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: 160-3570-1
Client Project/Site: RFP-CBA-022 (7 DAY TAT)

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

Attn: Martin Swanson

Authorized for release by:
9/8/2013 9:55:09 AM

Ivan Vania, Project Manager I
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Job ID: 160-3570-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Westinghouse Electric Company LLC

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

Report Number: 160-3570-1

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 08/29/2013; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 20.0 C.

TECHNETIUM-99 (ICPMS)

Samples L050101TUB00 (160-3570-1), L050105TUB00 (160-3570-2), L050107TUB00 (160-3570-3), L050109TUB00 (160-3570-4), L050111TUB00 (160-3570-5), L050113TUB00 (160-3570-6), L050115TUB00 (160-3570-7) and L050117TUB00 (160-3570-8) were analyzed for Technetium-99 (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 08/30/2013 and 09/04/2013 and analyzed on 09/03/2013 and 09/04/2013.

Preparation Batch 69983, Analytical Batches 70530 & 70531:
The following sample(s) was diluted to bring the concentration of target analytes within the calibration range: L050107TUB00 (160-3570-3). Elevated reporting limits (RLs) are provided.

The following sample(s) was diluted due to matrix interference indicated by internal standard failure in the undiluted sample:

Job ID: 160-3570-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

L050109TUB00 (160-3570-4). Elevated reporting limits (RLs) are provided.

Preparation Batch 70525:
The associated sample was re-extracted due to a tracer miss-spike in the original batch L050113TUB00 (160-3570-6).

No difficulties were encountered during the Tc-99 analysis. All quality control parameters were within the acceptance limits.

PERCENT SOLIDS

Samples L050101TUB00 (160-3570-1), L050105TUB00 (160-3570-2), L050107TUB00 (160-3570-3), L050109TUB00 (160-3570-4), L050111TUB00 (160-3570-5), L050113TUB00 (160-3570-6), L050115TUB00 (160-3570-7) and L050117TUB00 (160-3570-8) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 09/03/2013.

No difficulties were encountered during the % solids analysis. All quality control parameters were within the acceptance limits.

CESIUM-137 & OTHER GAMMA EMITTERS (GS)

Samples L050101TUB00 (160-3570-1), L050105TUB00 (160-3570-2), L050107TUB00 (160-3570-3), L050109TUB00 (160-3570-4), L050111TUB00 (160-3570-5), L050113TUB00 (160-3570-6), L050115TUB00 (160-3570-7) and L050117TUB00 (160-3570-8) were analyzed for Cesium-137 & Other Gamma Emitters (GS) in accordance with DOE GA-01-R. The samples were leached on 08/30/2013, and prepared and analyzed on 09/04/2013.

Preparation Batch 70600:
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. (160-3570-8 DU), (LCS 160-70600/2-A), (MB 160-70600/1-A), L050101TUB00 (160-3570-1), L050105TUB00 (160-3570-2), L050107TUB00 (160-3570-3), L050109TUB00 (160-3570-4), L050111TUB00 (160-3570-5), L050113TUB00 (160-3570-6), L050115TUB00 (160-3570-7), L050117TUB00 (160-3570-8)

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. L050101TUB00 (160-3570-1)

No other difficulties were encountered during the Gamma spec analysis. All other quality control parameters were within the acceptance limits.

3570

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-082913-01 **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
L050101TUB00	8/23/2013	14:45	S	C	X		X	X						1	
L050105TUB00	8/23/2013	13:40	S	C	X		X	X						1	
L050107TUB00	8/23/2013	14:15	S	C	X		X	X						1	
L050109TUB00	8/23/2013	13:05	S	C	X		X	X						1	
L050111TUB00	8/22/2013	15:40	S	C	X		X	X						1	
L050113TUB00	8/22/2013	15:20	S	C	X		X	X						1	
L050115TUB00	8/22/2013	15:02	S	C	X		X	X						1	
L050117TUB00	8/22/2013	14:20	S	C	X		X	X						1	

Relinquished by:	Date/Time: 8/28/13 1600	Received by: Joe Bradshaw	Date/Time 8-29-13 16:	Total 8	Cooler Temperature: Ambient
Company Name: WEC		Company Name: Crossroads		Cooler ID: 0829-04	Shipper and Number:
Received by:	Date/Time	Relinquished by: Joe Bradshaw	Date/Time 8-29 18:30	Comments: Please re-analyze samples after 21 day ingrowth period.	
Company Name:		Company Name: Crossroads			
Relinquished by:	Date/Time	Received by:	Date/Time 8-29-13 18:38	Verified By:	
Company Name:		Company Name: TestAmerica			

COPY

Login Sample Receipt Checklist

Client: Westinghouse Electric Company LLC

Job Number: 160-3570-1

Login Number: 3570

List Source: TestAmerica St. Louis

List Number: 1

Creator: Daniels, Brian J

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

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	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: 160-3570-1

