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ANALYTICAL REPORT

Eurofins TestAmerica, Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

Laboratory Job ID: 490-164124-1
Client Project/Site: CUF_BS_20181129_1B
Revision: 1

For:
Environmental Standards Inc.
1140 Valley Forge Road
PO BOX 810
Valley Forge, Pennsylvania 19482-0810

Attn: Jennifer N. Gable

Authorized for release by:
4/18/2019 5:56:04 PM

Gail Lage, Senior Project Manager
(615)301-5741
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LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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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Sample Summary

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181129_1B

Job ID: 490-164124-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-164124-1	CUF-BS-CUF1000ALTA-13.5/15.0-20181129	Solid	11/29/18 13:50	11/30/18 15:10
490-164124-2	CUF-BS-CUF1000ALTA-18.0/19.5-20181129	Solid	11/29/18 14:26	11/30/18 15:10
490-164124-3	CUF-BS-FB08-20181129	Water	11/29/18 16:09	11/30/18 15:10

Case Narrative

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181129_1B

Job ID: 490-164124-1

Job ID: 490-164124-1

Laboratory: Eurofins TestAmerica, Nashville

Narrative

Job Narrative
490-164124-1

Revised Report
This report was revised to adjust the solid sample results for dry weight using the dry weight results from TA-Nashville. This replaces the previous final report.

Receipt
The samples were received on 11/30/2018 3:10 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.5º C.

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

Definitions/Glossary

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181129_1B

Job ID: 490-164124-1

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
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 (Radiochemistry)
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)

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181129_1B

Job ID: 490-164124-1

Client Sample ID: CUF-BS-CUF1000ALTA-13.5/15.0-20181129

Lab Sample ID: 490-164124-1

Date Collected: 11/29/18 13:50
Date Received: 11/30/18 15:10

Matrix: Solid

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**4.31**		0.410	0.607	1.00	0.184	pCi/g	12/05/18 17:49	12/26/18 09:17	1
Radium-228	0.181	U	0.324	0.324		0.421	pCi/g	12/05/18 17:49	12/26/18 09:17	1
Radium 226 and Radium 228	**4.49**		0.523	0.688		0.421	pCi/g	12/05/18 17:49	12/26/18 09:17	1

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181129_1B

Job ID: 490-164124-1

Client Sample ID: CUF-BS-CUF1000ALTA-18.0/19.5-20181129

Lab Sample ID: 490-164124-2

Date Collected: 11/29/18 14:26

Matrix: Solid

Date Received: 11/30/18 15:10

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	2.14		0.339	0.406	1.00	0.208	pCi/g	12/05/18 17:49	12/26/18 09:19	1
Radium-228	0.992		0.261	0.280		0.277	pCi/g	12/05/18 17:49	12/26/18 09:19	1
Radium 226 and Radium 228	3.13		0.428	0.493		0.277	pCi/g	12/05/18 17:49	12/26/18 09:19	1

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181129_1B

Job ID: 490-164124-1

Client Sample ID: CUF-BS-FB08-20181129

Lab Sample ID: 490-164124-3

Date Collected: 11/29/18 16:09

Matrix: Water

Date Received: 11/30/18 15:10

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-11.5	U	18.9	18.9	50.0	32.1	pCi/L	12/06/18 11:00	12/27/18 08:38	1
Radium-228	16.3	U	14.0	14.1	50.0	23.0	pCi/L	12/06/18 11:00	12/27/18 08:38	1
Radium 226 and Radium 228	16.3	U	14.0	14.1			pCi/L	12/06/18 11:00	12/27/18 08:38	1

QC Sample Results

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181129_1B

Job ID: 490-164124-1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-404246/1-A
Matrix: Solid
Analysis Batch: 407528

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 404246

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.04085	U	0.0441	0.0444	1.00	0.326	pCi/g	12/05/18 17:49	12/26/18 07:52	1
Radium-228	-0.02610	U	0.149	0.149		0.200	pCi/g	12/05/18 17:49	12/26/18 07:52	1
Radium 226 and Radium 228	0.04085	U	0.04410	0.04440			pCi/g	12/05/18 17:49	12/26/18 07:52	1

