1.34**		0.389	0.413		0.326	pCi/g	04/28/16 09:00	05/01/16 11:35	1
Bismuth 214	**0.802**		0.0876	0.121		0.0591	pCi/g	04/28/16 09:00	05/01/16 11:35	1
Lead 212	**1.00**		0.0744	0.150		0.0609	pCi/g	04/28/16 09:00	05/01/16 11:35	1
Lead 214	**0.892**		0.0873	0.127		0.0768	pCi/g	04/28/16 09:00	05/01/16 11:35	1
Potassium 40	**17.3**		1.02	2.05		0.287	pCi/g	04/28/16 09:00	05/01/16 11:35	1
Protactinium 231	-0.496	U	0.651	0.653		1.07	pCi/g	04/28/16 09:00	05/01/16 11:35	1
Radium 226	**0.802**		0.0876	0.121	1.00	0.0591	pCi/g	04/28/16 09:00	05/01/16 11:35	1
Thorium 234	**1.28**		0.539	0.555	1.00	0.727	pCi/g	04/28/16 09:00	05/01/16 11:35	1
Uranium 235	0.156	U	0.128	0.128		0.220	pCi/g	04/28/16 09:00	05/01/16 11:35	1
Protactinium 234m	-0.371	U	3010	3010		3.78	pCi/g	04/28/16 09:00	05/01/16 11:35	1
Thorium 232	**1.11**		0.113	0.160		0.0823	pCi/g	04/28/16 09:00	05/01/16 11:35	1

Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.349		0.0408	0.0545		0.0262	pCi/g	04/28/16 09:00	05/01/16 11:35	1

Client Sample ID: L09-02-26-P-S-B-00

Lab Sample ID: 160-17118-12
Date Collected: 04/22/16 10:30
Matrix: Solid
Date Received: 04/26/16 10:45
Percent Solids: 81.5

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000067	0.000020	mg/Kg	☼	04/26/16 15:27	04/28/16 14:41	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.156	U	0.104	0.105	1.34	0.230	pCi/g	04/26/16 15:27	04/28/16 14:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*95*		*30 - 110*	*04/26/16 15:27*	*04/28/16 14:41*	*1*

Client Sample ID: L09-03-25-P-E-B-00

Lab Sample ID: 160-17118-13
Date Collected: 04/14/16 15:00
Matrix: Solid
Date Received: 04/26/16 10:45

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	**1.13**		0.122	0.168		0.134	pCi/g	04/28/16 09:00	05/01/16 11:41	1
Americium 241	-0.00122	U	0.0586	0.0586		0.0991	pCi/g	04/28/16 09:00	05/01/16 11:41	1
Bismuth 212	**1.17**		0.539	0.552		0.538	pCi/g	04/28/16 09:00	05/01/16 11:41	1
Bismuth 214	**0.868**		0.107	0.140		0.0749	pCi/g	04/28/16 09:00	05/01/16 11:41	1
Lead 212	**1.05**		0.0846	0.160		0.0720	pCi/g	04/28/16 09:00	05/01/16 11:41	1
Lead 214	**0.862**		0.0875	0.125		0.0889	pCi/g	04/28/16 09:00	05/01/16 11:41	1
Potassium 40	**18.5**		1.22	2.25		0.233	pCi/g	04/28/16 09:00	05/01/16 11:41	1
Protactinium 231	0.524	U	0.338	0.342		1.13	pCi/g	04/28/16 09:00	05/01/16 11:41	1
Radium 226	**0.868**		0.107	0.140	1.00	0.0749	pCi/g	04/28/16 09:00	05/01/16 11:41	1
Thorium 234	**1.14**		0.529	0.542	1.00	0.837	pCi/g	04/28/16 09:00	05/01/16 11:41	1
Uranium 235	0.0534	U	0.142	0.142		0.238	pCi/g	04/28/16 09:00	05/01/16 11:41	1
Protactinium 234m	1.21	U	2.90	2.90		5.37	pCi/g	04/28/16 09:00	05/01/16 11:41	1
Thorium 232	**1.13**		0.122	0.168		0.134	pCi/g	04/28/16 09:00	05/01/16 11:41	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.330*		*0.0601*	*0.0692*		*0.0482*	*pCi/g*	*04/28/16 09:00*	*05/01/16 11:41*	*1*

Client Sample ID: L09-03-25-P-E-B-00

Lab Sample ID: 160-17118-13
Date Collected: 04/14/16 15:00
Matrix: Solid
Date Received: 04/26/16 10:45
Percent Solids: 79.9

