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: 160-3504-1
Client Project/Site: RFP-CBA-022 (7 DAY TAT)

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

Attn: Martin Swanson

Rhonda Ridenhower

Authorized for release by:
9/10/2013 2:26:58 PM
Rhonda Ridenhower, Customer Service Manager
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Designee for

Ivan Vania, Project Manager I
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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.

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Job ID: 160-3504-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Westinghouse Electric Company LLC

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

Report Number: 160-3504-1

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 08/23/2013; the samples arrived in good condition, properly preserved. The temperature of the coolers at receipt was 18.0 C.

TECHNETIUM-99 (ICPMS)

Samples L050333PUB00 (160-3504-1), L050334PUB00 (160-3504-2), L050335PUB00 (160-3504-3), L050336PUB00 (160-3504-4), L050337PUB00 (160-3504-5), L050338PUB00 (160-3504-6), L050339PUB00 (160-3504-7) and L050340PUB00 (160-3504-8) were analyzed for Technetium-99 (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 08/26/2013 and analyzed on 08/27/2013.

No difficulties were encountered during the Tc-99 analysis.

All quality control parameters were within the acceptance limits.

PERCENT SOLIDS

Job ID: 160-3504-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

Samples L050333PUB00 (160-3504-1), L050334PUB00 (160-3504-2), L050335PUB00 (160-3504-3), L050336PUB00 (160-3504-4), L050337PUB00 (160-3504-5), L050338PUB00 (160-3504-6), L050339PUB00 (160-3504-7) and L050340PUB00 (160-3504-8) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 08/26/2013.

No difficulties were encountered during the % solids analysis.

All quality control parameters were within the acceptance limits.

CESIUM-137 & OTHER GAMMA EMITTERS (GS)

Samples L050333PUB00 (160-3504-1), L050334PUB00 (160-3504-2), L050335PUB00 (160-3504-3), L050336PUB00 (160-3504-4), L050337PUB00 (160-3504-5), L050338PUB00 (160-3504-6), L050339PUB00 (160-3504-7) and L050340PUB00 (160-3504-8) were analyzed for Cesium-137 & Other Gamma Emitters (GS) in accordance with DOE GA-01-R. The samples were dried on 08/26/2013, prepared on 08/28/2013 and analyzed on 08/28/2013 and 08/29/2013.

Radium-226 is reported in these samples at the client's request. Radium-226 is reported from the 609.31 keV line of Bismuth-214. Because the samples have not had a 21-day 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.

Bismuth-214/Radium-226 analyzed by gamma spectroscopy was detected above the MDC but below the CRDL in the method blank. The data is reported. (160-3504-1 DU), (LCS 160-69152/2-A), (MB 160-69152/1-A), L050333PUB00 (160-3504-1), L050334PUB00 (160-3504-2), L050335PUB00 (160-3504-3), L050336PUB00 (160-3504-4), L050337PUB00 (160-3504-5), L050338PUB00 (160-3504-6), L050339PUB00 (160-3504-7), L050340PUB00 (160-3504-8)

The reporting limit for Thorium-234 was not met due to insufficient sample weight available for analysis. Analytical results are reported with the MDC achieved. L050334PUB00 (160-3504-2), L050335PUB00 (160-3504-3), L050338PUB00 (160-3504-6), L050339PUB00 (160-3504-7), L050340PUB00 (160-3504-8)

No other difficulties were encountered during the Gamma spec analysis.

All other quality control parameters were within the acceptance limits.

Hematite Decommissioning Project	Procedure HDP-PR-QA-006, *Chain of Custody*	
	Revision: 3	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-082313-01 **Page** 1/1

Project Name:
Westinghouse Electric Company

Contact Person:
Gerald Rood

Phone Number:
314-810-3382

Sampler Name
Scott Jenkins

Laboratory Name:
TA-MO

Laboratory Address:
13715 Rider Trail North

Phone No.
314-298-8566

Laboratory Contact Person:
Joe Walker

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
L050333PUB00	8/22/2013	11:20	S	C	X		X	X						1	LSA 05-03 Bias
L050334PUB00	8/22/2013	11:25	S	C	X		X	X						1	LSA 05-03 Bias
L050335PUB00	8/22/2013	11:33	S	C	X		X	X						1	LSA 05-03 Bias
L050336PUB00	8/22/2013	11:40	S	C	X		X	X						1	LSA 05-03 Bias
L050337PUB00	8/22/2013	11:45	S	C	X		X	X						1	LSA 05-03 Bias
L050338PUB00	8/23/2013	8:20	S	C	X		X	X						1	LSA 05-03 Bias
L050339PUB00	8/23/2013	8:25	S	C	X		X	X						1	LSA 05-03 Bias
L050340PUB00	8/23/2013	8:30	S	C	X		X	X						1	LSA 05-03 Bias