Lab Sample ID: LCS 160-404246/2-A
Matrix: Solid
Analysis Batch: 407518

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 404246

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium-241	96.7	99.47		11.7		1.31	pCi/g	103	87 - 116
Cesium-137	28.0	31.19		3.27		0.256	pCi/g	112	87 - 120
Cobalt-60	12.3	13.02		1.36		0.149	pCi/g	106	87 - 115

Lab Sample ID: 490-164123-A-2-B DU
Matrix: Solid
Analysis Batch: 407519

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 404246

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium-226	0.796		0.7688		0.188	1.00	0.133	pCi/g	0.06	1
Radium-228	1.10		1.130		0.246		0.215	pCi/g	0.05	1
Radium 226 and Radium 228	1.90		1.899		0.310		0.215	pCi/g	0	

Lab Sample ID: MB 160-404273/1-A
Matrix: Water
Analysis Batch: 407584

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 404273

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-12.95	U	17.2	17.2	50.0	37.8	pCi/L	12/06/18 11:00	12/27/18 05:49	1
Radium-228	7.262	U	17.5	17.5	50.0	31.2	pCi/L	12/06/18 11:00	12/27/18 05:49	1
Radium 226 and Radium 228	7.262	U	17.5	17.5			pCi/L	12/06/18 11:00	12/27/18 05:49	1

Lab Sample ID: LCS 160-404273/2-A
Matrix: Water
Analysis Batch: 407584

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 404273

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium-241	136000	133500		15400		291	pCi/L	98	90 - 111
Cesium-137	45000	44330		4440		98.3	pCi/L	98	90 - 111
Cobalt-60	31100	30320		3000		52.9	pCi/L	97	89 - 110

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: 490-164123-A-1-B DU
Matrix: Water
Analysis Batch: 407586

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 404273

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-226	-5.32	U		6.222	U	12.8	50.0	15.8	pCi/L			0.35	1
Radium-228	6.59	U		24.07	U	13.4	50.0	26.2	pCi/L			0.60	1
Radium 226 and Radium 228	6.59	U		30.29		18.5			pCi/L			0.54	

QC Association Summary

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181129_1B

Job ID: 490-164124-1

Rad

Prep Batch: 404246

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-164124-1	CUF-BS-CUF1000ALTA-13.5/15.0-20181129	Total/NA	Solid	Fill_Geo-21	
490-164124-2	CUF-BS-CUF1000ALTA-18.0/19.5-20181129	Total/NA	Solid	Fill_Geo-21	
MB 160-404246/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-404246/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
490-164123-A-2-B DU	Duplicate	Total/NA	Solid	Fill_Geo-21	

Prep Batch: 404273

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-164124-3	CUF-BS-FB08-20181129	Total/NA	Water	Fill_Geo-21	
MB 160-404273/1-A	Method Blank	Total/NA	Water	Fill_Geo-21	
LCS 160-404273/2-A	Lab Control Sample	Total/NA	Water	Fill_Geo-21	
490-164123-A-1-B DU	Duplicate	Total/NA	Water	Fill_Geo-21	

Lab Chronicle

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181129_1B

Job ID: 490-164124-1

Client Sample ID: CUF-BS-CUF1000ALTA-13.5/15.0-20181129 — Lab Sample ID: 490-164124-1

Date Collected: 11/29/18 13:50 — **Matrix: Solid**
Date Received: 11/30/18 15:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Fill_Geo-21			316.5 g	1.0 g	404246	12/05/18 17:49	SJS	TAL SL
Total/NA	Analysis	901.1		1			407521	12/26/18 09:17	KLS	TAL SL

Client Sample ID: CUF-BS-CUF1000ALTA-18.0/19.5-20181129 — Lab Sample ID: 490-164124-2

Date Collected: 11/29/18 14:26 — **Matrix: Solid**
Date Received: 11/30/18 15:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Fill_Geo-21			386.9 g	1.0 g	404246	12/05/18 17:49	SJS	TAL SL
Total/NA	Analysis	901.1		1			407522	12/26/18 09:19	CDR	TAL SL