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000064	0.000019	mg/Kg	☼	04/26/16 15:27	04/28/16 14:45	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	**0.276**		0.0747	0.0789	1.28	0.219	pCi/g	04/26/16 15:27	04/28/16 14:45	1

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

TestAmerica Job ID: 160-17118-1

Client Sample ID: L09-03-25-P-E-B-00
Date Collected: 04/14/16 15:00
Date Received: 04/26/16 10:45

Lab Sample ID: 160-17118-13
Matrix: Solid
Percent Solids: 79.9

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	96		30 - 110	04/26/16 15:27	04/28/16 14:45	1

Method: 6020A - Metals (ICP/MS), Tc-99

Lab Sample ID: MB 160-247984/1-A
Matrix: Solid
Analysis Batch: 248493

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 247984

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000050	0.000015	mg/Kg		04/26/16 15:27	04/28/16 13:10	1

Lab Sample ID: LCS 160-247984/2-A
Matrix: Solid
Analysis Batch: 248493

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 247984

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	0.00118	0.00118		mg/Kg		100	80 - 120

Lab Sample ID: 160-17118-1 MS
Matrix: Solid
Analysis Batch: 248493

Client Sample ID: L08-14-18-T-E-B-00
Prep Type: Total/NA
Prep Batch: 247984

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	0.000092		0.00141	0.00154		mg/Kg	☼	102	75 - 125

Lab Sample ID: 160-17118-1 MSD
Matrix: Solid
Analysis Batch: 248493

Client Sample ID: L08-14-18-T-E-B-00
Prep Type: Total/NA
Prep Batch: 247984

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Technetium 99	0.000092		0.00142	0.00158		mg/Kg	☼	105	75 - 125	3	30

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Lab Sample ID: MB 160-247984/1-A
Matrix: Solid
Analysis Batch: 248494

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 247984

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.003420	U	0.0313	0.0313	0.999	0.171	pCi/g	04/26/16 15:27	04/28/16 13:10	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*99*		*30 - 110*	*04/26/16 15:27*	*04/28/16 13:10*	*1*

Lab Sample ID: LCS 160-247984/2-A
Matrix: Solid
Analysis Batch: 248494

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 247984

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	20.2	20.17		2.00	1.01	0.174	pCi/g	100	80 - 120

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Re	*98*		*30 - 110*

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity (Continued)

Lab Sample ID: 160-17118-1 MS
Matrix: Solid
Analysis Batch: 248494

Client Sample ID: L08-14-18-T-E-B-00
Prep Type: Total/NA
Prep Batch: 247984

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	1.57		24.1	26.31		2.54	1.28	0.219	pCi/g	102	75 - 125

Carrier	*MS %Yield*	*MS Qualifier*	*Limits*
Re	*93*		*30 - 110*

Lab Sample ID: 160-17118-1 MSD
Matrix: Solid
Analysis Batch: 248494

Client Sample ID: L08-14-18-T-E-B-00
Prep Type: Total/NA
Prep Batch: 247984

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Technetium 99	1.57		24.3	27.06		2.51	1.25	0.214	pCi/g	105	75 - 125	0.15	1

Carrier	*MSD %Yield*	*MSD Qualifier*	*Limits*
Re	*95*		*30 - 110*

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-248208/1-A
Matrix: Solid
Analysis Batch: 248780

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 248208

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.01676	U	0.0195	0.0196		0.0322	pCi/g	04/28/16 09:00	05/02/16 06:43	1
Americium 241	0.003766	U	0.0125	0.0125		0.0220	pCi/g	04/28/16 09:00	05/02/16 06:43	1
Bismuth 212	-0.03022	U	0.107	0.107		0.193	pCi/g	04/28/16 09:00	05/02/16 06:43	1
Bismuth 214	0.009865	U	0.0173	0.0173		0.0368	pCi/g	04/28/16 09:00	05/02/16 06:43	1
Lead 212	0.01219	U	0.0127	0.0128		0.0197	pCi/g	04/28/16 09:00	05/02/16 06:43	1
Lead 214	-0.001727	U	0.0191	0.0191		0.0297	pCi/g	04/28/16 09:00	05/02/16 06:43	1
Potassium 40	-0.05039	U	1.92	1.92		0.264	pCi/g	04/28/16 09:00	05/02/16 06:43	1
Protactinium 231	-0.02021	U	0.169	0.169		0.310	pCi/g	04/28/16 09:00	05/02/16 06:43	1
Radium 226	0.009865	U	0.0173	0.0173	1.00	0.0368	pCi/g	04/28/16 09:00	05/02/16 06:43	1
Thorium 234	-0.08880	U	0.391	0.391	1.00	0.259	pCi/g	04/28/16 09:00	05/02/16 06:43	1
Uranium 235	-0.007850	U	1.34	1.34		0.0595	pCi/g	04/28/16 09:00	05/02/16 06:43	1
Protactinium 234m	-0.2895	U	11.3	11.3		2.10	pCi/g	04/28/16 09:00	05/02/16 06:43	1
Thorium 232	0.01676	U	0.0195	0.0196		0.0322	pCi/g	04/28/16 09:00	05/02/16 06:43	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*	*04/28/16 09:00*	*05/02/16 06:43*	*1*

Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: LCS 160-248208/2-A
Matrix: Solid
Analysis Batch: 248586

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 248208

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium 241	101	99.32		10.3		0.504	pCi/g	99	87 - 116
Cesium 137	34.0	33.36		3.49	0.200	0.155	pCi/g	98	87 - 120
Cobalt 60	31.4	30.16		3.04		0.113	pCi/g	96	87 - 115

Lab Sample ID: 160-17118-1 DU
Matrix: Solid
Analysis Batch: 248585

Client Sample ID: L08-14-18-T-E-B-00
Prep Type: Total/NA
Prep Batch: 248208

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Actinium 228	1.14		1.020		0.181		0.0584	pCi/g	0.31	1
Americium 241	-0.00451	U	-0.02404	U	0.0582		0.0972	pCi/g	0.15	1
Bismuth 212	1.32		1.483		0.434		0.308	pCi/g	0.20	1
Bismuth 214	0.782		0.7632		0.117		0.0436	pCi/g	0.07	1
Lead 212	0.987		0.9587		0.147		0.0642	pCi/g	0.09	1
Lead 214	0.862		0.7955		0.113		0.0808	pCi/g	0.27	1
Potassium 40	18.5		17.96		2.20		0.236	pCi/g	0.11	1
Protactinium 231	0.458	U	0.0000	U	19.2		1.08	pCi/g	0.02	1
Radium 226	0.782		0.7632		0.117	1.00	0.0436	pCi/g	0.07	1
Thorium 234	2.18		1.443		0.552	1.00	0.721	pCi/g	0.54	1
Uranium 235	0.0593	U	0.1045	U	0.134		0.224	pCi/g	0.18	1
Protactinium 234m	0.642	U	0.5658	U	2.83		5.03	pCi/g	0.01	1
Thorium 232	1.14		1.020		0.181		0.0584	pCi/g	0.31	1

Other Detected Radionuclides	*Sample Result*	*Sample Qual*	*DU Result*	*DU Qual*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*RER*	*RER Limit*
Tl-208	*0.349*		*0.2975*		*0.0561*		*0.0345*	*pCi/g*	*0.42*	*1*

Metals

Prep Batch: 247984

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17118-1	L08-14-18-T-E-B-00	Total/NA	Solid	None	
160-17118-1 MS	L08-14-18-T-E-B-00	Total/NA	Solid	None	
160-17118-1 MSD	L08-14-18-T-E-B-00	Total/NA	Solid	None	
160-17118-2	L08-14-19-T-R-B-00	Total/NA	Solid	None	
160-17118-3	L08-14-20-T-R-B-00	Total/NA	Solid	None	
160-17118-4	L09-01-25-P-S-B-00	Total/NA	Solid	None	
160-17118-5	L09-02-19-P-S-S-00	Total/NA	Solid	None	
160-17118-6	L09-02-20-P-R-S-00	Total/NA	Solid	None	
160-17118-7	L09-02-21-P-E-S-00	Total/NA	Solid	None	
160-17118-8	L09-02-22-P-S-S-00	Total/NA	Solid	None	
160-17118-9	L09-02-23-P-R-S-00	Total/NA	Solid	None	
160-17118-10	L09-02-24-P-E-S-00	Total/NA	Solid	None	
160-17118-11	L09-02-25-P-S-B-00	Total/NA	Solid	None	
160-17118-12	L09-02-26-P-S-B-00	Total/NA	Solid	None	
160-17118-13	L09-03-25-P-E-B-00	Total/NA	Solid	None	
LCS 160-247984/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-247984/1-A	Method Blank	Total/NA	Solid	None	