Relinquished by: [signature]	Date/Time 8-23-13 1605	Received by: Joe Broadhead	Date/Time 8-23 16:10	Total 8	Cooler Temperature: Ambient
Company Name: WEC		Company Name: Crossroads		Cooler ID: 0823-02	Shipper and Number:
Received by:	Date/Time	Relinquished by: Joe Broadhead	Date/Time 8-23 17:40	Comments: Please re-analyze samples after 21-day ingrowth period.	
Company Name:		Company Name: Crossroads			
Relinquished by:	Date/Time	Received by: RM	Date/Time 8-23 17:50	Verified By:	
Company Name:		Company Name: TA			

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Login Sample Receipt Checklist

Client: Westinghouse Electric Company LLC

Job Number: 160-3504-1

Login Number: 3504

List Source: TestAmerica St. Louis

List Number: 1

Creator: Clarke, Jill C

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.	False	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <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

Rad

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

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
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: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3504-1

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: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3504-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-3504-1	L050333PUB00	Solid	08/22/13 11:20	08/23/13 17:50
160-3504-2	L050334PUB00	Solid	08/22/13 11:25	08/23/13 17:50
160-3504-3	L050335PUB00	Solid	08/22/13 11:33	08/23/13 17:50
160-3504-4	L050336PUB00	Solid	08/22/13 11:40	08/23/13 17:50
160-3504-5	L050337PUB00	Solid	08/22/13 11:45	08/23/13 17:50
160-3504-6	L050338PUB00	Solid	08/23/13 08:20	08/23/13 17:50
160-3504-7	L050339PUB00	Solid	08/23/13 08:25	08/23/13 17:50
160-3504-8	L050340PUB00	Solid	08/23/13 08:30	08/23/13 17:50

Client Sample ID: L050333PUB00

Lab Sample ID: 160-3504-1

Date Collected: 08/22/13 11:20
Matrix: Solid
Date Received: 08/23/13 17:50
Percent Solids: 91.9

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00062	0.000019	mg/Kg	☼	08/26/13 10:00	08/27/13 18:40	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	0.112	U	0.0408	0.0480	1.24	0.213	pCi/g	08/26/13 10:00	08/27/13 18:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*88*		*30 - 110*	*08/26/13 10:00*	*08/27/13 18:40*	*1*

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	**0.718**		0.110	0.132		0.0962	pCi/g	08/28/13 15:38	08/29/13 03:03	1
Americium 241	0.00103	U	0.0633	0.0633		0.107	pCi/g	08/28/13 15:38	08/29/13 03:03	1
Bismuth 212	**0.807**		0.408	0.417		0.410	pCi/g	08/28/13 15:38	08/29/13 03:03	1
Bismuth 214	**0.622**		0.0956	0.115		0.0735	pCi/g	08/28/13 15:38	08/29/13 03:03	1
Lead 212	**0.784**		0.0624	0.119		0.0553	pCi/g	08/28/13 15:38	08/29/13 03:03	1
Lead 214	**0.721**		0.0718	0.104		0.0576	pCi/g	08/28/13 15:38	08/29/13 03:03	1
Potassium 40	**16.5**		1.04	1.98		0.228	pCi/g	08/28/13 15:38	08/29/13 03:03	1
Protactinium 231	-0.454	U	0.621	0.623		1.03	pCi/g	08/28/13 15:38	08/29/13 03:03	1
Radium 226	**0.622**		0.0956	0.115	1.00	0.0735	pCi/g	08/28/13 15:38	08/29/13 03:03	1
Thorium 234	**6.17**		0.900	1.11	1.00	0.963	pCi/g	08/28/13 15:38	08/29/13 03:03	1
Uranium 235	**1.01**		0.157	0.188		0.210	pCi/g	08/28/13 15:38	08/29/13 03:03	1
Protactinium 234m	**6.13**		3.24	3.30		4.08	pCi/g	08/28/13 15:38	08/29/13 03:03	1
Thorium 232	**0.718**		0.110	0.132		0.0962	pCi/g	08/28/13 15:38	08/29/13 03:03	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.236*		*0.0356*	*0.0432*		*0.0266*	*pCi/g*	*08/28/13 15:38*	*08/29/13 03:03*	*1*

