

**Data Validation Report  
Tennessee Valley Authority  
Cumberland Fossil Plant  
Environmental Investigation Plan  
Background Soil Samples**

This quality assurance (QA) review is based upon an examination of the data generated from the analyses of the five background soil samples and one aqueous blank collected on August 24, 2018, at the Tennessee Valley Authority (TVA) Cumberland Fossil Plant facility. These samples were collectively analyzed by TestAmerica Laboratories, Inc. (TestAmerica), of Pittsburgh, Pennsylvania, for total metals by SW-846 Method 6020A. In addition, these samples were collectively analyzed by TestAmerica, of Nashville, Tennessee, for total mercury by SW-846 Methods 7470A/7471B; for anions (specifically, chloride, fluoride, and sulfate) by SW-846 Method 9056A; and for pH by SW-846 Method 9045D.

This review was performed in accordance with the Environmental Investigation Plan for the Tennessee Valley Authority Cumberland Fossil Plant Environmental Investigation (CUF EIP; Revision 3 Final, June 2018). This review was performed with guidance from the National Functional Guidelines for Inorganic Data Review (US EPA, October 2004); the US EPA Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (November 2001); and the US EPA Region IV Data Validation Standard Operating Procedures. These validation guidance documents specifically address analyses performed in accordance with the Contract Laboratory Program (CLP) analytical methods and are not completely applicable to the type of analyses and analytical protocols performed for the SW-846 Methods utilized by the laboratory for these samples. Environmental Standards, Inc. (Environmental Standards) used professional judgment to determine the usability of the analytical results and compliance relative to the SW-846 Methods utilized by the laboratory.

### **Summary**

The analytical results and associated laboratory quality control (QC) samples were reviewed to determine the integrity of the reported analytical results and to ensure that the data met the established data quality objectives. This QA review includes all samples in TestAmerica Job Numbers 490-158029-1 and 490-158029-2.

The samples that have undergone Stage 4 data validation are listed below:

Sample Identification	Laboratory Sample Identification	Job Number	Matrix	Date Sample Collected	Parameter(s) Examined
CUF-BS-FB04-20180824 (Field Blank)	490-158029-1 490-158029-2	490-158029-1 490-158029-2	Aq	8/24/18	A, Hg M
CUF-BS-BGG08-0.0/0.5-20180824	490-158029-2	490-158029-1 490-158029-2	Aq	8/24/18	A, Hg, pH M
CUF-BS-BG08-0.9/2.9-20180824	490-158029-3	490-158029-1 490-158029-2	Aq	8/24/18	A, Hg, pH M
CUF-BS-BG08-6.5/8.5-20180824	490-158029-4	490-158029-1 490-158029-2	Aq	8/24/18	A, Hg, pH M
CUF-BS-FD01-20180824 (Field Duplicate of CUF-BS-BG08-0.9/2.9-20180824)	490-158029-5	490-158029-1 490-158029-2	Aq	8/24/18	A, Hg, pH M
CUF-BS-BG08-10.0/12.0-20180824	490-158029-6	490-158029-1 490-158029-2	Aq	8/24/18	A, Hg, pH M

#### Parameters Examined

- M - Total Metals by SW-846 Method 6020A.  
Hg - Mercury by SW-846 Methods 7470A/7471B.  
A - Anions (specifically, chloride, fluoride, and sulfate) by SW-846 Method 9056A.  
pH - pH by SW-846 Method 9045D.  
Aq - Aqueous.

Items Reviewed	
Holding Times	Instrument Tuning and Calibrations
Sample Preservation	Reporting Limit (RL) Standard Recoveries
Chain-of-Custody (COC) Record and Case Narrative	Internal Standard Recoveries
Blank Results	Serial Dilution Analysis
Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results	Post-Digestion Spike Results
Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Results	Sample Preparation
Field Duplicate Results	Analytical Sequence
Quantitation of Positive Results	

### Comments and Exceptions

- All analyses performed for the sampling event were in compliance with the requirements set forth in the CUF EIP.
- Due to quality control noncompliance identified during data validation, all background soil samples included in this Job Number were reanalyzed for ICP/MS metals at TestAmerica of Pittsburgh, Pennsylvania. Upon further review of the data, TestAmerica rescinded all of the background soil ICP/MS data originally reported from TestAmerica of Nashville, Tennessee. The ICP/MS metals results for these samples were re-reported from the re-analyses performed at TestAmerica of Pittsburgh, Pennsylvania. (see Project Correspondence [Section 5]).

### Qualifier Summary

Analyte(s)	Job Number	Sample(s)	Validation Qualifier(s)	Reason(s) for Qualification
sulfate	490-158029-1	CUF-BS-BG08-0.9/2.9-20180824, CUF-BS-BG08-6.5/8.5-20180824, CUF-BS-FD01-20180824, and CUF-BS-BG08-10.0/12.0-20180824	U*	BE, BF, BL
sulfate	490-158029-1	CUF-BS-BG08-0.0/0.5-20180824	U*	BL
chloride	490-158029-1	CUF-BS-BG08-0.0/0.5-20180824	U*	BE
antimony, selenium, and vanadium	490-158029-2	All samples except CUF-BS-FB04-20180824	J	M-
lithium	490-158029-2	All samples except CUF-BS-FB04-20180824	J	M+

Analyte(s)	Job Number	Sample(s)	Validation Qualifier(s)	Reason(s) for Qualification
calcium, chromium, cobalt, copper, nickel, vanadium, and zinc	490-158029-2	CUF-BS-FD01-20180824	J	I

All positive results reported between the MDL and QL should be considered estimated and have been flagged "J" (unless previously flagged "U\*") on the data tables. (Reason Code: RL)

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Review performed by: Allison M. Felix, Quality Assurance Chemist

Report reviewed and approved by: Andrew L. Piasecki, Senior Quality Assurance Chemist

Review approved by: Rock J. Vitale, CEAC, Technical Director of Chemistry/Principal

Date review completed: 2/26/19

**SECTION 2**

**ANALYTICAL RESULTS**

## **INORGANIC DATA QUALIFIERS**

- U\* This result should be considered "not-detected" because it was detected in a rinsate blank or laboratory blank at a similar level.
- UR Unreliable reporting limit; analyte may or may not be present in sample.
- R Unreliable positive result; analyte may or may not be present in sample.
- J Quantitation is approximate due to limitations identified during data validation.
- UJ This analyte was not detected, but the reporting limit may or may not be higher due to a bias identified during data validation.



## **REASON CODES AND EXPLANATIONS**

<b>Reason Code</b>	<b>Explanation</b>
BE	Equipment blank contamination. The result should be considered "not-detected."
BF	Field blank contamination. The result should be considered "not-detected."
BL	Laboratory blank contamination. The result should be considered "not-detected."
BN	Negative laboratory blank contamination.
C	Initial and/or Continuing Calibration issue, indeterminate bias.
C+	Initial and/or Continuing Calibration issue. The result may be biased high.
C-	Initial and/or Continuing Calibration issue. The result may be biased low.
FD	Field duplicate imprecision.
FG	Total versus Dissolved Imprecision.
H	Holding time exceeded.
I	Internal standard recovery outside of acceptance limits.
L	LCS and LCSD recoveries outside of acceptance limits, indeterminate bias.
L+	LCS and/or LCSD recoveries outside of acceptance limits. The result may be biased high.
L-	LCS and/or LCSD recoveries outside of acceptance limits. The result may be biased low.
LD	Laboratory duplicate imprecision.
LP	LCS/LCSD imprecision.
M	MS and MSD recoveries outside of acceptance limits, indeterminate bias.
M+	MS and/or MSD recoveries outside of acceptance limits. The result may be biased high.
M-	MS and/or MSD recoveries outside of acceptance limits. The result may be biased low.
MP	MS/MSD imprecision.
P	Post-digestion spike recoveries outside of acceptance limits, indeterminate bias.
P+	Post-digestion spike recovery outside of acceptance limits. The result may be biased high.
P-	Post-digestion spike recovery outside of acceptance limits. The result may be biased low.
Q	Chemical Preservation issue.
R	RL standards outside of acceptance limits, indeterminate bias.
R+	RL standard(s) outside of acceptance limits. The result may be biased high.
R-	RL standard(s) outside of acceptance limits. The result may be biased low.
RL	Reported result between the MDL and the QL.
T	Temperature preservation issue.
SD	Serial Dilution imprecision.
X	Percent solids < 50%.
Y+	Chemical Yield outside of acceptance limits. The result may be biased high.
Y-	Chemical yield outside of acceptance limits. The result may be biased low.
Z	ICP or ICP/MS Interference.
ZZ	Other.

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
SW-846 6020A	Antimony	7440-36-0	T	MG/L		U		0.00112	0.00112	0.00200	N	Yes	1	NA
	Arsenic	7440-38-2	T	MG/L		U		0.000323	0.000323	0.00100	N	Yes	1	NA
	Barium	7440-39-3	T	MG/L		U		0.000373	0.000373	0.0100	N	Yes	1	NA
	Beryllium	7440-41-7	T	MG/L		U		0.0000570	0.0000570	0.00100	N	Yes	1	NA
	Boron	7440-42-8	T	MG/L		U		0.0303	0.0303	0.0800	N	Yes	1	NA
	Cadmium	7440-43-9	T	MG/L		U		0.000125	0.000125	0.00100	N	Yes	1	NA
	Calcium	7440-70-2	T	MG/L		U		0.116	0.116	0.500	N	Yes	1	NA
	Chromium	7440-47-3	T	MG/L	0.00130	J	RL	0.000631	0.000631	0.00200	Y	Yes	1	NA
	Cobalt	7440-48-4	T	MG/L		U		0.0000750	0.0000750	0.000500	N	Yes	1	NA
	Copper	7440-50-8	T	MG/L		U		0.00130	0.00130	0.00200	N	Yes	1	NA
	Lead	7439-92-1	T	MG/L		U		0.0000940	0.0000940	0.00100	N	Yes	1	NA
	Lithium	7439-93-2	T	MG/L		U		0.00256	0.00256	0.00500	N	Yes	1	NA
	Molybdenum	7439-98-7	T	MG/L		U		0.000474	0.000474	0.00500	N	Yes	1	NA
	Nickel	7440-02-0	T	MG/L		U		0.000312	0.000312	0.00100	N	Yes	1	NA
	Selenium	7782-49-2	T	MG/L		U		0.000813	0.000813	0.00500	N	Yes	1	NA
	Silver	7440-22-4	T	MG/L		U		0.000121	0.000121	0.00100	N	Yes	1	NA
	Thallium	7440-28-0	T	MG/L		U		0.0000630	0.0000630	0.00100	N	Yes	1	NA
	Vanadium	7440-62-2	T	MG/L		U		0.000899	0.000899	0.00100	N	Yes	1	NA
	Zinc	7440-66-6	T	MG/L		U		0.00242	0.00242	0.00500	N	Yes	1	NA
SW-846 7470A	Mercury	7439-97-6	T	MG/L		U		0.000100	0.000100	0.000200	N	Yes	1	NA
SW-846 9056A	Chloride	16887-00-6	N	MG/L		U		0.200	0.200	1.00	N	Yes	1	NA
	Fluoride	16984-48-8	N	MG/L		U		0.0100	0.0100	0.100	N	Yes	1	NA
	Sulfate	14808-79-8	N	MG/L	0.343	J	RL	0.0300	0.0300	1.00	Y	Yes	1	NA