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: 160-3570-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-3570-1	L050101TUB00	Solid	08/23/13 14:45	08/29/13 18:38
160-3570-2	L050105TUB00	Solid	08/23/13 13:40	08/29/13 18:38
160-3570-3	L050107TUB00	Solid	08/23/13 14:15	08/29/13 18:38
160-3570-4	L050109TUB00	Solid	08/23/13 13:05	08/29/13 18:38
160-3570-5	L050111TUB00	Solid	08/22/13 15:40	08/29/13 18:38
160-3570-6	L050113TUB00	Solid	08/22/13 15:20	08/29/13 18:38
160-3570-7	L050115TUB00	Solid	08/22/13 15:02	08/29/13 18:38
160-3570-8	L050117TUB00	Solid	08/22/13 14:20	08/29/13 18:38

Client Sample ID: L050101TUB00

Date Collected: 08/23/13 14:45
Date Received: 08/29/13 18:38

Lab Sample ID: 160-3570-1

Matrix: Solid
Percent Solids: 97.9

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	**0.0030**		0.00053	0.000016	mg/Kg	☼	08/30/13 10:44	09/03/13 20:16	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	**51.8**		1.64	5.24	1.05	0.181	pCi/g	08/30/13 10:44	09/03/13 20:16	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*96*		*30 - 110*	*08/30/13 10:44*	*09/03/13 20:16*	*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	0.126	U	0.163	0.163		0.310	pCi/g	09/04/13 13:12	09/04/13 19:11	1
Americium 241	0.00783	U	0.0862	0.0862		0.149	pCi/g	09/04/13 13:12	09/04/13 19:11	1
Bismuth 212	0.321	U	0.621	0.622		1.06	pCi/g	09/04/13 13:12	09/04/13 19:11	1
Bismuth 214	**0.976**		0.188	0.214		0.183	pCi/g	09/04/13 13:12	09/04/13 19:11	1
Lead 212	**0.263**		0.0984	0.104		0.138	pCi/g	09/04/13 13:12	09/04/13 19:11	1
Lead 214	**0.916**		0.189	0.212		0.199	pCi/g	09/04/13 13:12	09/04/13 19:11	1
Potassium 40	**2.66**		0.912	0.951		1.39	pCi/g	09/04/13 13:12	09/04/13 19:11	1
Protactinium 231	0.0547	U	0.946	0.946		1.70	pCi/g	09/04/13 13:12	09/04/13 19:11	1
Radium 226	**0.976**		0.188	0.214	1.00	0.183	pCi/g	09/04/13 13:12	09/04/13 19:11	1
Thorium 234	**1.73**		0.719	0.741	1.00	1.62	pCi/g	09/04/13 13:12	09/04/13 19:11	1
Uranium 235	0.334	U	0.215	0.217		0.360	pCi/g	09/04/13 13:12	09/04/13 19:11	1
Protactinium 234m	0.995	U	5.12	5.12		10.2	pCi/g	09/04/13 13:12	09/04/13 19:11	1
Thorium 232	0.126	U	0.163	0.163		0.310	pCi/g	09/04/13 13:12	09/04/13 19:11	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*	*09/04/13 13:12*	*09/04/13 19:11*	*1*

Client Sample ID: L050105TUB00

Date Collected: 08/23/13 13:40
Date Received: 08/29/13 18:38

Lab Sample ID: 160-3570-2

Matrix: Solid
Percent Solids: 98.8

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	**0.00020**	**J**	0.00052	0.000016	mg/Kg	☼	08/30/13 10:44	09/03/13 20:20	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	**3.35**		0.142	0.348	1.05	0.179	pCi/g	08/30/13 10:44	09/03/13 20:20	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*97*		*30 - 110*	*08/30/13 10:44*	*09/03/13 20:20*	*1*

Client Sample ID: L050105TUB00

Lab Sample ID: 160-3570-2

Date Collected: 08/23/13 13:40

Matrix: Solid

Date Received: 08/29/13 18:38

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	**0.183**		0.0592	0.0621		0.114	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Americium 241	0.00981	U	0.0433	0.0433		0.0734	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Bismuth 212	0.0869	U	0.204	0.204		0.355	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Bismuth 214	**0.548**		0.0775	0.0962		0.0579	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Lead 212	**0.225**		0.0393	0.0489		0.0443	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Lead 214	**0.623**		0.0698	0.0952		0.0570	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Potassium 40	**6.75**		0.749	1.02		0.394	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Protactinium 231	0.116	U	0.207	0.207		0.700	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Radium 226	**0.548**		0.0775	0.0962	1.00	0.0579	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Thorium 234	**1.35**		0.626	0.642	1.00	0.733	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Uranium 235	0.118	U	0.109	0.109		0.165	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Protactinium 234m	0.200	U	0.674	0.674		4.48	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Thorium 232	**0.183**		0.0592	0.0621		0.114	pCi/g	09/04/13 13:12	09/04/13 23:13	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.0770*		*0.0256*	*0.0268*		*0.0266*	*pCi/g*	*09/04/13 13:12*	*09/04/13 23:13*	*1*