Client Sample ID: L050334PUB00

Lab Sample ID: 160-3504-2

Date Collected: 08/22/13 11:25
Matrix: Solid
Date Received: 08/23/13 17:50
Percent Solids: 89.2

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00066	0.000020	mg/Kg	☼	08/26/13 10:00	08/27/13 18:51	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	-0.0178	U	-0.0409	0.0477	1.31	0.225	pCi/g	08/26/13 10:00	08/27/13 18:51	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*86*		*30 - 110*	*08/26/13 10:00*	*08/27/13 18:51*	*1*

Client Sample ID: L050334PUB00

Date Collected: 08/22/13 11:25
Date Received: 08/23/13 17:50

Lab Sample ID: 160-3504-2

Matrix: Solid

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	**1.04**		0.112	0.154		0.0822	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Americium 241	0.0570	U	0.0991	0.0992		0.164	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Bismuth 212	**1.49**		0.356	0.388		0.301	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Bismuth 214	**0.757**		0.0902	0.120		0.0640	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Lead 212	**1.04**		0.0750	0.154		0.0678	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Lead 214	**0.945**		0.0998	0.140		0.0754	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Potassium 40	**21.4**		1.22	2.51		0.353	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Protactinium 231	0.611	U	0.296	0.304		1.23	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Radium 226	**0.757**		0.0902	0.120	1.00	0.0640	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Thorium 234	**23.4**		1.45	2.84	1.00	1.43	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Uranium 235	**4.66**		0.311	0.567		0.308	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Protactinium 234m	**30.4**		5.40	6.21		3.55	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Thorium 232	**1.04**		0.112	0.154		0.0822	pCi/g	08/28/13 15:38	08/28/13 22:43	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.362*		*0.0532*	*0.0651*		*0.0404*	*pCi/g*	*08/28/13 15:38*	*08/28/13 22:43*	*1*

Client Sample ID: L050335PUB00

Date Collected: 08/22/13 11:33
Date Received: 08/23/13 17:50

Lab Sample ID: 160-3504-3

Matrix: Solid
Percent Solids: 85.3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00069	0.000021	mg/Kg	☼	08/26/13 10:00	08/27/13 18:55	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	-0.0494	U	-0.00703	0.00982	1.38	0.236	pCi/g	08/26/13 10:00	08/27/13 18:55	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*85*		*30 - 110*	*08/26/13 10:00*	*08/27/13 18:55*	*1*

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**		0.128	0.165		0.119	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Americium 241	-0.0326	U	0.0840	0.0841		0.140	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Bismuth 212	**1.29**		0.365	0.389		0.317	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Bismuth 214	**0.797**		0.113	0.140		0.0821	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Lead 212	**0.917**		0.0786	0.142		0.0861	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Lead 214	**0.909**		0.0826	0.125		0.0630	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Potassium 40	**21.6**		1.26	2.55		0.389	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Protactinium 231	**0.886**		0.370	0.383		0.725	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Radium 226	**0.797**		0.113	0.140	1.00	0.0821	pCi/g	08/28/13 15:38	08/28/13 22:42	1

Client Sample ID: L050335PUB00

Lab Sample ID: 160-3504-3

Date Collected: 08/22/13 11:33

Matrix: Solid

Date Received: 08/23/13 17:50

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
Thorium 234	**6.43**		1.09	1.28	1.00	1.15	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Uranium 235	**1.05**		0.186	0.214		0.253	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Protactinium 234m	**6.75**		3.50	3.57		5.10	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Thorium 232	**1.03**		0.128	0.165		0.119	pCi/g	08/28/13 15:38	08/28/13 22:42	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.393*		*0.0514*	*0.0656*		*0.0380*	*pCi/g*	*08/28/13 15:38*	*08/28/13 22:42*	*1*

Client Sample ID: L050336PUB00

Lab Sample ID: 160-3504-4

Date Collected: 08/22/13 11:40

Matrix: Solid

Date Received: 08/23/13 17:50

Percent Solids: 85.6

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00068	0.000020	mg/Kg	☼	08/26/13 10:00	08/27/13 18:59	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	-0.0334	U	-0.0817	0.0947	1.35	0.232	pCi/g	08/26/13 10:00	08/27/13 18:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*86*		*30 - 110*	*08/26/13 10:00*	*08/27/13 18:59*	*1*