				<b>Lab Sample ID</b>	490-158029-2									
				<b>Sys Sample Code</b>	CUF-BS-BG08-0.0/0.5-20180824									
				<b>Sample Name</b>	CUF-BS-BG08-0.0/0.5-20180824									
				<b>Sample Date</b>	8/24/2018 9:26:00 AM									
				<b>Location</b>	BG-08									
				<b>Sample Type</b>	N									
				<b>Parent Sample</b>										
Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
	Percent Moisture:			%	18.5									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.247	J	M-	0.0732	0.0732	0.236	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	5.75			0.0307	0.0307	0.118	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	75.9			0.0673	0.0673	1.18	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.680			0.00885	0.00885	0.118	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	2.13	J	RL	0.901	0.901	9.44	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.199			0.0201	0.0201	0.118	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	2610			10.6	10.6	59.0	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	18.9			0.0779	0.0779	0.236	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	9.91			0.00980	0.00980	0.0590	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	8.71			0.133	0.133	0.236	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	16.5			0.0413	0.0413	0.118	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	4.74	J	M+	0.326	0.326	0.590	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	0.499	J	RL	0.0732	0.0732	0.590	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	11.5			0.0720	0.0720	0.118	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.348	J	M-,RL	0.0708	0.0708	0.590	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0417	J	RL	0.0165	0.0165	0.118	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.132			0.0153	0.0153	0.118	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	30.3	J	M-	0.0720	0.0720	0.118	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	32.4			0.394	0.394	0.590	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG		U		0.0363	0.0363	0.121	N	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	7.4			0.1	0.1	0.1	Y	Yes	1	WET
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U*	BE	17.6	17.6	17.6	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG	1.93			0.973	0.973	1.22	Y	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG		U*	BL	27.9	27.9	27.9	N	Yes	1	DRY

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
	Percent Moisture:			%	19.5									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.183	J	M-,RL	0.0755	0.0755	0.244	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	5.22			0.0317	0.0317	0.122	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	100			0.0694	0.0694	1.22	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.789			0.00913	0.00913	0.122	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	2.40	J	RL	0.929	0.929	9.74	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.201			0.0207	0.0207	0.122	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	1740			10.9	10.9	60.9	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	17.7			0.0804	0.0804	0.244	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	9.93			0.0101	0.0101	0.0609	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	9.61			0.138	0.138	0.244	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	12.2			0.0426	0.0426	0.122	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	7.56	J	M+	0.336	0.336	0.609	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	0.561	J	RL	0.0755	0.0755	0.609	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	11.8			0.0743	0.0743	0.122	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.367	J	M-,RL	0.0731	0.0731	0.609	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0521	J	RL	0.0170	0.0170	0.122	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.159			0.0158	0.0158	0.122	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	30.8	J	M-	0.0743	0.0743	0.122	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	32.2			0.407	0.407	0.609	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG		U		0.0359	0.0359	0.120	N	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	7.7			0.1	0.1	0.1	Y	Yes	1	WET
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		8.69	8.69	12.4	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG	2.40			0.993	0.993	1.24	Y	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG		U*	BE,BF,BL,RL	11.1	11.1	12.4	N	Yes	1	DRY

				<b>Lab Sample ID</b>	490-158029-4									
				<b>Sys Sample Code</b>	CUF-BS-BG08-6.5/8.5-20180824									
				<b>Sample Name</b>	CUF-BS-BG08-6.5/8.5-20180824									
				<b>Sample Date</b>	8/24/2018 10:22:00 AM									
				<b>Location</b>	BG-08									
				<b>Sample Type</b>	N									
				<b>Parent Sample</b>										
Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
	Percent Moisture:			%	16.8									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.358	J	M-	0.0738	0.0738	0.238	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	13.5			0.0309	0.0309	0.119	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	191			0.0678	0.0678	1.19	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	1.17			0.00893	0.00893	0.119	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	2.85	J	RL	0.908	0.908	9.52	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.952			0.0202	0.0202	0.119	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	2270			10.7	10.7	59.5	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	25.5			0.0786	0.0786	0.238	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	23.0			0.00988	0.00988	0.0595	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	15.7			0.134	0.134	0.238	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	20.4			0.0417	0.0417	0.119	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	26.9	J	M+	0.328	0.328	0.595	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	1.08			0.0738	0.0738	0.595	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	26.8			0.0726	0.0726	0.119	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.281	J	M-,RL	0.0714	0.0714	0.595	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0806	J	RL	0.0167	0.0167	0.119	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.238			0.0155	0.0155	0.119	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	55.2	J	M-	0.0726	0.0726	0.119	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	72.1			0.398	0.398	0.595	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG		U		0.0349	0.0349	0.116	N	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	7.6			0.1	0.1	0.1	Y	Yes	1	WET
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		8.35	8.35	11.9	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG	2.30			0.955	0.955	1.19	Y	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG		U*	BE,BF,BL	12.5	12.5	12.5	N	Yes	1	DRY

<b>Lab Sample ID</b>	490-158029-5
<b>Sys Sample Code</b>	CUF-BS-FD01-20180824
<b>Sample Name</b>	CUF-BS-FD01-20180824
<b>Sample Date</b>	8/24/2018 12:00:00 AM
<b>Location</b>	BG-08
<b>Sample Type</b>	FD
<b>Parent Sample</b>	CUF-BS-BG08-0.9/2.9-20180824

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
	Percent Moisture:			%	19.7									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.225	J	M-,RL	0.0735	0.0735	0.237	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	5.69			0.0308	0.0308	0.119	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	107			0.0676	0.0676	1.19	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.847			0.00889	0.00889	0.119	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	2.50	J	RL	0.905	0.905	9.49	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.256			0.0202	0.0202	0.119	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	2090	J	I	10.6	10.6	59.3	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	20.2	J	I	0.0783	0.0783	0.237	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	10.5	J	I	0.00984	0.00984	0.0593	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	10.3	J	I	0.134	0.134	0.237	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	14.4			0.0415	0.0415	0.119	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	9.07	J	M+	0.327	0.327	0.593	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	0.592	J	RL	0.0735	0.0735	0.593	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	13.5	J	I	0.0723	0.0723	0.119	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.439	J	M-,RL	0.0712	0.0712	0.593	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0633	J	RL	0.0166	0.0166	0.119	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.156			0.0154	0.0154	0.119	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	34.0	J	I,M-	0.0723	0.0723	0.119	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	36.6	J	I	0.396	0.396	0.593	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG		U		0.0373	0.0373	0.124	N	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	7.6			0.1	0.1	0.1	Y	Yes	1	WET
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		8.58	8.58	12.3	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG	2.20			0.981	0.981	1.23	Y	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG		U*	BE,BF,BL	12.9	12.9	12.9	N	Yes	1	DRY

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
	Percent Moisture:			%	21.2									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.258	J	M-	0.0757	0.0757	0.244	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	11.4			0.0317	0.0317	0.122	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	144			0.0696	0.0696	1.22	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	1.03			0.00915	0.00915	0.122	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	3.13	J	RL	0.931	0.931	9.76	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	1.01			0.0207	0.0207	0.122	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	3000			10.9	10.9	61.0	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	26.6			0.0805	0.0805	0.244	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	16.1			0.0101	0.0101	0.0610	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	23.4			0.138	0.138	0.244	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	17.5			0.0427	0.0427	0.122	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	31.0	J	M+	0.337	0.337	0.610	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	1.13			0.0757	0.0757	0.610	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	34.3			0.0744	0.0744	0.122	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.251	J	M-,RL	0.0732	0.0732	0.610	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0996	J	RL	0.0171	0.0171	0.122	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.294			0.0159	0.0159	0.122	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	41.4	J	M-	0.0744	0.0744	0.122	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	87.2			0.408	0.408	0.610	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG	0.0391	J	RL	0.0371	0.0371	0.124	Y	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	7.6			0.1	0.1	0.1	Y	Yes	1	WET
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		8.99	8.99	12.8	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG	2.55			1.03	1.03	1.28	Y	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG		U*	BE,BF,BL	15.3	15.3	15.3	N	Yes	1	DRY

## **SECTION 3**

### **SUPPORTING DOCUMENTATION FOR QUALIFIERS**



## INORGANIC ANALYSIS SUPPORT DOCUMENTATION

ESI project name: TVA CUF  
 Sample Collection Dates: 8/24/18  
 Job Number: 20188111.A  
 Project Manager: Andrew Piasecki  
 Laboratory: TestAmerica Pittsburgh,  
 Nashville

Reviewed by: Allison Felix  
 Approved by:  
 Completion Date: AP  
 2/2019

Applicable Sample No's (X)

Refer to Table 1 in the Quality Assurance Review

		<u>Sample No.</u>	<u>Lab Control No.</u>
Deliverable:	CLP (Full) ( )		
Level IV (Full)	( X )	All	490-158029-1
Limited	( )		
Other:			

The following table indicates criteria that were examined, the identified problems, and support documentation attachments