Client Sample ID: CUF-BS-FB08-20181129 — Lab Sample ID: 490-164124-3

Date Collected: 11/29/18 16:09 — **Matrix: Water**
Date Received: 11/30/18 15:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Fill_Geo-21			1000 mL	1.0 mL	404273	12/06/18 11:00	PK	TAL SL
Total/NA	Analysis	901.1		1			407586	12/27/18 08:38	KLS	TAL SL

Laboratory References:

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

Method Summary

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181129_1B

Job ID: 490-164124-1

Method	Method Description	Protocol	Laboratory
901.1	Radium-226 & Other Gamma Emitters (GS)	EPA	TAL SL
Fill_Geo-21	Fill Geometry, 21-Day In-Growth	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

Laboratory References:

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

Accreditation/Certification Summary

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181129_1B

Job ID: 490-164124-1

Laboratory: Eurofins TestAmerica, Nashville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	ISO/IEC 17025		0453.07	12-31-19
Alaska (UST)	State Program	10	UST-087	06-30-19
Arizona	State Program	9	AZ0473	05-05-19
Arkansas DEQ	State Program	6	88-0737	04-25-20
California	State Program	9	2938	06-30-19
Connecticut	State Program	1	PH-0220	12-31-19
Florida	NELAP	4	E87358	06-30-19
Georgia	State Program	4	NA: NELAP & A2LA	12-31-19
Illinois	NELAP	5	200010	12-09-19
Iowa	State Program	7	131	04-01-20
Kansas	NELAP	7	E-10229	10-31-19
Kentucky (UST)	State Program	4	19	06-30-19
Kentucky (WW)	State Program	4	90038	12-31-19
Louisiana	NELAP	6	30613	06-30-19
Maine	State Program	1	TN00032	11-03-19
Maryland	State Program	3	316	03-31-20
Massachusetts	State Program	1	M-TN032	06-30-19
Minnesota	NELAP	5	047-999-345	12-31-19
Mississippi	State Program	4	N/A	06-30-19
Montana (UST)	State Program	8	NA	02-17-19
Nevada	State Program	9	TN00032	07-31-19
New Hampshire	NELAP	1	2963	10-09-19
New Jersey	NELAP	2	TN965	06-30-19
New York	NELAP	2	11342	03-31-20
North Carolina (WW/SW)	State Program	4	387	12-31-19
North Dakota	State Program	8	R-146	06-30-19
Ohio VAP	State Program	5	CL0033	07-06-19
Oklahoma	State Program	6	9412	08-31-19
Oregon	NELAP	10	TN200001	04-26-19
Pennsylvania	NELAP	3	68-00585	07-31-19
Rhode Island	State Program	1	LAO00268	12-30-19
South Carolina	State Program	4	84009 (001)	02-28-19 *
Tennessee	State Program	4	2008	02-23-20
Texas	NELAP	6	T104704077	08-31-19
USDA	Federal		P330-13-00306	04-10-20
Utah	NELAP	8	TN00032	07-31-19
Virginia	NELAP	3	460152	06-14-19
Washington	State Program	10	C789	07-19-19
West Virginia DEP	State Program	3	219	02-28-19 *
Wisconsin	State Program	5	998020430	08-31-19
Wyoming (UST)	A2LA	8	453.07	12-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181129_1B

Job ID: 490-164124-1

Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD / DOE		L2305	04-06-22
Arizona	State Program	9	AZ0813	12-08-19
California	State Program	9	2886	06-30-19 *
Connecticut	State Program	1	PH-0241	03-31-21
Florida	NELAP	4	E87689	06-30-19 *
Hawaii	State Program	9	NA	06-30-19
Illinois	NELAP	5	200023	11-30-19
Iowa	State Program	7	373	12-01-20
Kansas	NELAP	7	E-10236	10-31-19
Kentucky (DW)	State Program	4	KY90125	12-31-19
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA011	12-31-19
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-19
Missouri	State Program	7	780	06-30-19
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19 *
New York	NELAP	2	11616	03-31-20
North Dakota	State Program	8	R207	06-30-19 *
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-19
Pennsylvania	NELAP	3	68-00540	02-28-20
South Carolina	State Program	4	85002001	06-30-19
Texas	NELAP	6	T104704193-18-13	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542018-10	07-31-19
Virginia	NELAP	3	460230	06-14-19 *
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-164124 Chain of Custody