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	**1.23**		0.142	0.189		0.132	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Americium 241	0.0114	U	0.0626	0.0626		0.106	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Bismuth 212	**1.32**		0.404	0.427		0.347	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Bismuth 214	**0.874**		0.124	0.154		0.0918	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Lead 212	**1.18**		0.0855	0.175		0.0653	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Lead 214	**0.901**		0.0904	0.130		0.0849	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Potassium 40	**19.1**		1.38	2.39		0.333	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Protactinium 231	0.500	U	0.262	0.267		1.36	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Radium 226	**0.874**		0.124	0.154	1.00	0.0918	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Thorium 234	**3.35**		0.795	0.868	1.00	0.981	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Uranium 235	**0.341**		0.176	0.179		0.236	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Protactinium 234m	1.95	U	3.64	3.65		5.85	pCi/g	08/28/13 15:38	08/28/13 22:43	1
Thorium 232	**1.23**		0.142	0.189		0.132	pCi/g	08/28/13 15:38	08/28/13 22:43	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.392*		*0.0637*	*0.0756*		*0.0475*	*pCi/g*	*08/28/13 15:38*	*08/28/13 22:43*	*1*

Client Sample ID: L050337PUB00

Lab Sample ID: 160-3504-5
Date Collected: 08/22/13 11:45
Matrix: Solid
Date Received: 08/23/13 17:50
Percent Solids: 84.8

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00068	0.000020	mg/Kg	☼	08/26/13 10:00	08/27/13 19:03	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	-0.0562	U	-0.0424	0.0492	1.36	0.233	pCi/g	08/26/13 10:00	08/27/13 19:03	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*87*		*30 - 110*	*08/26/13 10:00*	*08/27/13 19:03*	*1*

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	**1.27**		0.149	0.198		0.116	pCi/g	08/28/13 15:38	08/28/13 22:44	1
Americium 241	-0.0141	U	0.0566	0.0567		0.0957	pCi/g	08/28/13 15:38	08/28/13 22:44	1
Bismuth 212	0.470	U	0.389	0.392		0.608	pCi/g	08/28/13 15:38	08/28/13 22:44	1
Bismuth 214	**0.810**		0.112	0.140		0.0790	pCi/g	08/28/13 15:38	08/28/13 22:44	1
Lead 212	**1.04**		0.0885	0.162		0.0783	pCi/g	08/28/13 15:38	08/28/13 22:44	1
Lead 214	**0.966**		0.111	0.150		0.106	pCi/g	08/28/13 15:38	08/28/13 22:44	1
Potassium 40	**20.0**		1.48	2.52		0.202	pCi/g	08/28/13 15:38	08/28/13 22:44	1
Protactinium 231	0.421	U	0.222	0.227		1.42	pCi/g	08/28/13 15:38	08/28/13 22:44	1
Radium 226	**0.810**		0.112	0.140	1.00	0.0790	pCi/g	08/28/13 15:38	08/28/13 22:44	1
Thorium 234	**3.49**		0.765	0.847	1.00	0.949	pCi/g	08/28/13 15:38	08/28/13 22:44	1
Uranium 235	**0.436**		0.177	0.183		0.217	pCi/g	08/28/13 15:38	08/28/13 22:44	1
Protactinium 234m	-2.99	U	4.78	4.79		8.02	pCi/g	08/28/13 15:38	08/28/13 22:44	1
Thorium 232	**1.27**		0.149	0.198		0.116	pCi/g	08/28/13 15:38	08/28/13 22:44	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.404*		*0.0620*	*0.0748*		*0.0441*	*pCi/g*	*08/28/13 15:38*	*08/28/13 22:44*	*1*

Client Sample ID: L050338PUB00

Lab Sample ID: 160-3504-6
Date Collected: 08/23/13 08:20
Matrix: Solid
Date Received: 08/23/13 17:50
Percent Solids: 81.6

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00073	0.000022	mg/Kg	☼	08/26/13 10:00	08/27/13 19:15	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	0.0110	U	0.0628	0.0743	1.46	0.250	pCi/g	08/26/13 10:00	08/27/13 19:15	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*85*		*30 - 110*	*08/26/13 10:00*	*08/27/13 19:15*	*1*