	Criteria Examined in Detail				Problems Identified				Support Documentation Attachments					
	Check (✓) if Yes or Footnote Letter for Comments Below				Check (✓) if Yes or Footnote Letter for Comments Below				Check (✓) if Yes or Footnote Letter for Comments Below					
	6020A	7470A	300.0	9040		6020A	7470A	300.0	9040		6020A	7470A	300.0	9040
Holding Times	X	X	X	X							X	X	X	X
Blank Analysis Results	X	X	X	X		X		X			X	X	X	X
Matrix Spike (Predigestion) Results	X					X								
Duplicate Analysis: ( X ) Field () Lab	X	X	X	X							X	X	X	X
Quantification of Results	X	X	X	X							X	X	X	X
Detection Limit/Sensitivity	X	X	X	X							X	X	X	X
Initial Calibrations	X	X	X								X	X	X	
Continuing Calibrations	X	X	X	X							X	X	X	X
Laboratory Control Standard (LCS)	X	X	X	X							X	X	X	X
ICP Linear Range Analysis														
ICP Interference Checks														
ICP Serial Dilutions	X										X			
ICP Post-Digestion Spike														
GFAA Post Digestion Spikes														
GFAA Duplicate Injections														
ICP Multiple Exposures														
GFAA Standard Additions														
CRDL Standards	X	X	X								X	X	X	
Condition on Receipt	X	X	X	X							X	X	X	X
Percent Solids														
Others: ICP-MS Tune and IS	X					X					X			

Comments:

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## BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

	Blank Type									
	Method		Prep.	Trip	Equip	Field				
Matrix (Aq., S.)	ICB	CCB					Blank Sample Number	Contaminant	Concentration (mg/kg or mg/L)	Qualification limit (5x)
Aq		X					MB 490-538847/3 IC	SO4	0.3353	1.6765
S		X					MB 490-540377/1-A IC	None present		0
Aq		X					MB 490-53912/1-A Hg	None present		0
Aq		X					MB 490-541009/1-A Hg	None present		0
Aq		X					MB 490-541313/1-A Hg	None present		0
Aq				X			CUF-BS-EB01-20180823	Cl	0.27	1.35
Aq				X			CUF-BS-EB01-20180823	SO4	0.434	2.17
Aq				X			CUF-BS-EB02-20180827	Cl	0.303	1.515
Aq				X			CUF-BS-EB02-20180827	SO4	0.436	2.18
Aq				X			CUF-BS-FB04-20180824	SO4	0.343	1.715
Aq	X						IC CCB	SO4	0.3397	1.6985
S	X						IC CCB	Cl	0.2374	1.187
S	X						IC CCB	SO4	0.4603	2.3015
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Aq = Aqueous; S = Solid

Notes: Aqueous MB associated with FB analysis only, results of MB not applied to FB.  
See Blank Qual worksheet for evaluation of EB, FB, and ICB/CCBs.

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## BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

Matrix (Aq., S.)	Blank Type						Contaminant	Concentration (mg/kg or mg/L)	Qualification limit (5x)		
	Method	ICB	CCB	Prep.	Trip	Equip	Field				
S			X					MB 490-264947/1-A	Ni	0.0691	0.3455
S			X					MB 490-264947/1-A	Zn	0.3496	1.748
S		X						ICP-MS ICB/CCB	Ba	0.00087	0.00435
S		X						ICP-MS ICB/CCB	Pb	0.000146	0.00073
S		X						ICP-MS ICB/CCB	Mo	0.000959	0.004795
S		X						ICP-MS ICB/CCB	Ni	0.000968	0.00484
Aq				X				CUF-BS-EB01-20180823	Ca	0.147	0.735
Aq				X				CUF-BS-EB01-20180823	Cr	0.00122	0.0061
Aq				X				CUF-BS-EB02-20180827	Ca	0.13	0.65
Aq				X				CUF-BS-EB02-20180827	Cr	0.00164	0.0082
Aq				X				CUF-BS-EB02-20180827	V	0.000981	0.004905
Aq				X				CUF-BS-FB04-20180824	Cr	0.0013	0.0065
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Aq = Aqueous; S = Solid

Notes:      Aqueous MB associated with FB analysis only, results of MB not applied to FB.  
See Blank Qual worksheet for evaluation of EB, FB, and ICB/CCBs.

## Client Sample Results

Client: Environmental Standards Inc.  
Project/Site: CUF\_BS\_20180823\_1A

TestAmerica Job ID: 490-157991-1

**Client Sample ID: CUF-BS-EB01-20180823**

**Lab Sample ID: 490-157991-6**

**Matrix: Water**

Date Collected: 08/23/18 11:13

Date Received: 08/23/18 19:54

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**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.270	J B	1.00	0.200	mg/L			08/24/18 17:02	1
Fluoride	ND		0.100	0.0100	mg/L			08/24/18 17:02	1
Sulfate	0.434	J B	1.00	0.0300	mg/L			08/24/18 17:02	1

**Method: 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.000100	mg/L		08/29/18 14:16	08/31/18 21:40	1

**Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.00200	0.00112	mg/L		12/07/18 13:06	12/08/18 10:59	1
Arsenic	ND		0.00100	0.000323	mg/L		12/07/18 13:06	12/08/18 10:59	1
Barium	ND		0.0100	0.000373	mg/L		12/07/18 13:06	12/08/18 10:59	1
Beryllium	ND		0.00100	0.0000570	mg/L		12/07/18 13:06	12/08/18 10:59	1
Boron	ND		0.0800	0.0303	mg/L		12/07/18 13:06	12/08/18 10:59	1
Cadmium	ND		0.00100	0.000125	mg/L		12/07/18 13:06	12/08/18 10:59	1
Calcium	0.147	J	0.500	0.116	mg/L		12/07/18 13:06	12/08/18 10:59	1
Chromium	0.00122	J	0.00200	0.000631	mg/L		12/07/18 13:06	12/08/18 10:59	1
Cobalt	ND		0.000500	0.0000750	mg/L		12/07/18 13:06	12/08/18 10:59	1
Copper	ND		0.00200	0.00130	mg/L		12/07/18 13:06	12/08/18 10:59	1
Lead	ND		0.00100	0.0000940	mg/L		12/07/18 13:06	12/08/18 10:59	1
Lithium	ND		0.00500	0.00256	mg/L		12/07/18 13:06	12/08/18 10:59	1
Molybdenum	ND		0.00500	0.000474	mg/L		12/07/18 13:06	12/08/18 10:59	1
Nickel	ND		0.00100	0.000312	mg/L		12/07/18 13:06	12/08/18 10:59	1
Selenium	ND		0.00500	0.000813	mg/L		12/07/18 13:06	12/08/18 10:59	1
Silver	ND		0.00100	0.000121	mg/L		12/07/18 13:06	12/08/18 10:59	1
Thallium	ND		0.00100	0.0000630	mg/L		12/07/18 13:06	12/08/18 10:59	1
Vanadium	ND		0.00100	0.000899	mg/L		12/07/18 13:06	12/08/18 10:59	1
Zinc	ND		0.00500	0.00242	mg/L		12/07/18 13:06	12/08/18 10:59	1

Qualify Cl U\*, BE in BG08-0.0/0.5. All other ND. No impact.

Qualify SO4 in BG08-0.9/2.9, BG08-6.5/8.5, FD01, and BG08-10.0/12.0 U\*, BE.

All metals sample results were >>5x EBs, no impact.

TestAmerica Nashville

## Client Sample Results

Client: Environmental Standards Inc.  
Project/Site: CUF\_BS\_20180827\_1A

TestAmerica Job ID: 490-158137-1

**Client Sample ID: CUF-BS-EB02-20180827**

**Lab Sample ID: 490-158137-8**

**Matrix: Water**

Date Collected: 08/27/18 15:55

Date Received: 08/27/18 19:00

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**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.303	J B	1.00	0.200	mg/L			08/29/18 17:26	1
Fluoride	ND		0.100	0.0100	mg/L			08/29/18 17:26	1
Sulfate	0.436	J B	1.00	0.0300	mg/L			08/29/18 17:26	1

**Method: 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.000100	mg/L		08/29/18 14:15	08/31/18 21:21	1

**Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.00200	0.00112	mg/L		12/07/18 13:06	12/08/18 11:16	1
Arsenic	ND		0.00100	0.000323	mg/L		12/07/18 13:06	12/08/18 11:16	1
Barium	ND		0.0100	0.000373	mg/L		12/07/18 13:06	12/08/18 11:16	1
Beryllium	ND		0.00100	0.0000570	mg/L		12/07/18 13:06	12/08/18 11:16	1
Boron	ND		0.0800	0.0303	mg/L		12/07/18 13:06	12/08/18 11:16	1
Cadmium	ND		0.00100	0.000125	mg/L		12/07/18 13:06	12/08/18 11:16	1
Calcium	0.130	J	0.500	0.116	mg/L		12/07/18 13:06	12/08/18 11:16	1
Chromium	0.00164	J	0.00200	0.000631	mg/L		12/07/18 13:06	12/08/18 11:16	1
Cobalt	ND		0.000500	0.0000750	mg/L		12/07/18 13:06	12/08/18 11:16	1
Copper	ND		0.00200	0.00130	mg/L		12/07/18 13:06	12/08/18 11:16	1
Lead	ND		0.00100	0.0000940	mg/L		12/07/18 13:06	12/08/18 11:16	1
Lithium	ND		0.00500	0.00256	mg/L		12/07/18 13:06	12/08/18 11:16	1
Molybdenum	ND		0.00500	0.000474	mg/L		12/07/18 13:06	12/08/18 11:16	1
Nickel	ND		0.00100	0.000312	mg/L		12/07/18 13:06	12/08/18 11:16	1
Selenium	ND		0.00500	0.000813	mg/L		12/07/18 13:06	12/08/18 11:16	1
Silver	ND		0.00100	0.000121	mg/L		12/07/18 13:06	12/08/18 11:16	1
Thallium	ND		0.00100	0.0000630	mg/L		12/07/18 13:06	12/08/18 11:16	1
Vanadium	0.000981	I	0.00100	0.000899	mg/L		12/07/18 13:06	12/08/18 11:16	1
Zinc	ND		0.00500	0.00242	mg/L		12/07/18 13:06	12/08/18 11:16	1

TestAmerica Nashville

FORM I  
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Nashville Job No.: 490-158029-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: CCB 490-540592/3  
 Matrix: Solid Lab File ID: 090418IC9\_008dat-Conductivity.  
 Analysis Method: 9056A Date Collected: \_\_\_\_\_  
 Extraction Method: \_\_\_\_\_ Date Extracted: \_\_\_\_\_  
 Sample wt/vol: 10 (mL) Date Analyzed: 09/04/2018 10:00  
 Con. Extract Vol.: \_\_\_\_\_ Dilution Factor: 1  
 Injection Volume: 1 (uL) GC Column: Metrohm ASupp4 ID: 4 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 540592 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
16887-00-6	Chloride	0.2334	J	1.00	0.200
16984-48-8	Fluoride	ND		0.100	0.0100
14808-79-8	Sulfate	0.4603	J	1.00	0.0300

Associated with soils.  
 Highest blank result applied to samples.  
 All Cl sample results either >5x or ND. No impact.  
 Qualify all SO4 results U\*,BL.