Cooler Received/Opened On 11/30/2018 @1510

Time Samples Removed From Cooler_____ Time Samples Placed In Storage_____ (2 Hour Window)

1. Tracking # N/A (last 4 digits, FedEx) Courier: Client

IR Gun ID 31470368 pH Strip Lot_____ Chlorine Strip Lot_____

2. Temperature of rep. sample or temp blank when opened: 4.5 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where:_____

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) EY

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # NA

I certify that I unloaded the cooler and answered questions 7-14 (intial) EY

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) EY

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) EY

I certify that I attached a label with the unique LIMS number to each container (intial) EY

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 8/23/17

TVA Environmental Investigations

Tennessee Valley Authority

Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

COOLER No.:	1 of 1
COC No:	CUF_BS_20181129_1B
1 of 1 Pages	
Task Desc:	CUF_BS

Required Ship to Lab:

Lab Name:	TestAmerica Nashville
Lab Address:	2960 Foster Creighton Drive Nashville, TN 37204

Lab Manager Contact Information

Lab PM:	Gail Lage
Phone/Fax:	615-301-5741/615-726-3404
Lab Email:	Gail.Lage@testamericainc.com

Required Project Information:

Site ID #:	CUMBERLAND FOSSIL PLANT		
Project #:	49014071		
Site Address	815 Cumberland City Road		
City	Cumberland City	State, Zip:	TN, 37763
Site PM Name:	Roy Quinn		
Phone/Fax:	423-751-3753		
Site PM Email:	jrquinn@tva.gov		

Required Sampler Information

Sampler:	Carolyn Sexton, Greg Budd		
Sampling Company:	Stantec		
Address	3502 Beaumont Centre Circle		
City/State	Lexington, KY	Phone:	859-422-3000
Sampling Team Number:	2		
Send EDD/Hard Copy to:	tva_deliverables@envstd.com		

Analysis Turnaround Time

☐ CALENDAR DAYS ☒ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours
☐ 3 Business Days
☒ 5 Business Days
☐ 10 Business Days (Standard)

Loc: 490
164124

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth: Start Depth (Depth Unit)	Sample Depth: End Depth (Select Unit)	MATRIX CODE	G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Filtered: N	Filtered: N	Preserve: None	Preserve: HNO3	Analysis: BACKGROUNDSOIL_RAD	Analysis: BACKGROUNDSOIL_BLANKS_RAD
1	CUF-BS-CUF1000ALTA-13.5/15.0-2001129	CUF1000ALTA	13.5	15	S	G	N	11/29/18	1350	2		☐					X	
2	CUF-BS-CUF1000ALTA-18.0/19.5-2001129	CUF1000ALTA	18	19.5	S	G	N	11/29/18	1426	2		☐					X	
3	CUF-BS-FB08-20181129	CUF1000ALTA	NA	NA	W	G	FB	11/29/18	1609	3		☐						X
4												☐						
5												☐						
6												☐						
7												☐						
8												☐						

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Carolyn Sexton	11/30/2018				

SHIPPING METHOD:	SAMPLER NAME AND SIGNATURE
Courier	

Sample Receipt Conditions

Temperature in °C	Sample on Ice?	Sample Intact?	Trip Blank?
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

Page 1 of 1

TA-NAS 11-30-2018 15:10 5.2, 3.0, 2.5, 4.5, 4.9, 5.5

Form TVA 3007A

TVA Environmental Investigations

Tennessee Valley Authority

Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

COOLER No.:	1	of	1
COC No:	CUF_BS_20181129_1B		
1 of 1 Pages			
Task Desc:	CUF_BS		

Rev-1 DC 12/19/18

Required Ship to Lab:

Lab Name:	TestAmerica Nashville
Lab Address:	2960 Foster Creighton Drive Nashville, TN 37204