Client Sample ID: L050107TUB00

Lab Sample ID: 160-3570-3

Date Collected: 08/23/13 14:15

Matrix: Solid

Date Received: 08/29/13 18:38

Percent Solids: 94.4

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	**0.011**		0.0016	0.000049	mg/Kg	☼	08/30/13 10:44	09/04/13 07:53	2

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	**188**		7.85	29.3	3.28	0.562	pCi/g	08/30/13 10:44	09/04/13 07:53	2

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*65*		*30 - 110*	*08/30/13 10:44*	*09/04/13 07:53*	*2*

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	**0.146**		0.0663	0.0680		0.0640	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Americium 241	0.00267	U	0.0423	0.0423		0.0716	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Bismuth 212	0.0127	U	0.142	0.142		0.258	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Bismuth 214	**0.664**		0.0672	0.0963		0.0382	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Lead 212	**0.0985**		0.0289	0.0316		0.0414	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Lead 214	**0.775**		0.0609	0.101		0.0521	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Potassium 40	**3.08**		0.408	0.516		0.208	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Protactinium 231	0.0845	U	0.155	0.155		0.510	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Radium 226	**0.664**		0.0672	0.0963	1.00	0.0382	pCi/g	09/04/13 13:12	09/04/13 23:12	1

Client Sample ID: L050107TUB00

Lab Sample ID: 160-3570-3

Date Collected: 08/23/13 14:15

Matrix: Solid

Date Received: 08/29/13 18:38

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	**1.29**		0.281	0.312	1.00	0.632	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Uranium 235	**0.291**		0.0843	0.0894		0.123	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Protactinium 234m	0.911	U	1.82	1.82		2.83	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Thorium 232	**0.146**		0.0663	0.0680		0.0640	pCi/g	09/04/13 13:12	09/04/13 23:12	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.0312*		*0.0154*	*0.0157*		*0.0227*	*pCi/g*	*09/04/13 13:12*	*09/04/13 23:12*	*1*

Client Sample ID: L050109TUB00

Lab Sample ID: 160-3570-4

Date Collected: 08/23/13 13:05

Matrix: Solid

Date Received: 08/29/13 18:38

Percent Solids: 98.2

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	**0.0015**		0.0010	0.000031	mg/Kg	☼	08/30/13 10:44	09/04/13 07:57	2

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	**25.4**		0.748	2.52	2.08	0.356	pCi/g	08/30/13 10:44	09/04/13 07:57	2

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*97*		*30 - 110*	*08/30/13 10:44*	*09/04/13 07:57*	*2*

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	**0.145**		0.0499	0.0521		0.0730	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Americium 241	0.00460	U	0.0376	0.0376		0.0643	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Bismuth 212	0.0140	U	0.143	0.143		0.266	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Bismuth 214	**0.786**		0.0815	0.115		0.0436	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Lead 212	**0.113**		0.0294	0.0329		0.0394	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Lead 214	**0.867**		0.0697	0.114		0.0525	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Potassium 40	**2.05**		0.423	0.472		0.290	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Protactinium 231	0.0938	U	0.272	0.272		0.647	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Radium 226	**0.786**		0.0815	0.115	1.00	0.0436	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Thorium 234	**2.11**		0.304	0.376	1.00	0.612	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Uranium 235	**0.487**		0.122	0.132		0.158	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Protactinium 234m	1.65	U	2.01	2.02		3.21	pCi/g	09/04/13 13:12	09/04/13 23:12	1
Thorium 232	**0.145**		0.0499	0.0521		0.0730	pCi/g	09/04/13 13:12	09/04/13 23:12	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.0407*		*0.0152*	*0.0158*		*0.0177*	*pCi/g*	*09/04/13 13:12*	*09/04/13 23:12*	*1*

