

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: 160-4164-1

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:
10/22/2013 3:59:07 PM

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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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Case Narrative

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

TestAmerica Job ID: 160-4164-1

Job ID: 160-4164-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Westinghouse Electric Company LLC

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

Report Number: 160-4164-1

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 10/18/2013; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.0 C.

TECHNETIUM-99 (ICPMS)

Samples L0501119TUB0 (160-4164-1) and L0501120TUB0 (160-4164-2) were analyzed for Technetium-99 (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared and analyzed on 10/21/2013.

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

PERCENT SOLIDS

Samples L0501119TUB0 (160-4164-1) and L0501120TUB0 (160-4164-2) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 10/21/2013.

Case Narrative

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

TestAmerica Job ID: 160-4164-1

Job ID: 160-4164-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

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

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Hematite Decommissioning Project

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

Revision: 3

Westinghouse Non-Proprietary Class 3

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

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

Chain of Custody ID No. F-101813-01 Page 1/1				Requested Analysis								Laboratory Name:			
Project Name: Westinghouse Electric Company				Comp (C) or Grab (G)	Gamma Spec	Isotopic Uranium	Tc-99	Gamma Spec (21 day ingrow for Ra-226)					Total Containers	TA-MO	
Contact Person: Gerald Rood														Laboratory Address: 13715 Rider Trail North	
Phone Number: 314-810-3382														Phone No. 314-298-8566	
Sampler Name Andrew Schooley														Laboratory Contact Person: Joe Walker	
Phone No. 708-870-8453				Phone No. 708-870-8453											
				Turn Around Time											
				Rush ^{10/18/13} ✓ (7 days) 3 days											
				Remarks											
Sample ID	Date	Time	Matrix												
L0501119TUB0	10/18/2013	10:50		C			X						1	LSA-05-01 Bias	
L0501120TUB0	10/18/2013	10:55		C			X						1	LSA-05-01 Bias	
Relinquished by: <i>[Signature]</i>		Date/Time 10-18-13 16:05		Received by: <i>[Signature]</i>		Date/Time 10-18 16:05		Total 2		Cooler Temperature: Ambient					
Company Name: WEL				Company Name: Crossroads				Cooler ID: 1017-01		Shipper and Number:					
Received by:		Date/Time		Relinquished by: <i>[Signature]</i>		Date/Time 10-18 17:35		0		Verified By: <i>[Signature]</i>					
Company Name:				Company Name: Crossroads											
Relinquished by:		Date/Time		Received by: <i>[Signature]</i>		Date/Time 10-18-13 17:35									
Company Name:				Company Name: Crossroads											

4164



Login Sample Receipt Checklist

Client: Westinghouse Electric Company LLC

Job Number: 160-4164-1

Login Number: 4164

List Source: TestAmerica St. Louis

List Number: 1

Creator: Clarke, Jill C

Question	Answer	Comment
Radioactivity wasn't checked or is \leq 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.	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 $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Definitions/Glossary

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

TestAmerica Job ID: 160-4164-1

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.
α	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: 160-4164-1

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

Protocol References:

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

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Sample Summary

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

TestAmerica Job ID: 160-4164-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-4164-1	L0501119TUB0	Solid	10/18/13 10:50	10/18/13 18:30
160-4164-2	L0501120TUB0	Solid	10/18/13 10:55	10/18/13 18:30

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Client Sample Results

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

TestAmerica Job ID: 160-4164-1

Client Sample ID: L0501119TUB0

Lab Sample ID: 160-4164-1

Date Collected: 10/18/13 10:50

Matrix: Solid

Date Received: 10/18/13 18:30

Percent Solids: 80.8

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000070	0.000021	mg/Kg	☼	10/21/13 09:17	10/21/13 20:12	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	0.331		0.0412	0.0571	1.39	0.238	pCi/g	10/21/13 09:17	10/21/13 20:12	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	90		30 - 110					10/21/13 09:17	10/21/13 20:12	1

Client Sample ID: L0501120TUB0

Lab Sample ID: 160-4164-2

Date Collected: 10/18/13 10:55

Matrix: Solid

Date Received: 10/18/13 18:30

Percent Solids: 79.1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.000026	J	0.000068	0.000020	mg/Kg	☼	10/21/13 09:17	10/21/13 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	0.450		0.0791	0.0958	1.37	0.234	pCi/g	10/21/13 09:17	10/21/13 20:16	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	93		30 - 110					10/21/13 09:17	10/21/13 20:16	1

QC Sample Results

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

TestAmerica Job ID: 160-4164-1

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

Lab Sample ID: MB 160-79762/1-A
Matrix: Solid
Analysis Batch: 80367

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 79762

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000053	0.000016	mg/Kg		10/18/13 14:54	10/21/13 19:06	1