Client Sample ID: L050338PUB00

Lab Sample ID: 160-3504-6

Date Collected: 08/23/13 08:20

Matrix: Solid

Date Received: 08/23/13 17:50

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	**1.04**		0.169	0.199		0.118	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Americium 241	-0.0130	U	0.0831	0.0831		0.139	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Bismuth 212	**1.58**		0.480	0.508		0.423	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Bismuth 214	**0.756**		0.101	0.128		0.0739	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Lead 212	**1.15**		0.0794	0.169		0.0658	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Lead 214	**0.921**		0.0827	0.127		0.0706	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Potassium 40	**20.1**		1.25	2.40		0.355	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Protactinium 231	0.396	U	0.204	0.209		1.23	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Radium 226	**0.756**		0.101	0.128	1.00	0.0739	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Thorium 234	**10.0**		1.07	1.50	1.00	1.16	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Uranium 235	**1.79**		0.224	0.289		0.234	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Protactinium 234m	**12.6**		4.32	4.50		5.09	pCi/g	08/28/13 15:38	08/28/13 22:42	1
Thorium 232	**1.04**		0.169	0.199		0.118	pCi/g	08/28/13 15:38	08/28/13 22:42	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.361*		*0.0483*	*0.0612*		*0.0362*	*pCi/g*	*08/28/13 15:38*	*08/28/13 22:42*	*1*

Client Sample ID: L050339PUB00

Lab Sample ID: 160-3504-7

Date Collected: 08/23/13 08:25

Matrix: Solid

Date Received: 08/23/13 17:50

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		0.00070	0.000021	mg/Kg	☼	08/26/13 10:00	08/27/13 19:19	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	-0.0188	U	-0.0547	0.0625	1.41	0.241	pCi/g	08/26/13 10:00	08/27/13 19:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*88*		*30 - 110*	*08/26/13 10:00*	*08/27/13 19:19*	*1*

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**		0.141	0.178		0.152	pCi/g	08/28/13 15:38	08/28/13 22:03	1
Americium 241	-0.0365	U	91.0	91.0		0.152	pCi/g	08/28/13 15:38	08/28/13 22:03	1
Bismuth 212	**1.25**		0.431	0.448		0.394	pCi/g	08/28/13 15:38	08/28/13 22:03	1
Bismuth 214	**0.764**		0.0975	0.123		0.0697	pCi/g	08/28/13 15:38	08/28/13 22:03	1
Lead 212	**1.16**		0.0854	0.152		0.0743	pCi/g	08/28/13 15:38	08/28/13 22:03	1
Lead 214	**0.948**		0.112	0.145		0.0907	pCi/g	08/28/13 15:38	08/28/13 22:03	1
Potassium 40	**23.1**		1.43	2.65		0.380	pCi/g	08/28/13 15:38	08/28/13 22:03	1
Protactinium 231	0.484	U	0.247	0.252		1.46	pCi/g	08/28/13 15:38	08/28/13 22:03	1
Radium 226	**0.764**		0.0975	0.123	1.00	0.0697	pCi/g	08/28/13 15:38	08/28/13 22:03	1

Client Sample ID: L050339PUB00

Lab Sample ID: 160-3504-7

Date Collected: 08/23/13 08:25

Matrix: Solid

Date Received: 08/23/13 17:50

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
Thorium 234	11.5		1.44	1.83	1.00	1.44	pCi/g	08/28/13 15:38	08/28/13 22:03	1
Uranium 235	2.49		0.244	0.343		0.313	pCi/g	08/28/13 15:38	08/28/13 22:03	1
Protactinium 234m	20.3		5.80	6.12		4.27	pCi/g	08/28/13 15:38	08/28/13 22:03	1
Thorium 232	1.13		0.141	0.178		0.152	pCi/g	08/28/13 15:38	08/28/13 22:03	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.403*		*0.0568*	*0.0690*		*0.0396*	*pCi/g*	*08/28/13 15:38*	*08/28/13 22:03*	*1*

Client Sample ID: L050340PUB00

Lab Sample ID: 160-3504-8

Date Collected: 08/23/13 08:30

Matrix: Solid

Date Received: 08/23/13 17:50

Percent Solids: 81.6

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00067	0.000020	mg/Kg	☼	08/26/13 10:00	08/27/13 19:22	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	-0.0516	U	-0.0204	0.0229	1.34	0.229	pCi/g	08/26/13 10:00	08/27/13 19:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*92*		*30 - 110*	*08/26/13 10:00*	*08/27/13 19:22*	*1*