Client Sample ID: L050111TUB00

Lab Sample ID: 160-3570-5

Date Collected: 08/22/13 15:40
Matrix: Solid
Date Received: 08/29/13 18:38
Percent Solids: 96.3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.0015		0.00056	0.000017	mg/Kg	☼	08/30/13 10:44	09/03/13 20:39	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	25.4		0.160	2.52	1.13	0.193	pCi/g	08/30/13 10:44	09/03/13 20:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*93*		*30 - 110*	*08/30/13 10:44*	*09/03/13 20:39*	*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	0.154		0.0639	0.0658		0.113	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Americium 241	0.00994	U	0.0425	0.0425		0.0718	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Bismuth 212	0.100	U	0.205	0.205		0.353	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Bismuth 214	0.694		0.0774	0.106		0.0372	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Lead 212	0.200		0.0357	0.0441		0.0411	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Lead 214	0.654		0.0653	0.0942		0.0554	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Potassium 40	5.25		0.630	0.828		0.226	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Protactinium 231	0.0860	U	0.119	0.119		0.767	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Radium 226	0.694		0.0774	0.106	1.00	0.0372	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Thorium 234	1.27		0.326	0.352	1.00	0.633	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Uranium 235	0.463		0.155	0.162		0.167	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Protactinium 234m	1.83	U	2.47	2.47		4.08	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Thorium 232	0.154		0.0639	0.0658		0.113	pCi/g	09/04/13 13:12	09/04/13 23:13	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.0747*		*0.0290*	*0.0300*		*0.0276*	*pCi/g*	*09/04/13 13:12*	*09/04/13 23:13*	*1*

Client Sample ID: L050113TUB00

Lab Sample ID: 160-3570-6

Date Collected: 08/22/13 15:20
Matrix: Solid
Date Received: 08/29/13 18:38
Percent Solids: 96.1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.0015		0.000054	0.000016	mg/Kg	☼	09/04/13 09:58	09/04/13 16:03	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	25.0		0.390	2.44	1.09	0.186	pCi/g	09/04/13 09:58	09/04/13 16:03	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*96*		*30 - 110*	*09/04/13 09:58*	*09/04/13 16:03*	*1*

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

TestAmerica Job ID: 160-3570-1

Client Sample ID: L050113TUB00

Lab Sample ID: 160-3570-6

Date Collected: 08/22/13 15:20

Matrix: Solid

Date Received: 08/29/13 18:38

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	**0.163**		0.0529	0.0555		0.0761	pCi/g	09/04/13 13:12	09/04/13 23:50	1
Americium 241	0.00157	U	0.0395	0.0395		0.0669	pCi/g	09/04/13 13:12	09/04/13 23:50	1
Bismuth 212	0.149	U	0.147	0.147		0.233	pCi/g	09/04/13 13:12	09/04/13 23:50	1
Bismuth 214	**0.550**		0.0591	0.0822		0.0358	pCi/g	09/04/13 13:12	09/04/13 23:50	1
Lead 212	**0.173**		0.0277	0.0355		0.0307	pCi/g	09/04/13 13:12	09/04/13 23:50	1
Lead 214	**0.673**		0.0559	0.0895		0.0499	pCi/g	09/04/13 13:12	09/04/13 23:50	1
Potassium 40	**4.42**		0.494	0.670		0.261	pCi/g	09/04/13 13:12	09/04/13 23:50	1
Protactinium 231	0.137	U	0.279	0.279		0.630	pCi/g	09/04/13 13:12	09/04/13 23:50	1
Radium 226	**0.550**		0.0591	0.0822	1.00	0.0358	pCi/g	09/04/13 13:12	09/04/13 23:50	1
Thorium 234	**1.58**		0.265	0.313	1.00	0.533	pCi/g	09/04/13 13:12	09/04/13 23:50	1
Uranium 235	**0.265**		0.0767	0.0813		0.106	pCi/g	09/04/13 13:12	09/04/13 23:50	1
Protactinium 234m	1.23	U	1.90	1.91		3.28	pCi/g	09/04/13 13:12	09/04/13 23:50	1
Thorium 232	**0.163**		0.0529	0.0555		0.0761	pCi/g	09/04/13 13:12	09/04/13 23:50	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.0685*		*0.0169*	*0.0183*		*0.0149*	*pCi/g*	*09/04/13 13:12*	*09/04/13 23:50*	*1*