FORM I  
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Nashville	Job No.: 490-158029-1
SDG No.:	
Client Sample ID:	Lab Sample ID: CCB 490-540592/20
Matrix: Solid	Lab File ID: 090418IC9_025dat-Conductivity.
Analysis Method: 9056A	Date Collected:
Extraction Method:	Date Extracted:
Sample wt/vol: 10 (mL)	Date Analyzed: 09/04/2018 13:17
Con. Extract Vol.:	Dilution Factor: 1
Injection Volume: 1 (uL)	GC Column: Metrohm ASupp4 ID: 4 (mm)
% Moisture:	GPC Cleanup: (Y/N) N
Analysis Batch No.: 540592	Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
16887-00-6	Chloride	0.2374	J	1.00	0.200
16984-48-8	Fluoride	ND		0.100	0.0100
14808-79-8	Sulfate	0.4545	J	1.00	0.0300

FORM I  
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Nashville \_\_\_\_\_ Job No.: 490-158029-1 \_\_\_\_\_  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: CCB 490-540592/32 \_\_\_\_\_  
 Matrix: Solid \_\_\_\_\_ Lab File ID: 090418IC9\_037dat-Conductivity.  
 Analysis Method: 9056A \_\_\_\_\_ Date Collected: \_\_\_\_\_  
 Extraction Method: \_\_\_\_\_ Date Extracted: \_\_\_\_\_  
 Sample wt/vol: 10 (mL) \_\_\_\_\_ Date Analyzed: 09/04/2018 15:37 \_\_\_\_\_  
 Con. Extract Vol.: \_\_\_\_\_ Dilution Factor: 1 \_\_\_\_\_  
 Injection Volume: 1 (uL) \_\_\_\_\_ GC Column: Metrohm ASupp4 ID: 4 (mm) \_\_\_\_\_  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N \_\_\_\_\_  
 Analysis Batch No.: 540592 Units: mg/L \_\_\_\_\_

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
16887-00-6	Chloride	0.2136	J	1.00	0.200
16984-48-8	Fluoride	ND		0.100	0.0100
14808-79-8	Sulfate	0.4558	J	1.00	0.0300

## HPLC/IC ANALYSIS RUN LOG

Lab Name: TestAmerica Nashville

Job No.: 490-158029-1

SDG No.:

Instrument ID: IC10

Start Date: 08/17/2018 11:11

Analysis Batch Number: 536885

End Date: 08/17/2018 13:40

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STO1 490-536885/1.d		08/17/2018 11:11	1	C:\2_RT\STO1\Anio ns\ (AUTO)_20180817-122600.d	Metrohm ASupp4 4 (mm)
STO2 490-536885/2.d		08/17/2018 11:11	1	ICR1_BUF2335_Anio ns\ (AUTO)_20180817-122600.d	Metrohm ASupp4 4 (mm)
S203 490-536885/3.d		08/17/2018 11:11	1	ICR1_BUF2335_Anio ns\ (AUTO)_20180817-122600.d	Metrohm ASupp4 4 (mm)
ICRT 490-536885/4.d		08/17/2018 11:11	1	ICR1_BUF2335_Anio ns\ (AUTO)_20180817-122600.d	Metrohm ASupp4 4 (mm)
ICRT 490-536885/5.d		08/17/2018 11:11	1	ICR1_BUF2335_Anio ns\ (AUTO)_20180817-122600.d	Metrohm ASupp4 4 (mm)
ICRT 490-536885/6		08/17/2018 12:26	1	ICR1_BUF2335_Anio ns\ (AUTO)_20180817-122600.d	Metrohm ASupp4 4 (mm)
ICRT 490-536885/7.d		08/17/2018 12:26	1	ICR1_BUF2335_Anio ns\ (AUTO)_20180817-122600.d	Metrohm ASupp4 4 (mm)
ICRT 490-536885/8.d		08/17/2018 12:26	1	ICR1_BUF2335_Anio ns\ (AUTO)_20180817-122600.d	Metrohm ASupp4 4 (mm)
ICRT 490-536885/9.d		08/17/2018 12:26	1	ICR1_BUF2335_Anio ns\ (AUTO)_20180817-122600.d	Metrohm ASupp4 4 (mm)
ICB 490-536885/10		08/17/2018 13:15	1	ICR1_BUF2335_Anio ns\ (AUTO)_20180817-134017.d	Metrohm ASupp4 4 (mm)
ICB 490-536885/11		08/17/2018 13:40	1	ICR1_BUF2335_Anio ns\ (AUTO)_20180817-134017.d	Metrohm ASupp4 4 (mm)

## HPLC/IC ANALYSIS RUN LOG

Lab Name: TestAmerica Nashville Job No.: 490-158029-1  
SDG No.:  
Instrument ID: IC10 Start Date: 08/27/2018 10:29  
Analysis Batch Number: 538847 End Date: 08/27/2018 17:10

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CVRT 490-538847/1	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Metrohm ASupp4 4 (mm)
CVR 490-538847/2	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Metrohm ASupp4 4 (mm)
AB 490-538847/3	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Metrohm ASupp4 4 (mm)
AB 490-538847/4	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Metrohm ASupp4 4 (mm)
AB 490-538847/5	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Metrohm ASupp4 4 (mm)
CV 490-538847/6	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Metrohm ASupp4 4 (mm)
CV 490-538847/7	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Metrohm ASupp4 4 (mm)
CV 490-538847/8	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Metrohm ASupp4 4 (mm)
CV 490-538847/9	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Metrohm ASupp4 4 (mm)
CV 490-538847/10	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Metrohm ASupp4 4 (mm)
CV 490-538847/11	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Metrohm ASupp4 4 (mm)
CV 490-538847/12	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Metrohm ASupp4 4 (mm)
ZZZZZ		08/27/2018 12:28	1		Metrohm ASupp4 4 (mm)
ZZZZZ		08/27/2018 12:43	1		Metrohm ASupp4 4 (mm)
ZZZZZ		08/27/2018 12:58	10		Metrohm ASupp4 4 (mm)
ZZZZZ		08/27/2018 13:12	1		Metrohm ASupp4 4 (mm)
ZZZZZ		08/27/2018 13:27	10		Metrohm ASupp4 4 (mm)
ZZZZZ		08/27/2018 13:42	10		Metrohm ASupp4 4 (mm)
ZZZZZ		08/27/2018 13:57	200		Metrohm ASupp4 4 (mm)
ZZZZZ		08/27/2018 14:12	1000		Metrohm ASupp4 4 (mm)
ZZZZZ		08/27/2018 14:27	1		Metrohm ASupp4 4 (mm)
CVT 490-538847/13	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Metrohm ASupp4 4 (mm)
CV 490-538847/14	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Metrohm ASupp4 4 (mm)
ZZZZZ		08/27/2018 15:11	100		Metrohm ASupp4 4 (mm)
ZZZZZ		08/27/2018 15:26	50		Metrohm ASupp4 4 (mm)
ZZZZZ		08/27/2018 15:41	50		Metrohm ASupp4 4 (mm)
ZZZZZ		08/27/2018 15:56	100		Metrohm ASupp4 4 (mm)
ZZZZZ		08/27/2018 16:10	200		Metrohm ASupp4 4 (mm)
ZZZZZ		08/27/2018 16:25	2		Metrohm ASupp4 4 (mm)
ZZZZZ		08/27/2018 16:40	2		Metrohm ASupp4 4 (mm)

## HPLC/IC ANALYSIS RUN LOG

Lab Name: TestAmerica Nashville Job No.: 490-158029-1  
SDG No.:  
Instrument ID: IC9 Start Date: 08/20/2018 09:44  
Analysis Batch Number: 537313 End Date: 08/20/2018 11:40

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STDA 490-537313/17 TD		08/20/2018 09:44	1	082018IC9_010da t-Conductivity.d	Metrohm ASupp4 4 (mm)
STDG 490-537313/2 TD		08/20/2018 09:44	1	082018IC9_011da t-Conductivity.d	Metrohm ASupp4 4 (mm)
STDG 490-537313/3 TD		08/20/2018 10:01	1	082018IC9_012da t-Conductivity.d	Metrohm ASupp4 4 (mm)
ICB 490-537313/4 TD		08/20/2018 10:01	1	082018IC9_013da t-Conductivity.d	Metrohm ASupp4 4 (mm)
ICB 490-537313/5 TD		08/20/2018 10:01	1	082018IC9_014da t-Conductivity.d	Metrohm ASupp4 4 (mm)
ICRT 490-537313/6		08/20/2018 10:42	1	082018IC9_015da t-Conductivity.d	Metrohm ASupp4 4 (mm)
ICB 490-537313/7 TD		08/20/2018 10:55	1	082018IC9_016da t-Conductivity.d	Metrohm ASupp4 4 (mm)
STDG 490-537313/8 TD		08/20/2018 11:05	1	082018IC9_017da t-Conductivity.d	Metrohm ASupp4 4 (mm)
STDG 490-537313/9 TD		08/20/2018 11:16	1	082018IC9_018da t-Conductivity.d	Metrohm ASupp4 4 (mm)
ICB 490-537313/10		08/20/2018 11:30	1	082018IC9_019da t-Conductivity.d	Metrohm ASupp4 4 (mm)
ICB 490-537313/11		08/20/2018 11:40	1		Metrohm ASupp4 4 (mm)

## HPLC/IC ANALYSIS RUN LOG

Lab Name: TestAmerica Nashville Job No.: 490-158029-1  
SDG No.:  
Instrument ID: IC9 Start Date: 09/04/2018 09:37  
Analysis Batch Number: 540592 End Date: 09/05/2018 02:38