Lab Manager Contact Information

Lab PM:	Gail Lage
Phone/Fax:	615-301-5741/615-726-3404
Lab Email:	Gail.Lage@testamericainc.com

Required Project Information:

Site ID #:	CUMBERLAND FOSSIL PLANT		
Project #:	49014071		
Site Address	815 Cumberland City Road		
City	Cumberland City	State, Zip:	TN, 37763
Site PM Name:	Roy Quinn		
Phone/Fax:	423-751-3753		
Site PM Email:	rquinn@tva.gov		

Required Sampler Information

Sampler:	Carolyn Sexton, Greg Budd		
Sampling Company:	Stantec		
Address	3502 Beaumont Centre Circle		
City/State	Lexington, KY	Phone:	859-422-3000
Sampling Team Number:	2		
Send EDD/Hard Copy to:	tva_deliverables@envstd.com		

Analysis Turnaround Time

- ☐ CALENDAR DAYS
- ☒ WORKING DAYS

TAT if different from Below _____

- ☐ 24 Hours
- ☐ 3 Business Days
- ☒ 5 Business Days
- ☐ 10 Business Days (Standard)

Loc: 490
164124

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth: Depth Unit	Sample Depth: Select Unit	MATRIX CODE	G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Analysis: BACKGROUNDSOIL_RAD (Filtered N)	Analysis: BACKGROUNDSOIL_BLANKS_RAD (Preserve HNO3, Filtered N)
1	CUF-BS-CUF1000ALTA-13.5/15.0-~~20181129~~ 20181129 DC 12/19/18	CUF1000ALTA	13.5	15	S	G	N	11/29/18	1350	2		☐	X	
2	CUF-BS-CUF1000ALTA-18.0/19.5-~~20181129~~	CUF1000ALTA	18	19.5	S	G	N	11/29/18	1426	2		☐	X	
3	CUF-BS-FB08-20181129	CUF1000ALTA	NA	NA	W	G	FB	11/29/18	1609	3		☐		X
4												☐		
5												☐		
6												☐		
7												☐		
8												☐		

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Carolyn Sexton	11/30/2018				

Sample Receipt Conditions

Temperature in °C	Sample on Ice?	Sample Intact?	Trip Blank?
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

SHIPPING METHOD:	SAMPLER NAME AND SIGNATURE
Courier	

Page 1 of 1 TH-NAS 11-30-2018 15:10 5.2, 3.0, 2.5, 4.5, 4.9, 5.5

Form TVA 3006ZA

TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Phone (615) 726-0177 Fax (615) 726-3404

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lage, Gail	Carrier Tracking No(s):	COC No: 490-83133.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: gail.lage@testamericainc.com	State of Origin: Tennessee	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 490-164124-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 1/3/2019			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: CUF_BS_20181129_1B	Project #: 49014071			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	901.1_Ra/Fill_Geo_21 (MOD) Radium-226/228	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
CUF-BS-CUF1000ALTA-13.5/15.0-2001129 (490-164124-1)	11/29/18	13:50 Central		Solid			X	2	TVA
CUF-BS-CUF1000ALTA-18.0/19.5-2001129 (490-164124-2)	11/29/18	14:26 Central		Solid			X	2	TVA
CUF-BS-FB08-20181129 (490-164124-3)	11/29/18	16:09 Central		Water			X	2	TVA

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: [signature]	Date/Time: 12.3.18@1555	Company TAMAS	Received by: Michael Heem	Date/Time: 12/05/18 1000	Company TASL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: Environmental Standards Inc.

Job Number: 490-164124-1

Login Number: 164124
List Number: 2
Creator: Hellm, Michael

List Source: Eurofins TestAmerica, St. Louis
List Creation: 12/05/18 03:33 PM

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	17.0
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?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
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.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Environmental Standards Inc.

Job Number: 490-164124-1

Login Number: 164124
List Number: 3
Creator: Hellm, Michael

List Source: Eurofins TestAmerica, St. Louis
List Creation: 12/05/18 03:41 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	17.0
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?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	