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	1.08		0.162	0.196		0.175	pCi/g	08/28/13 15:38	08/28/13 23:19	1
Americium 241	-0.0436	U	0.112	0.112		0.186	pCi/g	08/28/13 15:38	08/28/13 23:19	1
Bismuth 212	1.21		0.465	0.481		0.589	pCi/g	08/28/13 15:38	08/28/13 23:19	1
Bismuth 214	0.947		0.125	0.159		0.0646	pCi/g	08/28/13 15:38	08/28/13 23:19	1
Lead 212	1.13		0.0947	0.174		0.0776	pCi/g	08/28/13 15:38	08/28/13 23:19	1
Lead 214	0.990		0.110	0.151		0.105	pCi/g	08/28/13 15:38	08/28/13 23:19	1
Potassium 40	20.5		1.70	2.70		0.587	pCi/g	08/28/13 15:38	08/28/13 23:19	1
Protactinium 231	0.668	U	0.337	0.344		1.72	pCi/g	08/28/13 15:38	08/28/13 23:19	1
Radium 226	0.947		0.125	0.159	1.00	0.0646	pCi/g	08/28/13 15:38	08/28/13 23:19	1
Thorium 234	12.7		1.64	2.11	1.00	1.70	pCi/g	08/28/13 15:38	08/28/13 23:19	1
Uranium 235	2.61		0.307	0.406		0.309	pCi/g	08/28/13 15:38	08/28/13 23:19	1
Protactinium 234m	14.6		5.55	5.74		4.98	pCi/g	08/28/13 15:38	08/28/13 23:19	1
Thorium 232	1.08		0.162	0.196		0.175	pCi/g	08/28/13 15:38	08/28/13 23:19	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.416*		*0.0673*	*0.0800*		*0.0438*	*pCi/g*	*08/28/13 15:38*	*08/28/13 23:19*	*1*

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

Lab Sample ID: MB 160-68468/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 68965 — **Prep Batch: 68468**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00053	0.000016	mg/Kg		08/26/13 10:00	08/27/13 18:32	1

Lab Sample ID: LCS 160-68468/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 68965 — **Prep Batch: 68468**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	0.00253	0.00250		mg/Kg		99	80 - 120

Lab Sample ID: 160-3504-1 MS — **Client Sample ID: L050333PUB00**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 68965 — **Prep Batch: 68468**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	ND		0.00282	0.00267		mg/Kg	☼	94	75 - 125

Lab Sample ID: 160-3504-1 MSD — **Client Sample ID: L050333PUB00**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 68965 — **Prep Batch: 68468**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Technetium 99	ND		0.00295	0.00269		mg/Kg	☼	91	75 - 125	1	30

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

Lab Sample ID: MB 160-68468/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 68966 — **Prep Batch: 68468**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	-0.03681	U	-0.0322	0.0347	1.07	0.183	pCi/g	08/26/13 10:00	08/27/13 18:32	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*93*		*30 - 110*	*08/26/13 10:00*	*08/27/13 18:32*	*1*

Lab Sample ID: LCS 160-68468/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 68966 — **Prep Batch: 68468**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	43.3	42.88		4.38	1.08	0.185	pCi/g	99	80 - 120

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Re	*92*		*30 - 110*

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

Lab Sample ID: 160-3504-1 MS — **Client Sample ID: L050333PUB00**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 68966 — **Prep Batch: 68468**

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	0.112	U	48.3	45.63		4.92	1.21	0.207	pCi/g	94	75 - 125

Carrier	*MS %Yield*	*MS Qualifier*	*Limits*
Re	*90*		*30 - 110*

Lab Sample ID: 160-3504-1 MSD — **Client Sample ID: L050333PUB00**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 68966 — **Prep Batch: 68468**

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	0.112	U	50.4	46.03		4.99	1.26	0.216	pCi/g	91	75 - 125	0.04	1

Carrier	*MSD %Yield*	*MSD Qualifier*	*Limits*
Re	*86*		*30 - 110*

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

Lab Sample ID: MB 160-69152/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 69120 — **Prep Batch: 69152**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.008818	U	0.0268	0.0268		0.0379	pCi/g	08/28/13 15:38	08/28/13 22:04	1
Americium 241	0.0000	U	0.00898	0.00898		0.0353	pCi/g	08/28/13 15:38	08/28/13 22:04	1
Bismuth 212	0.03646	U	0.127	0.127		0.237	pCi/g	08/28/13 15:38	08/28/13 22:04	1
Bismuth 214	0.08036		0.0461	0.0469		0.0484	pCi/g	08/28/13 15:38	08/28/13 22:04	1
Lead 212	-0.002784	U	0.0271	0.0271		0.0297	pCi/g	08/28/13 15:38	08/28/13 22:04	1
Lead 214	0.02607	U	0.0230	0.0232		0.0443	pCi/g	08/28/13 15:38	08/28/13 22:04	1
Potassium 40	0.0000	U	0.0430	0.0430		0.471	pCi/g	08/28/13 15:38	08/28/13 22:04	1
Protactinium 231	0.03679	U	0.173	0.173		0.379	pCi/g	08/28/13 15:38	08/28/13 22:04	1
Radium 226	0.08036		0.0461	0.0469	1.00	0.0484	pCi/g	08/28/13 15:38	08/28/13 22:04	1
Thorium 234	0.08769	U	0.164	0.164	1.00	0.307	pCi/g	08/28/13 15:38	08/28/13 22:04	1
Uranium 235	0.01639	U	0.0438	0.0439		0.0767	pCi/g	08/28/13 15:38	08/28/13 22:04	1
Protactinium 234m	0.1185	U	1.04	1.04		1.43	pCi/g	08/28/13 15:38	08/28/13 22:04	1
Thorium 232	0.008818	U	0.0268	0.0268		0.0379	pCi/g	08/28/13 15:38	08/28/13 22:04	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*	*08/28/13 15:38*	*08/28/13 22:04*	*1*