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BT 490-540592-1		09/04/2018 09:37	1	490-158029-00604 -Conductivity	Metrohm ASupp4 4 (mm)
BT 490-540592-2		09/04/2018 09:37	1	490-158029-00604 -Conductivity	Metrohm ASupp4 4 (mm)
BT 490-540592-3		09/04/2018 10:10	1	490-158029-00604 -Conductivity	Metrohm ASupp4 4 (mm)
ME 490-540592-4		09/04/2018 10:10	1	490-158029-00604 -Conductivity	Metrohm ASupp4 4 (mm)
ME 490-540592-5		09/04/2018 10:10	1	490-158029-00604 -Conductivity	Metrohm ASupp4 4 (mm)
ME 490-540592-6		09/04/2018 10:10	1	490-158029-00604 -Conductivity	Metrohm ASupp4 4 (mm)
ME 490-540592-7		09/04/2018 10:10	1	490-158029-00604 -Conductivity	Metrohm ASupp4 4 (mm)
ME 490-540592-8		09/04/2018 10:10	1	490-158029-00604 -Conductivity	Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 10:47	1		Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 10:58	1		Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 11:10	1		Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 11:22	1		Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 11:33	1		Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 11:45	1		Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 11:56	1		Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 12:08	1		Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 12:19	1		Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 12:31	1		Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 12:43	1		Metrohm ASupp4 4 (mm)
490-158029-2		09/04/2018 12:54	1	490-158029-02304 -Conductivity	Metrohm ASupp4 4 (mm)
COV 490-540592-10		09/04/2018 13:05	1	490-158029-02304 -Conductivity	Metrohm ASupp4 4 (mm)
COV 490-540592-10		09/04/2018 13:10	1	490-158029-02304 -Conductivity	Metrohm ASupp4 4 (mm)
ME 490-540592-2		09/04/2018 13:20	1	490-158029-02304 -Conductivity	Metrohm ASupp4 4 (mm)
ME 490-540592-3		09/04/2018 13:20	1	490-158029-02304 -Conductivity	Metrohm ASupp4 4 (mm)
ME 490-540592-4		09/04/2018 13:20	1	490-158029-02304 -Conductivity	Metrohm ASupp4 4 (mm)
ME 490-540592-5		09/04/2018 13:20	1	490-158029-02304 -Conductivity	Metrohm ASupp4 4 (mm)
ME 490-540592-6		09/04/2018 13:20	1	490-158029-02304 -Conductivity	Metrohm ASupp4 4 (mm)
ME 490-540592-7		09/04/2018 13:20	1	490-158029-02304 -Conductivity	Metrohm ASupp4 4 (mm)
ME 490-540592-8		09/04/2018 13:20	1	490-158029-02304 -Conductivity	Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 14:15	1		Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 14:27	1		Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 14:39	1		Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 14:50	1		Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 15:02	1		Metrohm ASupp4 4 (mm)
ZZZZZ		09/04/2018 15:13	1		Metrohm ASupp4 4 (mm)

## HPLC/IC ANALYSIS RUN LOG

Lab Name: TestAmerica Nashville Job No.: 490-158029-1  
SDG No.:  
Instrument ID: IC9 Start Date: 09/04/2018 09:37  
Analysis Batch Number: 540592 End Date: 09/05/2018 02:38

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
129 490-540592-150	3374-IC9-001	09/04/2018 09:37	1	09051818_017aa	TestAmerica-ASup4-1mm
129 490-540592-152	3374-IC9-002	09/04/2018 09:37	1	09051818_017aa	TestAmerica-ASup4-1mm
129 490-540592-153	3374-IC9-003	09/04/2018 09:37	1	09051818_017aa	TestAmerica-ASup4-1mm

# QC Sample Results

Client: Environmental Standards Inc.  
Project/Site: CUF\_BS\_20180824\_1A

TestAmerica Job ID: 490-158029-2

## Method: EPA 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 490-158137-C-7-B MS

MS/MSD from another CUF BG SDG.  
Matrix: Solid  
Analysis Batch: 265026

Client Sample ID: Matrix Spike  
Prep Type: Total/NA  
Prep Batch: 264947

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec.	Limits	
	Result	Qualifier	Added	Result	Qualifier					
Antimony	1.52	F1	62.9	43.17	F1	mg/Kg	⊗	✓ 66	75 - 125	
Arsenic	Parent >4x spike	22.3	F2	5.03	16.28 4	mg/Kg	⊗	-120	75 - 125	
Barium		40.2		251	243.9	mg/Kg	⊗	81	75 - 125	
Beryllium		0.851		6.29	6.149	mg/Kg	⊗	84	75 - 125	
Boron		5.75	J	126	115.8	mg/Kg	⊗	✓ 88	75 - 125	
Cadmium		0.345		6.29	6.076	mg/Kg	⊗	91	75 - 125	
Calcium	Parent >4x spike	395		6290	5565	mg/Kg	⊗	82	75 - 125	
Chromium		12.7		25.1	40.20	mg/Kg	⊗	109	75 - 125	
Cobalt		6.06		62.9	63.93	mg/Kg	⊗	92	75 - 125	
Copper	Parent >4x spike	139		31.4	122.2 4	mg/Kg	⊗	-54	75 - 125	
Lead	Parent >4x spike	18.9		2.51	18.75 4	mg/Kg	⊗	-8	75 - 125	
Lithium		2.89	F1	6.29	10.60	mg/Kg	⊗	123	75 - 125	
Molybdenum		28.4		126	131.6	mg/Kg	⊗	82	75 - 125	
Nickel		33.3	B	62.9	91.55	mg/Kg	⊗	93	75 - 125	
Selenium		0.842	F1	1.26	1.445	F1	mg/Kg	⊗	✓ 48	75 - 125
Silver		0.0852	J	6.29	5.970	mg/Kg	⊗	94	75 - 125	
Thallium		1.98		6.29	7.251	mg/Kg	⊗	✓ 84	75 - 125	
Vanadium		60.8	F1	62.9	96.62	F1	mg/Kg	⊗	✓ 57	75 - 125
Zinc		45.4	B	62.9	99.21	mg/Kg	⊗	86	75 - 125	

Lab Sample ID: 490-158137-C-7-C MSD

Matrix: Solid  
Analysis Batch: 265026

Client Sample ID: Matrix Spike Duplicate  
Prep Type: Total/NA  
Prep Batch: 264947

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec.	Limits	RPD	Limit	
	Result	Qualifier	Added	Result	Qualifier							
Antimony	1.52	F1	63.5	41.94	F1	mg/Kg	⊗	✓ 64	75 - 125	✓ 3	20 35%	
Arsenic	Parent >4x spike	22.3	F2	5.08	20.40 4	mg/Kg	⊗	-37	75 - 125	22	20	
Barium		40.2		254	253.4	mg/Kg	⊗	84	75 - 125	4	20	
Beryllium		0.851		6.35	6.137	mg/Kg	⊗	83	75 - 125	0	20	
Boron		5.75	J	127	103.8	mg/Kg	⊗	✓ 77	75 - 125	✓ 11	20	
Cadmium		0.345		6.35	6.187	mg/Kg	⊗	92	75 - 125	2	20	
Calcium		395		6350	5371	mg/Kg	⊗	78	75 - 125	4	20	
Chromium		12.7		25.4	40.64	mg/Kg	⊗	110	75 - 125	1	20	
Cobalt		6.06		63.5	64.22	mg/Kg	⊗	92	75 - 125	0	20	
Copper	Parent >4x spike	139		31.7	134.3 4	mg/Kg	⊗	-15	75 - 125	9	20	
Lead	Parent >4x spike	18.9		2.54	21.56 4	mg/Kg	⊗	103	75 - 125	14	20	
Lithium		2.89	F1	6.35	11.45	F1	mg/Kg	⊗	✓ 135	75 - 125	8	20
Molybdenum		28.4		127	139.4	mg/Kg	⊗	87	75 - 125	6	20	
Nickel		33.3	B	63.5	92.72	mg/Kg	⊗	94	75 - 125	1	20	
Selenium		0.842	F1	1.27	1.602	F1	mg/Kg	⊗	✓ 60	75 - 125	10	20
Silver		0.0852	J	6.35	5.889	mg/Kg	⊗	91	75 - 125	1	20	
Thallium		1.98		6.35	7.274	mg/Kg	⊗	✓ 83	75 - 125	✓ 0	20	
Vanadium		60.8	F1	63.5	111.0	mg/Kg	⊗	79	75 - 125	14	20	
Zinc		45.4	B	63.5	100.6	mg/Kg	⊗	87	75 - 125	1	20	

J qual all  
except FB

TestAmerica Nashville

15-IN  
ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY  
METALS

Lab Name: TestAmerica Pittsburgh

Job No.: 490-158029-2

SDG No.:

ICP-MS Instrument ID: M

Start Date: 12/08/2018 End Date: 12/09/2018

Internal Standards %RI For:

Lab Sample ID	Time	Element Li-6	Q	Element Sc	Q	Element Y-89	Q	Element Rh-103	Q	Element In	Q
STD1 180-265026/2	18:12	100		100		100		100		100	
IC											
STD2 180-265026/3	18:19	106		105		99		93		95	
IC											
STD3 180-265026/4	18:24	101		104		98		98		99	
IC											
ICV 180-265026/5	18:28	102		105		100		96		97	
ICB 180-265026/6	18:33	111		116		107		106		104	
ICVL 180-265026/7	18:38	105		107		98		93		94	
ICSA 180-265026/8	18:43	87		86		89		82		84	
ICSAB 180-265026/9	18:48	91		92		88		83		85	
CCV 180-265026/10	18:52	91		88		87		84		86	
CCB1 180-265026/11	18:57	94		99		93		95		94	
CCV 180-265026/34	20:51	88		78		76		77		76	
CCB3 180-265026/35	20:56	81		76		74		76		74	
MB 180-264947/1-A	21:23	78		66		74		79		76	
LCS 180-264947/2-A	21:28	84		60		75		76		72	
490-158029-5	21:47	80		63				77		73	
CCV 180-265026/46	21:55	74		64		69		70		69	
CCB4 180-265026/47	22:00	82		74		73		75		73	
490-158029-2	22:09	90		72				94		80	
490-158029-3	22:14	85		83				81		78	
490-158029-4	22:18	85		82				72		70	
490-158029-5	22:23	76		55				70		63	
490-158029-6	22:28	81		52				68		63	
CCV 180-265026/58	22:54	76		67		69		69		63	
CCB5 180-265026/59	22:59	76		71		65		66		65	
490-158137-C-7-A SD	23:13	69		61		73		71		69	
^5											
490-158137-C-7-B MS	23:18	79		70				67		65	
490-158137-C-7-C	23:22	74		65				64		62	
MSD											
490-158137-C-7-A	23:27	64		55				55		54	
PDS											
CCV 180-265026/70	23:54	50		43		46		47		48	
CCB6 180-265026/71	23:59	55		49		49		50		51	
CCVL 180-265026/72	00:08	55		48		48		50		50	

This instrument does not give raw counts for IS, only %RS.  
%RS verified in raw data.