Client Sample ID: L050115TUB00

Lab Sample ID: 160-3570-7

Date Collected: 08/22/13 15:02

Matrix: Solid

Date Received: 08/29/13 18:38

Percent Solids: 95.5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	**0.0022**		0.00054	0.000016	mg/Kg	☼	08/30/13 10:44	09/03/13 20:47	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	**38.3**		1.43	3.96	1.08	0.186	pCi/g	08/30/13 10:44	09/03/13 20:47	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*96*		*30 - 110*	*08/30/13 10:44*	*09/03/13 20:47*	*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	**0.185**		0.0616	0.0644		0.0809	pCi/g	09/04/13 13:12	09/04/13 23:51	1
Americium 241	-0.00337	U	0.0424	0.0424		0.0716	pCi/g	09/04/13 13:12	09/04/13 23:51	1
Bismuth 212	**0.268**		0.171	0.173		0.255	pCi/g	09/04/13 13:12	09/04/13 23:51	1
Bismuth 214	**0.667**		0.0657	0.0955		0.0370	pCi/g	09/04/13 13:12	09/04/13 23:51	1
Lead 212	**0.199**		0.0344	0.0430		0.0443	pCi/g	09/04/13 13:12	09/04/13 23:51	1
Lead 214	**0.748**		0.0590	0.0976		0.0467	pCi/g	09/04/13 13:12	09/04/13 23:51	1
Potassium 40	**4.37**		0.457	0.639		0.185	pCi/g	09/04/13 13:12	09/04/13 23:51	1
Protactinium 231	0.101	U	0.126	0.127		0.672	pCi/g	09/04/13 13:12	09/04/13 23:51	1
Radium 226	**0.667**		0.0657	0.0955	1.00	0.0370	pCi/g	09/04/13 13:12	09/04/13 23:51	1

Client Sample ID: L050115TUB00

Lab Sample ID: 160-3570-7

Date Collected: 08/22/13 15:02

Matrix: Solid

Date Received: 08/29/13 18:38

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	1.79		0.313	0.365	1.00	0.609	pCi/g	09/04/13 13:12	09/04/13 23:51	1
Uranium 235	0.533		0.111	0.123		0.147	pCi/g	09/04/13 13:12	09/04/13 23:51	1
Protactinium 234m	3.79		2.11	2.14		2.89	pCi/g	09/04/13 13:12	09/04/13 23:51	1
Thorium 232	0.185		0.0616	0.0644		0.0809	pCi/g	09/04/13 13:12	09/04/13 23:51	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.0878*		*0.0220*	*0.0238*		*0.0200*	*pCi/g*	*09/04/13 13:12*	*09/04/13 23:51*	*1*

Client Sample ID: L050117TUB00

Lab Sample ID: 160-3570-8

Date Collected: 08/22/13 14:20

Matrix: Solid

Date Received: 08/29/13 18:38

Percent Solids: 88.3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00049	J	0.00061	0.000018	mg/Kg	☼	08/30/13 10:44	09/03/13 20:51	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	8.45		0.275	0.892	1.22	0.209	pCi/g	08/30/13 10:44	09/03/13 20:51	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*92*		*30 - 110*	*08/30/13 10:44*	*09/03/13 20:51*	*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	0.746		0.107	0.131		0.0884	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Americium 241	0.00169	U	0.0499	0.0499		0.0845	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Bismuth 212	1.07		0.338	0.356		0.287	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Bismuth 214	0.632		0.0772	0.101		0.0560	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Lead 212	0.714		0.0587	0.109		0.0538	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Lead 214	0.746		0.0773	0.109		0.0582	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Potassium 40	14.5		0.983	1.78		0.335	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Protactinium 231	0.383	U	0.244	0.248		0.953	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Radium 226	0.632		0.0772	0.101	1.00	0.0560	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Thorium 234	2.02		0.626	0.661	1.00	0.769	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Uranium 235	0.403		0.127	0.133		0.194	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Protactinium 234m	1.97	U	2.75	2.76		4.23	pCi/g	09/04/13 13:12	09/04/13 23:13	1
Thorium 232	0.746		0.107	0.131		0.0884	pCi/g	09/04/13 13:12	09/04/13 23:13	1

Other Detected Radionuclides	*Result*	*Qualifier*	*Count Uncert. (2σ+/-)*	*Total Uncert. (2σ+/-)*	*RL*	*MDC*	*Unit*	*Prepared*	*Analyzed*	*Dil Fac*
Tl-208	*0.217*		*0.0354*	*0.0420*		*0.0278*	*pCi/g*	*09/04/13 13:12*	*09/04/13 23:13*	*1*

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

Lab Sample ID: MB 160-69983/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 70530 — **Prep Batch: 69983**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00050	0.000015	mg/Kg		08/30/13 10:44	09/03/13 19:22	1

Lab Sample ID: LCS 160-69983/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 70530 — **Prep Batch: 69983**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	0.00237	0.00248		mg/Kg		104	80 - 120

Lab Sample ID: 160-3571-A-21-C MS — **Client Sample ID: Matrix Spike**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 70530 — **Prep Batch: 69983**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	0.000025	J	0.00316	0.00298		mg/Kg	☼	93	75 - 125

Lab Sample ID: 160-3571-A-21-D MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 70530 — **Prep Batch: 69983**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Technetium 99	0.000025	J	0.00311	0.00292		mg/Kg	☼	93	75 - 125	2	30

Lab Sample ID: MB 160-70525/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 70773 — **Prep Batch: 70525**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000051	0.000015	mg/Kg		09/04/13 07:26	09/04/13 13:26	1

Lab Sample ID: LCS 160-70525/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 70773 — **Prep Batch: 70525**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	0.00236	0.00251		mg/Kg		106	80 - 120