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

TestAmerica Job ID: 160-3504-1

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

Lab Sample ID: LCS 160-69152/2-A
Matrix: Solid
Analysis Batch: 69121

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 69152

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Americium 241			97.7	89.28		9.29		0.429	pCi/g	91	87 - 116		
Cesium 137			31.7	29.69		3.11	0.200	0.128	pCi/g	94	87 - 120		
Cobalt 60			24.8	22.58		2.28		0.0771	pCi/g	91	87 - 115		

Lab Sample ID: 160-3504-1 DU
Matrix: Solid
Analysis Batch: 69117

Client Sample ID: L050333PUB00
Prep Type: Total/NA
Prep Batch: 69152

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Actinium 228	0.718			0.5614		0.124		0.105	pCi/g			0.61	1
Americium 241	0.00103	U		0.02207	U	0.0684		0.114	pCi/g			0.16	1
Bismuth 212	0.807			1.070		0.429		0.356	pCi/g			0.31	1
Bismuth 214	0.622			0.6551		0.110		0.0612	pCi/g			0.15	1
Lead 212	0.784			0.8112		0.122		0.0532	pCi/g			0.11	1
Lead 214	0.721			0.7528		0.104		0.0584	pCi/g			0.15	1
Potassium 40	16.5			16.51		1.98		0.284	pCi/g			0	1
Protactinium 231	-0.454	U		0.09418	U	0.440		0.759	pCi/g			0.52	1
Radium 226	0.622			0.6551		0.110	1.00	0.0612	pCi/g			0.15	1
Thorium 234	6.17			6.104		1.09	1.00	0.938	pCi/g			0.03	1
Uranium 235	1.01			0.9641		0.200		0.196	pCi/g			0.12	1
Protactinium 234m	6.13			5.977		3.15		4.46	pCi/g			0.02	1
Thorium 232	0.718			0.5614		0.124		0.105	pCi/g			0.61	1

Metals

Prep Batch: 68468

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3504-1	L050333PUB00	Total/NA	Solid	None	
160-3504-1 MS	L050333PUB00	Total/NA	Solid	None	
160-3504-1 MSD	L050333PUB00	Total/NA	Solid	None	
160-3504-2	L050334PUB00	Total/NA	Solid	None	
160-3504-3	L050335PUB00	Total/NA	Solid	None	
160-3504-4	L050336PUB00	Total/NA	Solid	None	
160-3504-5	L050337PUB00	Total/NA	Solid	None	
160-3504-6	L050338PUB00	Total/NA	Solid	None	
160-3504-7	L050339PUB00	Total/NA	Solid	None	
160-3504-8	L050340PUB00	Total/NA	Solid	None	
LCS 160-68468/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-68468/1-A	Method Blank	Total/NA	Solid	None	

Analysis Batch: 68965

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3504-1	L050333PUB00	Total/NA	Solid	6020A	68468
160-3504-1 MS	L050333PUB00	Total/NA	Solid	6020A	68468
160-3504-1 MSD	L050333PUB00	Total/NA	Solid	6020A	68468
160-3504-2	L050334PUB00	Total/NA	Solid	6020A	68468
160-3504-3	L050335PUB00	Total/NA	Solid	6020A	68468
160-3504-4	L050336PUB00	Total/NA	Solid	6020A	68468
160-3504-5	L050337PUB00	Total/NA	Solid	6020A	68468
160-3504-6	L050338PUB00	Total/NA	Solid	6020A	68468
160-3504-7	L050339PUB00	Total/NA	Solid	6020A	68468
160-3504-8	L050340PUB00	Total/NA	Solid	6020A	68468
LCS 160-68468/2-A	Lab Control Sample	Total/NA	Solid	6020A	68468
MB 160-68468/1-A	Method Blank	Total/NA	Solid	6020A	68468