Qualify Cr, V, Co, Ni, Cu, Zn, As, and Se J/UJ in FD01.

FORM XV - IN

Ca, Cr, V, Mn, Fe, Co, Ni, Cu, Zn

**Job Narrative  
490-158029-1**

**Revised Report**

This report was revised to include the ICPMS data from TestAmerica Pittsburgh. The L4 with the TA-Pittsburgh data will be reported separately as 490-158029-2

**Receipt**

The samples were received on 8/24/2018 2:05 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 4.7° C and 5.7° C.

**HPLC/IC**

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

**Metals**

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

**Organic Prep**

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

**Job Narrative**  
**490-158029-2**

**Comments**

This report includes the L4 data from TestAmerica Pittsburgh for the ICPMS analysis.

**Metals**

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

## **SECTION 4**

### **CASE NARRATIVE AND CHAIN-OF-CUSTODY RECORD**

## Sample Summary

Client: Environmental Standards Inc.  
Project/Site: CUF\_BS\_20180824\_1A

TestAmerica Job ID: 490-158029-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-158029-1	CUF-BS-FB04-20180824 ✓	Water	✓ 08/24/18 08:30	08/24/18 14:05
490-158029-2	CUF-BS-BG08-0.0/0.5-20180824 ✓	Solid	✓ 08/24/18 09:26	08/24/18 14:05
490-158029-3	CUF-BS-BG08-0.9/2.9-20180824 ✓	Solid	✓ 08/24/18 09:51	08/24/18 14:05
490-158029-4	CUF-BS-BG08-6.5/8.5-20180824 ✓	Solid	✓ 08/24/18 10:22	08/24/18 14:05
490-158029-5	CUF-BS-FD01-20180824 ✓	Solid	✓ 08/24/18 00:01	08/24/18 14:05
490-158029-6	CUF-BS-BG08-10.0/12.0-20180824 ✓	Solid	✓ 08/24/18 10:41	08/24/18 14:05



Tennessee Valley Authority

TVA Environmental Investigations

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	2
COC No.:	CUF_BS_20180824_1A		
1	of	1	Pages
Task Desc:	CUF_BS		

Required Ship-to Lab:		Required Project Information:			Required Sampler Information:			
Lab Name:	TestAmerica Nashville	Site ID #:	CUMBERLAND FOSSIL PLANT		Sampler:	Suana Bolden and Walker Padgett		
Lab Address:	29360 Foster Creighton Dr Nashville, TN 37204	Project #:	177588209		Sampling Company:	Stantec		
		Site Address:	815 Cumberland City Road Cumberland City State, Zip: TN, 37763		Address:	Warehouse Row North 1110 Market Street, Suite 214A Chattanooga TN Phone: (869) 619-8010		
Lab Manager Contact Information		Site PM Name:	Roy Quinn					
Lab P/M:	Gail Lape	Phone/Fax:	423-751-3753		Sampling Team Number:	1		
Phone/Fax:	615-301-5741/615-726-3404	Site PM Email:	rlapin@tva.gov		Send EDD/Hard Copy to:	tva-sl@envard.com		
Lab Email:	Gail.Lape@testamericainc.com							

# SMC	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth		MATRIX CODE G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	DISHWASHER WASHABLE	PRESERVE WATER	ANALYSIS METHOD	PRESERVE IN SOLVENT	PRESERVE IN BOTTLE	PRESERVE IN BLANKET	PRESERVE IN MIXED	PRESERVE IN DUST	PRESERVE IN LIQUID	PRESERVE IN VACUUM	PRESERVE IN WATER	PRESERVE IN WAX	PRESERVE IN ZINC
			Depth Unit	Start Depth																			
1	CUF_BS-PB04-20180824	BG-08	NA	NA	W G	FB	8/24/2018	0830	2		<input type="checkbox"/>	X	X	X	X	X	X	X	X	X	X	X	
2	CUF_BS-BG08-0.0/0.5-20180824	BG-08	0.0	0.5	S G	N	8/24/2018	0926	2		<input type="checkbox"/>	X	X	X	X	X	X	X	X	X	X	X	
3	CUF_BS-BG08-0.9/2.9-20180824	BG-08	0.9	2.9	S G	N	8/24/2018	0951	2		<input type="checkbox"/>	X	X	X	X	X	X	X	X	X	X	X	
4	CUF_BS-BG08-6.5/8.5-20180824	BG-08	6.5	8.5	S G	N	8/24/2018	1022	2		<input type="checkbox"/>	X	X	X	X	X	X	X	X	X	X	X	
5	CUF_BS-FD01-20180824	BG-08	-	-	S G	FD	8/24/2018	-	2		<input type="checkbox"/>	X	X	X	X	X	X	X	X	X	X	X	
6	CUF_BS-BG08-10.0/12.0-20180824	BG-08	10.0	12.0	S G	N	8/24/2018	1041	2		<input type="checkbox"/>	X	X	X	X	X	X	X	X	X	X	X	
7											<input type="checkbox"/>												
8											<input type="checkbox"/>												
9											<input type="checkbox"/>												
10											<input type="checkbox"/>												
11											<input type="checkbox"/>												
12											<input type="checkbox"/>												
13											<input type="checkbox"/>												

Additional Comments/Special Instructions:

Additional volume collected should be used for MS/MSDs.

CUF\_BACKGROUNDSoil: Perform MS/MSD on sample identified above

CUF\_BACKGROUNDSoil\_BLANKS: Anions - unpreserved; Metals – preserved w/ HNO3 to pH<2

RElinquished By / Affiliation			DATE	TIME	Accepted By / Affiliation	DATE	TIME	Sample Receipt Conditions			
Suana Bolden (Stantec)			8/24/2018	12:00				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SHIPPING METHOD:			SAMPLER NAME AND SIGNATURE					Temperature in C: _____	Sample intact?	Sample intact?	Top Blank?
Courier			Suana Bolden								



THE LEADER IN ENVIRONMENTAL TESTING  
Nashville, TN



490-158029 Chain of Custody

## COOLER RECEIPT FORM

Cooler Received/Opened On 08-24-2018 @ 1405

Time Samples Removed From Cooler 1545 Time Samples Placed In Storage 1556 (2 Hour Window)

1. Tracking # \_\_\_\_\_ (last 4 digits, FedEx) Courier: Lab  
IR Gun ID 31470368 pH Strip Lot N/A Chlorine Strip Lot N/A
2. Temperature of rep. sample or temp blank when opened: 4.7 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?  
If yes, how many and where: 1 Front  YES...NO...NA
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 (initial) ADH
7. Were custody seals on containers:  YES  NO and intact  YES...NO...NA  
Were these signed and dated correctly? ADH 6/24/18  YES...NO...NA ADH 6/24/18
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 # 10f

I certify that I unloaded the cooler and answered questions 7-14 (initial) ADH

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 (initial) ADH

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 (initial) ADH

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

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

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING  
Nashville, TN

Loc: 490  
158029

## COOLER RECEIPT FORM

Cooler Received/Opened On 08-24-2018 @ 1405

Time Samples Removed From Cooler 1545 Time Samples Placed In Storage 1556 (2 Hour Window)

1. Tracking # 1545 (last 4 digits, FedEx) Courier: LSD  
IR Gun ID 31470368 pH Strip Lot N/A Chlorine Strip Lot N/A
2. Temperature of rep. sample or temp blank when opened: 5.7 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: 1 Front
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 (initial) ADH
7. Were custody seals on containers: YES NO and Intact YES...NO...NA  
Were these signed and dated correctly? YES...NO...NA 22/08/18
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 # ADT

I certify that I unloaded the cooler and answered questions 7-14 (initial) ADT

- 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 (initial) ADT
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 (initial) ADT
- I certify that I attached a label with the unique LIMS number to each container (initial) ADT
21. Were there Non-Conformance Issues at login? YES...NO...# Was a NCM generated? YES...NO...#



Tennessee Valley Authority

## TVA Environmental Investigations

## Chain-of-Custody / Analytical Request Document

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

COOLER No.:		of	Z
CCG No.:	CUF BS	20180824	1A
1	of	1	Pages
Task Desc:	CUF_BS		

Loc: 490  
158029

Required Ship to Lab:		Required Project Information:		Required Sampler Information	
Lab Name:	TestAmerica Nashville	Site ID #:	CUMBERLAND FOSSIL PLANT	Sampler:	Suzanne Bolden and Walker Padgett
Lab Address:	29360 Foster Creighton Dr Nashville, TN 37204	Project #:	177588208	Sampling Company:	Stantec
		Site Address:	815 Cumberland City Road	Address:	Warehouse Row North 1110 Market Street, Suite 214A Chattanooga TN
		City:	Cumberland City   State, Zip: TN, 37763	City/State:	
		Site PM Name:	Roy Quinn	Phone:	(423) 819-8010
Lab Manager Contact Information					
Lab PM:	Gail Lage	Phone/Fax:	423-751-3753	Sampling Team Number:	1
Phone/Fax:	615-301-5741/615-726-3404	Site PM Email:	rlquinn@tva.gov	Send EDD/Hard Copy to:	tva-el@envirodat.com
Lab Email:	Gail.Lage@testamericainc.com				