Lab Sample ID: 160-3600-A-1-B MS — **Client Sample ID: Matrix Spike**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 70773 — **Prep Batch: 70525**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	ND		0.00295	0.00286		mg/Kg	☼	97	75 - 125

Lab Sample ID: 160-3600-A-1-C MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 70773 — **Prep Batch: 70525**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Technetium 99	ND		0.00306	0.00286		mg/Kg	☼	93	75 - 125	0	30

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

Lab Sample ID: MB 160-69983/1-A
Matrix: Solid
Analysis Batch: 70531

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 69983

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.1284	U	0.0449	0.0456	0.991	0.170	pCi/g	08/30/13 10:44	09/03/13 19:22	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*102*		*30 - 110*	*08/30/13 10:44*	*09/03/13 19:22*	*1*

Lab Sample ID: LCS 160-69983/2-A
Matrix: Solid
Analysis Batch: 70531

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 69983

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Technetium 99			40.7	42.40		3.96	1.02	0.174	pCi/g	104	80 - 120		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Re	*99*		*30 - 110*

Lab Sample ID: 160-3571-A-21-C MS
Matrix: Solid
Analysis Batch: 70531

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 69983

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Technetium 99	0.435		54.1	50.98		5.57	1.35	0.231	pCi/g	93	75 - 125		

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

Lab Sample ID: 160-3571-A-21-D MSD
Matrix: Solid
Analysis Batch: 70531

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 69983

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	0.435		53.3	49.98		5.13	1.33	0.228	pCi/g	93	75 - 125	0.09	1

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

Lab Sample ID: MB 160-70525/1-A
Matrix: Solid
Analysis Batch: 70774

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 70525

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.04320	U	0.0290	0.0296	1.01	0.174	pCi/g	09/04/13 07:26	09/04/13 13:26	1

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

Lab Sample ID: MB 160-70525/1-A
Matrix: Solid
Analysis Batch: 70774

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 70525

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	99		30 - 110	09/04/13 07:26	09/04/13 13:26	1

Lab Sample ID: LCS 160-70525/2-A
Matrix: Solid
Analysis Batch: 70774

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 70525

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Technetium 99			40.3	42.90		3.99	1.01	0.173	pCi/g	106	80 - 120		

Carrier	LCS %Yield	LCS Qualifier	Limits
Re	99		30 - 110

Lab Sample ID: 160-3600-A-1-B MS
Matrix: Solid
Analysis Batch: 70774

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 70525

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Technetium 99	0.0647	U	50.4	49.02		5.31	1.26	0.216	pCi/g	97	75 - 125		

Carrier	MS %Yield	MS Qualifier	Limits
Re	91		30 - 110

Lab Sample ID: 160-3600-A-1-C MSD
Matrix: Solid
Analysis Batch: 70774

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 70525

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	0.0647	U	52.5	48.96		5.44	1.31	0.224	pCi/g	93	75 - 125	0.01	1

Carrier	MSD %Yield	MSD Qualifier	Limits
Re	88		30 - 110

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

Lab Sample ID: MB 160-70600/1-A
Matrix: Solid
Analysis Batch: 70572

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 70600

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.008675	U	0.0191	0.0191		0.0465	pCi/g	09/04/13 13:12	09/04/13 21:58	1
Americium 241	0.008474	U	0.0114	0.0114		0.0189	pCi/g	09/04/13 13:12	09/04/13 21:58	1
Bismuth 212	0.001267	U	0.0575	0.0575		0.122	pCi/g	09/04/13 13:12	09/04/13 21:58	1
Bismuth 214	-0.01059	U	0.0879	0.0879		0.0396	pCi/g	09/04/13 13:12	09/04/13 21:58	1

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

Lab Sample ID: MB 160-70600/1-A
Matrix: Solid
Analysis Batch: 70572

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 70600

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Lead 212	0.006140	U	0.00975	0.00978		0.0188	pCi/g	09/04/13 13:12	09/04/13 21:58	1
Lead 214	-0.01411	U	0.470	0.470		0.0346	pCi/g	09/04/13 13:12	09/04/13 21:58	1
Potassium 40	-0.03629	U	0.180	0.180		0.239	pCi/g	09/04/13 13:12	09/04/13 21:58	1
Protactinium 231	-0.0007753	U	0.159	0.159		0.299	pCi/g	09/04/13 13:12	09/04/13 21:58	1
Radium 226	-0.01059	U	0.0879	0.0879	1.00	0.0396	pCi/g	09/04/13 13:12	09/04/13 21:58	1
Thorium 234	0.01706	U	0.107	0.107	1.00	0.224	pCi/g	09/04/13 13:12	09/04/13 21:58	1
Uranium 235	0.0001144	U	0.000412	0.000412		0.0675	pCi/g	09/04/13 13:12	09/04/13 21:58	1
Protactinium 234m	0.1530	U	0.923	0.923		2.00	pCi/g	09/04/13 13:12	09/04/13 21:58	1
Thorium 232	0.008675	U	0.0191	0.0191		0.0465	pCi/g	09/04/13 13:12	09/04/13 21:58	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*	*09/04/13 13:12*	*09/04/13 21:58*	*1*