General Chemistry

Analysis Batch: 68432

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3504-1	L050333PUB00	Total/NA	Solid	Moisture	
160-3504-2	L050334PUB00	Total/NA	Solid	Moisture	
160-3504-3	L050335PUB00	Total/NA	Solid	Moisture	
160-3504-4	L050336PUB00	Total/NA	Solid	Moisture	
160-3504-5	L050337PUB00	Total/NA	Solid	Moisture	
160-3504-6	L050338PUB00	Total/NA	Solid	Moisture	
160-3504-7	L050339PUB00	Total/NA	Solid	Moisture	
160-3504-8	L050340PUB00	Total/NA	Solid	Moisture	
160-3504-8 DU	L050340PUB00	Total/NA	Solid	Moisture	

Rad

Leach Batch: 68464

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3504-1	L050333PUB00	Total/NA	Solid	Dry and Grind	
160-3504-1 DU	L050333PUB00	Total/NA	Solid	Dry and Grind	
160-3504-2	L050334PUB00	Total/NA	Solid	Dry and Grind	
160-3504-3	L050335PUB00	Total/NA	Solid	Dry and Grind	

Rad (Continued)

Leach Batch: 68464 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3504-4	L050336PUB00	Total/NA	Solid	Dry and Grind	
160-3504-5	L050337PUB00	Total/NA	Solid	Dry and Grind	
160-3504-6	L050338PUB00	Total/NA	Solid	Dry and Grind	
160-3504-7	L050339PUB00	Total/NA	Solid	Dry and Grind	
160-3504-8	L050340PUB00	Total/NA	Solid	Dry and Grind	

Prep Batch: 68468

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3504-1	L050333PUB00	Total/NA	Solid	None	
160-3504-1 MS	L050333PUB00	Total/NA	Solid	None	
160-3504-1 MSD	L050333PUB00	Total/NA	Solid	None	
160-3504-2	L050334PUB00	Total/NA	Solid	None	
160-3504-3	L050335PUB00	Total/NA	Solid	None	
160-3504-4	L050336PUB00	Total/NA	Solid	None	
160-3504-5	L050337PUB00	Total/NA	Solid	None	
160-3504-6	L050338PUB00	Total/NA	Solid	None	
160-3504-7	L050339PUB00	Total/NA	Solid	None	
160-3504-8	L050340PUB00	Total/NA	Solid	None	
LCS 160-68468/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-68468/1-A	Method Blank	Total/NA	Solid	None	

Prep Batch: 69152

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3504-1	L050333PUB00	Total/NA	Solid	Fill_Geo-0	68464
160-3504-1 DU	L050333PUB00	Total/NA	Solid	Fill_Geo-0	68464
160-3504-2	L050334PUB00	Total/NA	Solid	Fill_Geo-0	68464
160-3504-3	L050335PUB00	Total/NA	Solid	Fill_Geo-0	68464
160-3504-4	L050336PUB00	Total/NA	Solid	Fill_Geo-0	68464
160-3504-5	L050337PUB00	Total/NA	Solid	Fill_Geo-0	68464
160-3504-6	L050338PUB00	Total/NA	Solid	Fill_Geo-0	68464
160-3504-7	L050339PUB00	Total/NA	Solid	Fill_Geo-0	68464
160-3504-8	L050340PUB00	Total/NA	Solid	Fill_Geo-0	68464
LCS 160-69152/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-0	
MB 160-69152/1-A	Method Blank	Total/NA	Solid	Fill_Geo-0	

Tracer/Carrier Summary

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

TestAmerica Job ID: 160-3504-1

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

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

		Percent Yield (Acceptance Limits)							
		Re							
Lab Sample ID	Client Sample ID	(30-110)							
160-3504-1	L050333PUB00	88							
160-3504-1 MS	L050333PUB00	90							
160-3504-1 MSD	L050333PUB00	86							
160-3504-2	L050334PUB00	86							
160-3504-3	L050335PUB00	85							
160-3504-4	L050336PUB00	86							
160-3504-5	L050337PUB00	87							
160-3504-6	L050338PUB00	85							
160-3504-7	L050339PUB00	88							
160-3504-8	L050340PUB00	92							
LCS 160-68468/2-A	Lab Control Sample	92							
MB 160-68468/1-A	Method Blank	93							

Tracer/Carrier Legend

Re = Re