# S/N#L	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth		MATRIX CODE	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	REMAINING QUANTITY	Comments/ Lab Sample I.D.	SHIPPING	MSDS
			Start Depth	End Depth								
1	CUF-BS-FB04-20180824	BG-08	NA	NA	W	G	FB	8/24/2018	0830	2		
2	CUF-BS-BG08-0.0/0.5-20180824	BG-08	0.0	0.5	S	G	N	8/24/2018	0926	2		
3	CUF-BS-BG08-0.9/2.9-20180824	BG-08	0.9	2.9	S	G	N	8/24/2018	0951	2		
4	CUF-BS-BG08-6.5/8.5-20180824	BG-08	6.5	8.5	S	G	N	8/24/2018	1022	2		
5	CUF-BS-FD01-20180824	BG-08	-	-	S	G	N	8/24/2018	-	2		
6	CUF-BS-BG08-10.0/12.0-20180824	BG-08	10.0	12.0	S	G	N	8/24/2018	1041	2		
7												
8												
9												
10												
11												
12												
13												

ST 8/24/2018

Additional Comments/Special Instructions:		RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Sample Receipt Conditions			
Additional volume collected should be used for MS/MSDs.		Suzanne Bolden (Stanted)	8/24/2018	12:00	John Blanton	8/24/2018	12:00	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CUF_BACKGROUNDSoil: Perform MS/MSD on sample identified above								<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CUF_BACKGROUNDSoil_BLANKS: Anions – unpreserved; Metals – preserved w/ HNO3 to pH<2								<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
		SHIPPING METHOD:	SAMPLER NAME AND SIGNATURE								
		Courier	Suzanne Bolden 								
			8/24/2018								
			8/24/2018								

ST 8/24/2018

7/1/17

## TestAmerica Nashville

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

M400

## Chain of Custody Record

<b>Client Information (Sub Contract Lab)</b>		Sampler:	Lab PM: Lage, Gail	490-158029 Chain of Custody	stAmerica DEF IN ENVIRONMENTAL TESTING
Client Contact: Shipping/Receiving		Phone:	E-Mail: gail.lage@testamericainc.com	133.1 of 1	
Company: TestAmerica Laboratories, Inc.				Accreditations Required (See note):	
Address: 301 Alpha Drive, RIDC Park, City: Pittsburgh State, Zip: PA, 15238		Due Date Requested: 12/12/2018	TAT Requested (days):	Analysis Requested	
Phone: 412-963-7058(Tel) 412-963-2468(Fax) Email:		PO #:	WO #:		
Project Name: CUF_BS_20180824_1A		Project #: 49014071	SSOW#:		
Site:					
Sample Identification - Client ID (Lab ID)		Sample Date: 8/24/18	Sample Time: 08:30 Central	Sample Type (C=comp, G=grab) W=Water, S=solid, C=charcoal, T=Toxic, A=air	Matrix (W=water, S=solid, C=charcoal, T=Toxic, A=air) Water
CUF-BS-FB04-20180824 (490-158029-1)				Field Preserved Samples (Yes or No) <input checked="" type="checkbox"/> Yes	Transit Preserved Samples (Yes or No) <input checked="" type="checkbox"/> Yes
				Preservation Method (MSDS No/Yes or No) <input checked="" type="checkbox"/> Yes	Transit Number of Containers <input checked="" type="checkbox"/> 1
Special Instructions/Note: TVA					
<p>Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte &amp; accreditation compliance upon our 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/test/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 compliance to TestAmerica Laboratories, Inc.</p>					
Possible Hazard Identification			Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		
Unconfirmed			<input type="checkbox"/> Return To Client	<input type="checkbox"/> Disposal By Lab	<input type="checkbox"/> Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)			Primary Deliverable Rank: 2		
Special Instructions/QC Requirements:					
Empty Kit Relinquished by:  <i>M. Gil</i>		Date:	Time:	Method of Shipment:	
Relinquished by:  <i>M. Gil</i>		Date/Time:  <i>17-6-18@ 005</i>	Company: <i>Times</i>	Received by:  <i>John Goss</i>	Date/Time:  <i>17-6-18 1000</i>
Relinquished by:		Date/Time:	Company:	Received by:	Date/Time:
Custody Seals Intact: A Yes A No		Cooler Temperature(s) °C and Other Remarks:			

## TestAmerica Nashville

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

## Chain of Custody Record



<b>Client Information (Sub Contract Lab)</b>		Sampler:	Lab PM: Lage, Gail	490-158029 Chain of Custody	
Client Contact: Shipping/Receiving	Phone:	E-Mail: gail.lage@testamericanlnc.com	Tennessee		No: 83340.1
Company: TestAmerica Laboratories, Inc.			Accreditations Required (See note):		Page 1 of 1
Address: 301 Alpha Drive, RIDC Park,	Due Date Requested: 12/12/2016			Analysis Requested	
City: Pittsburgh	TAT Requested (days):				
State, Zip: PA, 15238	PO #:				
Phone: 412-963-7058(Tel) 412-963-2468(Fax)	WO #:				
Email:					
Project Name: CUF_BS_20180824_1A	Project #: 49014071				
Site:	SSOW#:				
Sample Identification - Client ID (Lab ID)		Sample Date	Sample Time	Sample Type (C=Comp; G=Grab); at-env. Analyzed	Matrix (water, sediment, overburden, etc.)
				Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)
				Preservation Code:	Preservation (Yes or No)
CUF_BS-BG08-0/0/0.5-20180824 (490-158029-1)		8/24/18	09:26 Central	Solid	X
CUF_BS-BG08-0/9/2.9-20180824 (490-158029-3)		8/24/18	09:51 Central	Solid	X
CUF_BS-BG08-6.5/8.5-20180824 (490-158029-4)		8/24/18	10:22 Central	Solid	X
CUF_BS-FD01-20180824 (490-158029-5)		8/24/18	00:01 Central	Solid	X
CUF_BS-BG08-10.0/12.0-20180824 (490-158029-6)		8/24/18	10:41 Central	Solid	X
Total Number of containers					
Special Instructions/Note:					
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analysis & accreditation compliance upon our 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/test/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 compliance to TestAmerica Laboratories, Inc.					
Possible Hazard Identification			Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		
Unconfirmed			<input type="checkbox"/> Return To Client	<input type="checkbox"/> Disposal By Lab	<input type="checkbox"/> 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: <i>Munder Lages</i>		Date/Time: 12-6-18/030	Company: 91591	Received by: <i>R. Lages</i>	Date/Time: 12/7/18 10:00 Company: <i>Mr. B</i>
Relinquished by:		Date/Time:	Company:	Received by:	Date/Time:
Relinquished by:		Date/Time:	Company:	Received by:	Date/Time:
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.: Cooler Temperature(s) °C and Other Remarks:			

## Login Sample Receipt Checklist

Client: Environmental Standards Inc.

Job Number: 490-158029-2

**Login Number: 158029**

**List Number: 2**

**Creator: Neri, Tom**

**List Source: TestAmerica Pittsburgh**

**List Creation: 12/07/18 12:38 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.	True	
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	2.0/2.2
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?	N/A	Received project as a subcontract.
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## Login Sample Receipt Checklist

Client: Environmental Standards Inc.

Job Number: 490-158029-2

**Login Number: 158029**

**List Source: TestAmerica Pittsburgh**

**List Number: 3**

**List Creation: 12/07/18 01:23 PM**

**Creator: Say, Thomas C**

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

**SECTION 5**

**PROJECT CORRESPONDENCE**

## **Andrew Piasecki**

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**From:** Rock J. Vitale  
**Sent:** Wednesday, February 6, 2019 2:11 PM  
**To:** DeAnna Aungst; Jacob Gruzalski  
**Cc:** Jennifer Gable; Andrew Piasecki; Stephanie Lein  
**Subject:** FW: TVA- CUF- Data rescind  
**Attachments:** Datarescind- CUF-Nash-AFV-020119.pdf

Jacob – please create a “Background Rescind Letter” subfolder in W/TVA/EIP CUF and stash this letter in there.

DeAnna – please document the letter in DM documentation and document the *removal* of the Nashville data for CUF background soils from the database.

thanks

Rock J. Vitale, CEAC  
Consulting Chemistry

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**From:** Vicinie, Rusty [mailto:[Rusty.Vicinie@testamericainc.com](mailto:Rusty.Vicinie@testamericainc.com)]  
**Sent:** Wednesday, February 6, 2019 12:31 PM  
**To:** Amanda Cover  
**Cc:** Rock J. Vitale ; Lage, Gail ; Bagawandoss, Doss ; Salomon, Sherry ; Lowe, Debbie ; Vicinie, Rusty  
**Subject:** TVA- CUF- Data rescind

Good afternoon Amanda

Please find our official rescind note on the data that has been being discussed. If any questions please contact me or Gail directly.

**ALBERT “RUSTY” VICINIE**  
Vice President- Operations

Eurofins TestAmerica  
301 Alpha Drive  
Pittsburgh, PA 15238  
USA

Phone: 412-963-2421  
Mobile: 724-312-3359

E-mail: [Rusty.vicinie@testamericainc.com](mailto:Rusty.vicinie@testamericainc.com)  
[www.EurofinsUS.com](http://www.EurofinsUS.com) | [www.TestAmericainc.com](http://www.TestAmericainc.com)





Albert F. Vicinie III  
Vice President Operations  
TestAmerica Laboratories, Inc.

February 1, 2019

Ms. Amanda Cover  
Sr. Quality Assurance Scientist  
Environmental Standards, Inc.  
1140 Valley Forge Road  
Phoenixville, PA 19460

RE: TVA data –CUF BGS

Amanda

We have been discussing a data set associated with the Cumberland background soils and sediments that were initially analyzed at our Nashville laboratory. The data validation and subsequent review revealed a number of data imperfection in the data set for samples associated with the specific job numbers below.

CUF BGS	490-157829-1
CUF BGS	490-157892-1
CUF BGS	490-157991-1
CUF BGS	490-158029-1
CUF BGS	490-158137-1
CUF BGS	490-158232-1
CUF Sed	490-161141-1

While there are usable data within this data set, there are numerous imperfections across multiple analyses of these samples that make it challenging to determine which result from the various runs is most accurate and defendable. We have analyzed all of these samples in our Pittsburgh laboratory and this data set does not have the imperfections seen in the Nashville data set. Also, it is easier to validate and defend. As a matter of convenience and to provide clear guidance to the project team, TestAmerica is rescinding the data set from Nashville for the samples associated with the above jobs. We are providing the Pittsburgh laboratory data as the data of record for these samples.