Lab Sample ID: LCS 160-70600/2-A
Matrix: Solid
Analysis Batch: 70581

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 70600

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Americium 241			97.7	92.66		9.64		0.473	pCi/g	95	87 - 116		
Cesium 137			31.6	30.45		3.19	0.200	0.151	pCi/g	96	87 - 120		
Cobalt 60			24.7	23.85		2.41		0.0926	pCi/g	97	87 - 115		

Lab Sample ID: 160-3570-8 DU
Matrix: Solid
Analysis Batch: 70581

Client Sample ID: L050117TUB00
Prep Type: Total/NA
Prep Batch: 70600

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Actinium 228	0.746			0.7632		0.131		0.0839	pCi/g			0.07	1
Americium 241	0.00169	U		-0.00281 7	U	0.133		0.0903	pCi/g			0.02	1
Bismuth 212	1.07			1.003		0.418		0.377	pCi/g			0.09	1
Bismuth 214	0.632			0.6603		0.114		0.0643	pCi/g			0.13	1
Lead 212	0.714			0.6978		0.109		0.0519	pCi/g			0.07	1
Lead 214	0.746			0.6657		0.0985		0.0592	pCi/g			0.39	1
Potassium 40	14.5			13.92		1.77		0.247	pCi/g			0.15	1
Protactinium 231	0.383	U		0.1268	U	0.117		1.06	pCi/g			0.70	1
Radium 226	0.632			0.6603		0.114	1.00	0.0643	pCi/g			0.13	1
Thorium 234	2.02			1.647		0.373	1.00	0.779	pCi/g			0.36	1
Uranium 235	0.403			0.4261		0.169		0.189	pCi/g			0.08	1
Protactinium 234m	1.97	U		3.462	U	2.95		4.55	pCi/g			0.26	1
Thorium 232	0.746			0.7632		0.131		0.0839	pCi/g			0.07	1

Metals

Prep Batch: 69983

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3570-1	L050101TUB00	Total/NA	Solid	None	
160-3570-2	L050105TUB00	Total/NA	Solid	None	
160-3570-3	L050107TUB00	Total/NA	Solid	None	
160-3570-4	L050109TUB00	Total/NA	Solid	None	
160-3570-5	L050111TUB00	Total/NA	Solid	None	
160-3570-7	L050115TUB00	Total/NA	Solid	None	
160-3570-8	L050117TUB00	Total/NA	Solid	None	
160-3571-A-21-C MS	Matrix Spike	Total/NA	Solid	None	
160-3571-A-21-D MSD	Matrix Spike Duplicate	Total/NA	Solid	None	
LCS 160-69983/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-69983/1-A	Method Blank	Total/NA	Solid	None	

Prep Batch: 70525

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3570-6 - RE	L050113TUB00	Total/NA	Solid	None	
160-3600-A-1-B MS	Matrix Spike	Total/NA	Solid	None	
160-3600-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Solid	None	
LCS 160-70525/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-70525/1-A	Method Blank	Total/NA	Solid	None	

Analysis Batch: 70530

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3570-1	L050101TUB00	Total/NA	Solid	6020A	69983
160-3570-2	L050105TUB00	Total/NA	Solid	6020A	69983
160-3570-3	L050107TUB00	Total/NA	Solid	6020A	69983
160-3570-4	L050109TUB00	Total/NA	Solid	6020A	69983
160-3570-5	L050111TUB00	Total/NA	Solid	6020A	69983
160-3570-7	L050115TUB00	Total/NA	Solid	6020A	69983
160-3570-8	L050117TUB00	Total/NA	Solid	6020A	69983
160-3571-A-21-C MS	Matrix Spike	Total/NA	Solid	6020A	69983
160-3571-A-21-D MSD	Matrix Spike Duplicate	Total/NA	Solid	6020A	69983
LCS 160-69983/2-A	Lab Control Sample	Total/NA	Solid	6020A	69983
MB 160-69983/1-A	Method Blank	Total/NA	Solid	6020A	69983

Analysis Batch: 70773

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3570-6 - RE	L050113TUB00	Total/NA	Solid	6020A	70525
160-3600-A-1-B MS	Matrix Spike	Total/NA	Solid	6020A	70525
160-3600-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Solid	6020A	70525
LCS 160-70525/2-A	Lab Control Sample	Total/NA	Solid	6020A	70525
MB 160-70525/1-A	Method Blank	Total/NA	Solid	6020A	70525