Analysis Batch: 248493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17118-1	L08-14-18-T-E-B-00	Total/NA	Solid	6020A	247984
160-17118-1 MS	L08-14-18-T-E-B-00	Total/NA	Solid	6020A	247984
160-17118-1 MSD	L08-14-18-T-E-B-00	Total/NA	Solid	6020A	247984
160-17118-2	L08-14-19-T-R-B-00	Total/NA	Solid	6020A	247984
160-17118-3	L08-14-20-T-R-B-00	Total/NA	Solid	6020A	247984
160-17118-4	L09-01-25-P-S-B-00	Total/NA	Solid	6020A	247984
160-17118-5	L09-02-19-P-S-S-00	Total/NA	Solid	6020A	247984
160-17118-6	L09-02-20-P-R-S-00	Total/NA	Solid	6020A	247984
160-17118-7	L09-02-21-P-E-S-00	Total/NA	Solid	6020A	247984
160-17118-8	L09-02-22-P-S-S-00	Total/NA	Solid	6020A	247984
160-17118-9	L09-02-23-P-R-S-00	Total/NA	Solid	6020A	247984
160-17118-10	L09-02-24-P-E-S-00	Total/NA	Solid	6020A	247984
160-17118-11	L09-02-25-P-S-B-00	Total/NA	Solid	6020A	247984
160-17118-12	L09-02-26-P-S-B-00	Total/NA	Solid	6020A	247984
160-17118-13	L09-03-25-P-E-B-00	Total/NA	Solid	6020A	247984
LCS 160-247984/2-A	Lab Control Sample	Total/NA	Solid	6020A	247984
MB 160-247984/1-A	Method Blank	Total/NA	Solid	6020A	247984

General Chemistry

Analysis Batch: 248003

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17118-1	L08-14-18-T-E-B-00	Total/NA	Solid	Moisture	
160-17118-1 DU	L08-14-18-T-E-B-00	Total/NA	Solid	Moisture	
160-17118-2	L08-14-19-T-R-B-00	Total/NA	Solid	Moisture	
160-17118-3	L08-14-20-T-R-B-00	Total/NA	Solid	Moisture	
160-17118-4	L09-01-25-P-S-B-00	Total/NA	Solid	Moisture	
160-17118-5	L09-02-19-P-S-S-00	Total/NA	Solid	Moisture	
160-17118-6	L09-02-20-P-R-S-00	Total/NA	Solid	Moisture	
160-17118-7	L09-02-21-P-E-S-00	Total/NA	Solid	Moisture	

General Chemistry (Continued)

Analysis Batch: 248003 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17118-8	L09-02-22-P-S-S-00	Total/NA	Solid	Moisture	
160-17118-9	L09-02-23-P-R-S-00	Total/NA	Solid	Moisture	
160-17118-10	L09-02-24-P-E-S-00	Total/NA	Solid	Moisture	
160-17118-11	L09-02-25-P-S-B-00	Total/NA	Solid	Moisture	
160-17118-12	L09-02-26-P-S-B-00	Total/NA	Solid	Moisture	
160-17118-13	L09-03-25-P-E-B-00	Total/NA	Solid	Moisture	

Rad

Leach Batch: 247971

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17118-1	L08-14-18-T-E-B-00	Total/NA	Solid	Dry and Grind	
160-17118-1 DU	L08-14-18-T-E-B-00	Total/NA	Solid	Dry and Grind	
160-17118-2	L08-14-19-T-R-B-00	Total/NA	Solid	Dry and Grind	
160-17118-3	L08-14-20-T-R-B-00	Total/NA	Solid	Dry and Grind	
160-17118-4	L09-01-25-P-S-B-00	Total/NA	Solid	Dry and Grind	
160-17118-5	L09-02-19-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17118-6	L09-02-20-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17118-7	L09-02-21-P-E-S-00	Total/NA	Solid	Dry and Grind	
160-17118-8	L09-02-22-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17118-9	L09-02-23-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17118-10	L09-02-24-P-E-S-00	Total/NA	Solid	Dry and Grind	
160-17118-11	L09-02-25-P-S-B-00	Total/NA	Solid	Dry and Grind	
160-17118-12	L09-02-26-P-S-B-00	Total/NA	Solid	Dry and Grind	
160-17118-13	L09-03-25-P-E-B-00	Total/NA	Solid	Dry and Grind	