Lab Sample ID: LCS 160-79762/2-A
Matrix: Solid
Analysis Batch: 80367

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 79762

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	0.00232	0.00232		mg/Kg		100	80 - 120

Lab Sample ID: 160-4137-A-41-D MS
Matrix: Solid
Analysis Batch: 80367

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 79762

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	ND		0.00282	0.00278		mg/Kg	☼	99	75 - 125

Lab Sample ID: 160-4137-A-41-E MSD
Matrix: Solid
Analysis Batch: 80367

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 79762

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Technetium 99	ND		0.00281	0.00281		mg/Kg	☼	100	75 - 125	1	30

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

Lab Sample ID: MB 160-79762/1-A
Matrix: Solid
Analysis Batch: 80368

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 79762

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.001826	U	0.0263	0.0280	1.07	0.183	pCi/g	10/18/13 14:54	10/21/13 19:06	1
Carrier	MB %Yield	MB Qualifier	Limits							
Re	94		30 - 110							
								Prepared	Analyzed	Dil Fac
								10/18/13 14:54	10/21/13 19:06	1

Lab Sample ID: LCS 160-79762/2-A
Matrix: Solid
Analysis Batch: 80368

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 79762

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	39.7	39.64		4.00	1.04	0.179	pCi/g	100	80 - 120
Carrier	LCS %Yield	LCS Qualifier	Limits						
Re	95		30 - 110						

TestAmerica St. Louis

QC Sample Results

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

TestAmerica Job ID: 160-4164-1

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

Lab Sample ID: 160-4137-A-41-D MS

Matrix: Solid

Analysis Batch: 80368

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Batch: 79762

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	0.0346	U	48.3	47.64		5.64	1.38	0.236	pCi/g	99	75 - 125
Carrier	MS %Yield	MS Qualifier	Limits								
Re	88		30 - 110								

Lab Sample ID: 160-4137-A-41-E MSD

Matrix: Solid

Analysis Batch: 80368

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 79762

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	0.0346	U	48.1	48.16		5.68	1.39	0.238	pCi/g	100	75 - 125	0.05	1
Carrier	MSD %Yield	MSD Qualifier	Limits										
Re	86		30 - 110										

QC Association Summary

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

TestAmerica Job ID: 160-4164-1

Metals

Prep Batch: 79762

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-4137-A-41-D MS	Matrix Spike	Total/NA	Solid	None	
160-4137-A-41-E MSD	Matrix Spike Duplicate	Total/NA	Solid	None	
160-4164-1	L0501119TUB0	Total/NA	Solid	None	
160-4164-2	L0501120TUB0	Total/NA	Solid	None	
LCS 160-79762/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-79762/1-A	Method Blank	Total/NA	Solid	None	

Analysis Batch: 80367

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-4137-A-41-D MS	Matrix Spike	Total/NA	Solid	6020A	79762
160-4137-A-41-E MSD	Matrix Spike Duplicate	Total/NA	Solid	6020A	79762
160-4164-1	L0501119TUB0	Total/NA	Solid	6020A	79762
160-4164-2	L0501120TUB0	Total/NA	Solid	6020A	79762
LCS 160-79762/2-A	Lab Control Sample	Total/NA	Solid	6020A	79762
MB 160-79762/1-A	Method Blank	Total/NA	Solid	6020A	79762

General Chemistry

Analysis Batch: 79909

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-4164-1	L0501119TUB0	Total/NA	Solid	Moisture	
160-4164-2	L0501120TUB0	Total/NA	Solid	Moisture	
160-4164-2 DU	L0501120TUB0	Total/NA	Solid	Moisture	

Rad

Prep Batch: 79762

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-4137-A-41-D MS	Matrix Spike	Total/NA	Solid	None	
160-4137-A-41-E MSD	Matrix Spike Duplicate	Total/NA	Solid	None	
160-4164-1	L0501119TUB0	Total/NA	Solid	None	
160-4164-2	L0501120TUB0	Total/NA	Solid	None	
LCS 160-79762/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-79762/1-A	Method Blank	Total/NA	Solid	None	

Tracer/Carrier Summary

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

TestAmerica Job ID: 160-4164-1

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)
160-4137-A-41-D MS	Matrix Spike	88
160-4137-A-41-E MSD	Matrix Spike Duplicate	86
160-4164-1	L0501119TUB0	90
160-4164-2	L0501120TUB0	93
LCS 160-79762/2-A	Lab Control Sample	95
MB 160-79762/1-A	Method Blank	94

Tracer/Carrier Legend

Re = Re