General Chemistry

Analysis Batch: 70086

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3570-1	L050101TUB00	Total/NA	Solid	Moisture	
160-3570-1 DU	L050101TUB00	Total/NA	Solid	Moisture	
160-3570-2	L050105TUB00	Total/NA	Solid	Moisture	
160-3570-3	L050107TUB00	Total/NA	Solid	Moisture	

General Chemistry (Continued)

Analysis Batch: 70086 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3570-4	L050109TUB00	Total/NA	Solid	Moisture	
160-3570-5	L050111TUB00	Total/NA	Solid	Moisture	
160-3570-6	L050113TUB00	Total/NA	Solid	Moisture	
160-3570-7	L050115TUB00	Total/NA	Solid	Moisture	
160-3570-8	L050117TUB00	Total/NA	Solid	Moisture	

Rad

Leach Batch: 69978

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3570-1	L050101TUB00	Total/NA	Solid	Dry and Grind	
160-3570-2	L050105TUB00	Total/NA	Solid	Dry and Grind	
160-3570-3	L050107TUB00	Total/NA	Solid	Dry and Grind	
160-3570-4	L050109TUB00	Total/NA	Solid	Dry and Grind	
160-3570-5	L050111TUB00	Total/NA	Solid	Dry and Grind	
160-3570-6	L050113TUB00	Total/NA	Solid	Dry and Grind	
160-3570-7	L050115TUB00	Total/NA	Solid	Dry and Grind	
160-3570-8	L050117TUB00	Total/NA	Solid	Dry and Grind	
160-3570-8 DU	L050117TUB00	Total/NA	Solid	Dry and Grind	

Prep Batch: 69983

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3570-1	L050101TUB00	Total/NA	Solid	None	
160-3570-2	L050105TUB00	Total/NA	Solid	None	
160-3570-3	L050107TUB00	Total/NA	Solid	None	
160-3570-4	L050109TUB00	Total/NA	Solid	None	
160-3570-5	L050111TUB00	Total/NA	Solid	None	
160-3570-7	L050115TUB00	Total/NA	Solid	None	
160-3570-8	L050117TUB00	Total/NA	Solid	None	
160-3571-A-21-C MS	Matrix Spike	Total/NA	Solid	None	
160-3571-A-21-D MSD	Matrix Spike Duplicate	Total/NA	Solid	None	
LCS 160-69983/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-69983/1-A	Method Blank	Total/NA	Solid	None	

Prep Batch: 70525

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3570-6 - RE	L050113TUB00	Total/NA	Solid	None	
160-3600-A-1-B MS	Matrix Spike	Total/NA	Solid	None	
160-3600-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Solid	None	
LCS 160-70525/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-70525/1-A	Method Blank	Total/NA	Solid	None	

Prep Batch: 70600

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3570-1	L050101TUB00	Total/NA	Solid	Fill_Geo-0	69978
160-3570-2	L050105TUB00	Total/NA	Solid	Fill_Geo-0	69978
160-3570-3	L050107TUB00	Total/NA	Solid	Fill_Geo-0	69978
160-3570-4	L050109TUB00	Total/NA	Solid	Fill_Geo-0	69978
160-3570-5	L050111TUB00	Total/NA	Solid	Fill_Geo-0	69978
160-3570-6	L050113TUB00	Total/NA	Solid	Fill_Geo-0	69978

Rad (Continued)

Prep Batch: 70600 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3570-7	L050115TUB00	Total/NA	Solid	Fill_Geo-0	69978
160-3570-8	L050117TUB00	Total/NA	Solid	Fill_Geo-0	69978
160-3570-8 DU	L050117TUB00	Total/NA	Solid	Fill_Geo-0	69978
LCS 160-70600/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-0	
MB 160-70600/1-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: 160-3570-1

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)							
160-3570-1	L050101TUB00	96							
160-3570-2	L050105TUB00	97							
160-3570-3	L050107TUB00	65							
160-3570-4	L050109TUB00	97							
160-3570-5	L050111TUB00	93							
160-3570-6 - RE	L050113TUB00	96							
160-3570-7	L050115TUB00	96							
160-3570-8	L050117TUB00	92							
160-3571-A-21-C MS	Matrix Spike	90							
160-3571-A-21-D MSD	Matrix Spike Duplicate	90							
160-3600-A-1-B MS	Matrix Spike	91							
160-3600-A-1-C MSD	Matrix Spike Duplicate	88							
LCS 160-69983/2-A	Lab Control Sample	99							
LCS 160-70525/2-A	Lab Control Sample	99							
MB 160-69983/1-A	Method Blank	102							
MB 160-70525/1-A	Method Blank	99							

Tracer/Carrier Legend

Re = Re