Prep Batch: 247984

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17118-1	L08-14-18-T-E-B-00	Total/NA	Solid	None	
160-17118-1 MS	L08-14-18-T-E-B-00	Total/NA	Solid	None	
160-17118-1 MSD	L08-14-18-T-E-B-00	Total/NA	Solid	None	
160-17118-2	L08-14-19-T-R-B-00	Total/NA	Solid	None	
160-17118-3	L08-14-20-T-R-B-00	Total/NA	Solid	None	
160-17118-4	L09-01-25-P-S-B-00	Total/NA	Solid	None	
160-17118-5	L09-02-19-P-S-S-00	Total/NA	Solid	None	
160-17118-6	L09-02-20-P-R-S-00	Total/NA	Solid	None	
160-17118-7	L09-02-21-P-E-S-00	Total/NA	Solid	None	
160-17118-8	L09-02-22-P-S-S-00	Total/NA	Solid	None	
160-17118-9	L09-02-23-P-R-S-00	Total/NA	Solid	None	
160-17118-10	L09-02-24-P-E-S-00	Total/NA	Solid	None	
160-17118-11	L09-02-25-P-S-B-00	Total/NA	Solid	None	
160-17118-12	L09-02-26-P-S-B-00	Total/NA	Solid	None	
160-17118-13	L09-03-25-P-E-B-00	Total/NA	Solid	None	
LCS 160-247984/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-247984/1-A	Method Blank	Total/NA	Solid	None	

Prep Batch: 248208

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17118-1	L08-14-18-T-E-B-00	Total/NA	Solid	Fill_Geo-0	247971
160-17118-1 DU	L08-14-18-T-E-B-00	Total/NA	Solid	Fill_Geo-0	247971

Rad (Continued)

Prep Batch: 248208 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17118-2	L08-14-19-T-R-B-00	Total/NA	Solid	Fill_Geo-0	247971
160-17118-3	L08-14-20-T-R-B-00	Total/NA	Solid	Fill_Geo-0	247971
160-17118-4	L09-01-25-P-S-B-00	Total/NA	Solid	Fill_Geo-0	247971
160-17118-5	L09-02-19-P-S-S-00	Total/NA	Solid	Fill_Geo-0	247971
160-17118-6	L09-02-20-P-R-S-00	Total/NA	Solid	Fill_Geo-0	247971
160-17118-7	L09-02-21-P-E-S-00	Total/NA	Solid	Fill_Geo-0	247971
160-17118-8	L09-02-22-P-S-S-00	Total/NA	Solid	Fill_Geo-0	247971
160-17118-9	L09-02-23-P-R-S-00	Total/NA	Solid	Fill_Geo-0	247971
160-17118-10	L09-02-24-P-E-S-00	Total/NA	Solid	Fill_Geo-0	247971
160-17118-11	L09-02-25-P-S-B-00	Total/NA	Solid	Fill_Geo-0	247971
160-17118-12	L09-02-26-P-S-B-00	Total/NA	Solid	Fill_Geo-0	247971
160-17118-13	L09-03-25-P-E-B-00	Total/NA	Solid	Fill_Geo-0	247971
LCS 160-248208/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-0	
MB 160-248208/1-A	Method Blank	Total/NA	Solid	Fill_Geo-0	

Tracer/Carrier Summary

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

TestAmerica Job ID: 160-17118-1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

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

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Re (30-110)
160-17118-1	L08-14-18-T-E-B-00	95
160-17118-1 MS	L08-14-18-T-E-B-00	93
160-17118-1 MSD	L08-14-18-T-E-B-00	95
160-17118-2	L08-14-19-T-R-B-00	95
160-17118-3	L08-14-20-T-R-B-00	96
160-17118-4	L09-01-25-P-S-B-00	90
160-17118-5	L09-02-19-P-S-S-00	99
160-17118-6	L09-02-20-P-R-S-00	99
160-17118-7	L09-02-21-P-E-S-00	97
160-17118-8	L09-02-22-P-S-S-00	94
160-17118-9	L09-02-23-P-R-S-00	95
160-17118-10	L09-02-24-P-E-S-00	96
160-17118-11	L09-02-25-P-S-B-00	100
160-17118-12	L09-02-26-P-S-B-00	95
160-17118-13	L09-03-25-P-E-B-00	96
LCS 160-247984/2-A	Lab Control Sample	98
MB 160-247984/1-A	Method Blank	99

Tracer/Carrier Legend

Re = Re