I apologize for the inconvenience and the effort your team has invested in this data set. If any questions, please contact me directly at either [rusty.vicinie@testamericainc.com](mailto:rusty.vicinie@testamericainc.com) or 724-312-3359.

Respectfully submitted

Albert F. Vicinie III  
Vice President Operations

## **Andrew Piasecki**

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**From:** CSO – TVA Projects <TVAProjects@testamericainc.com>  
**Sent:** Friday, February 8, 2019 1:32 PM  
**To:** Andrew Piasecki; CSO – TVA Projects  
**Cc:** TVA\_Deliverables; Amanda Cover; Jennifer Gable; Rock J. Vitale  
**Subject:** RE: CUF - BGS/Sed data

The BG are done. I'm working on Sed – it's giving me a fits. I hope to have it sent later today.

Thanks

### **Gail Lage**

Phone: 615-301-5741

E-mail: [Gail.Lage@testamericainc.com](mailto:Gail.Lage@testamericainc.com)

---

**From:** Andrew Piasecki [mailto:[apiasecki@envstd.com](mailto:apiasecki@envstd.com)]  
**Sent:** Thursday, January 31, 2019 9:21 AM  
**To:** CSO – TVA Projects  
**Cc:** TVA\_Deliverables; Amanda Cover; Jennifer Gable; Rock J. Vitale  
**Subject:** RE: CUF - BGS/Sed data

 External Email

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Hi Gail,

Thanks for the update. Also, just as a reminder, please report strontium in CUF Sediment SDG 490-161141-1.

Andrew L. Piasecki  
Quality Assurance Chemist  
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**Emergency Response Quality Assurance Hotline: 855.374.7272**



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**From:** CSO – TVA Projects [mailto:[TVAProjects@testamericainc.com](mailto:TVAProjects@testamericainc.com)]  
**Sent:** Wednesday, January 30, 2019 11:33 AM  
**To:** Andrew Piasecki <[apiasecki@envstd.com](mailto:apiasecki@envstd.com)>  
**Cc:** CSO – TVA Projects <[TVAProjects@testamericainc.com](mailto:TVAProjects@testamericainc.com)>; TVA\_Deliverables <[tva\\_deliverables@envstd.com](mailto:tva_deliverables@envstd.com)>;

Amanda Cover <ACover@envstd.com>; Jennifer Gable <jgable@envstd.com>; Rock J. Vitale <rvitale@envstd.com>  
**Subject:** RE: CUF - BGS/Sed data

Andrew – I should be able to have the revised reports/EDDs and the letter to you by the beginning of next week.

**GAIL A LAGE**  
Project Manager  
**TestAmerica**  
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**From:** Andrew Piasecki [<mailto:apiasecki@envstd.com>]  
**Sent:** Tuesday, January 29, 2019 1:24 PM  
**To:** Lage, Gail  
**Cc:** CSO – TVA Projects; TVA\_Deliverables; Amanda Cover; Jennifer Gable; Rock J. Vitale  
**Subject:** CUF - BGS/Sed data

**External Email**

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Hi Gail,

As discussed on our call, please proceed with reporting the CUF Background soil and sediment data from Pittsburgh for the SDGs listed below. We would also like to request a formal letter rescinding the Nashville data for these SDGs. Can you please review the list and provide a schedule for when we should expect to receive the deliverables?

CUF BGS	490-157829-1
CUF BGS	490-157892-1
CUF BGS	490-157991-1
CUF BGS	490-158029-1
CUF BGS	490-158137-1
CUF BGS	490-158232-1
CUF Sed	490-161141-1

Thank you,

Andrew L. Piasecki  
Quality Assurance Chemist  
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## **Andrew Piasecki**

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**From:** Lage, Gail <Gail.Lage@testamericaninc.com>  
**Sent:** Wednesday, December 5, 2018 6:46 PM  
**To:** Jennifer Gable; Amanda Cover  
**Cc:** CSO – TVA Projects; Andrew Piasecki  
**Subject:** nashville metals

Here is what I have for the CUF and KIF that were run or were being run in Nashville. Currently, we have 490-164294 as the highest priority in Pittsburgh, but let me know as soon as possible, if there is another job that needs to be a higher.

The first 5 jobs, it sounds like St. Louis does still have volume for those, so I will have those shipped to Pittsburgh tomorrow. Do you need the KIF Watersource re-run?

JobID	Job Status	Job Description	Job Received	Nashville status
490-157829-1		CUF_BS_20180821_1A	8/21/2018 20:00	Reported - data questions
490-157892-1		CUF_BS_20180822_1A	8/22/2018 17:45	Reported
490-157991-1		CUF_BS_20180823_1A	8/23/2018 19:54	Reported
490-158029-1		CUF_BS_20180824_1A	8/24/2018 14:05	Reported
490-158137-1		CUF_BS_20180827_1A	8/27/2018 19:00	Reported - data questions
490-158232-1	ship to Pittsburgh on 12/5	CUF_BS_20180828_1A	8/28/2018 20:12	Reported - data questions
490-161141-1	ship to Pittsburgh on 12/5	CUF_SED_20181008_1A	10/12/2018 16:00	Reported - elevated ND?
490-161580-1	ship to Pittsburgh on 12/5	CUF_SED_20181016_1A	10/19/2018 12:00	Run but not reported
490-164092-1	ship to Pittsburgh on 12/5	CUF_BS_20181129_2A	11/30/2018 15:10	Analysis started
490-164109-1	ship to Pittsburgh on 12/5	CUF_BS_20181129_1A	11/30/2018 15:10	Analysis started
490-164294-1	ship to Pittsburgh on 12/5	CUF_BS_20181203_1A	12/4/2018 17:40	
490-161585-1		KIF-EI_WATERSOURCE_20181019_A	10/19/2018 14:28	Reported
490-163316-1	ship to Pittsburgh on 12/5	KIF_CCR_20181112_1A	11/15/2018 9:00	Totals run but not reported

Thanks

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## **Andrew Piasecki**

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**From:** Lage, Gail <Gail.Lage@testamericainc.com>  
**Sent:** Friday, November 30, 2018 9:30 AM  
**To:** Amanda Cover; Andrew Piasecki  
**Cc:** CSO – TVA Projects; TVA\_Deliverables; Jennifer Gable  
**Subject:** RE: CUF BGS metals calibration issues  
**Attachments:** image001.png.html

I do not have an update, but there were meetings about these job yesterday. I will try and get an update this morning.

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**From:** Amanda Cover [mailto:[ACover@envstd.com](mailto:ACover@envstd.com)]  
**Sent:** Friday, November 30, 2018 8:28 AM  
**To:** Andrew Piasecki; Lage, Gail  
**Cc:** CSO – TVA Projects; TVA\_Deliverables; Jennifer Gable  
**Subject:** RE: CUF BGS metals calibration issues

-External Email-

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Hi Gail,

Do you have any updates on the SDG below and also the 2 remaining SDGs: 490-158232 and 490-158137? I know that you are waiting for the lab to provide details on how the reported results were determined for 490-158232 and 490-158137. We're going to need to get resolution on these very soon.

Thanks  
Amanda

Amanda J. Cover  
Senior Quality Assurance Chemist  
**Environmental Standards, Inc.**  
610.935.5577 x408

---

**From:** Andrew Piasecki  
**Sent:** Wednesday, November 28, 2018 1:37 PM  
**To:** Lage, Gail <Gail.Lage@testamericainc.com>  
**Cc:** CSO – TVA Projects <[TVAProjects@testamericainc.com](mailto:TVAProjects@testamericainc.com)>; TVA\_Deliverables <[tva\\_deliverables@envstd.com](mailto:tva_deliverables@envstd.com)>;

Amanda Cover <ACover@envstd.com>; Jennifer Gable <jgable@envstd.com>

**Subject:** FW: CUF BGS metals calibration issues

Hi Gail,

It appears that the reprocessed results from the “reported” columns in the attached spreadsheet were not reported in the data packages and EDD that we currently have for 490-157829-1. Can you please look into this? The results that are reported in the data packages and EDD that we currently have correspond with the “ALL” columns in the attached spreadsheet and appear to be quantitated using the failing calibration.

Please confirm and provide any necessary revisions for all samples and QC.

Thanks,

Andrew L. Piasecki  
Quality Assurance Chemist  
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**From:** Lage, Gail [mailto:[Gail.Lage@testamericainc.com](mailto:Gail.Lage@testamericainc.com)]

**Sent:** Tuesday, November 20, 2018 11:11 AM

**To:** Andrew Piasecki <[apiasecki@envstd.com](mailto:apiasecki@envstd.com)>; CSO – TVA Projects <[TVAProjects@testamericainc.com](mailto:TVAProjects@testamericainc.com)>; Amanda Cover <[ACover@envstd.com](mailto:ACover@envstd.com)>

**Cc:** Jennifer Gable <[jnable@envstd.com](mailto:jgable@envstd.com)>; TVA\_Deliverables <[tva\\_deliverables@envstd.com](mailto:tva_deliverables@envstd.com)>

**Subject:** RE: CUF BGS metals calibration issues

Andrew – Here is the correct table for 490-157829 – These are the instrument results. The “All” has all the calibration points and the “reported” are the results that were reported with the 2<sup>nd</sup> point removed from the calibration.

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**From:** Andrew Piasecki [mailto:[apiasecki@envstd.com](mailto:apiasecki@envstd.com)]

**Sent:** Tuesday, November 13, 2018 11:39 AM

**To:** CSO – TVA Projects; Amanda Cover

**Cc:** Jennifer Gable; TVA\_Deliverables

**Subject:** RE: CUF BGS metals calibration issues

**External Email**

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Hi Gail,

The spreadsheet doesn't appear to contain the data for the 490-157829 project samples. Can you please clarify and confirm what was provided.

Thanks,  
Andrew

Andrew L. Piasecki  
Quality Assurance Chemist  
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---

**From:** CSO – TVA Projects [mailto:[TVAProjects@testamericainc.com](mailto:TVAProjects@testamericainc.com)]  
**Sent:** Monday, November 12, 2018 3:24 PM  
**To:** CSO – TVA Projects <[TVAProjects@testamericainc.com](mailto:TVAProjects@testamericainc.com)>; Amanda Cover <[ACover@envstd.com](mailto:ACover@envstd.com)>  
**Cc:** Jennifer Gable <[jgable@envstd.com](mailto:jgable@envstd.com)>; TVA\_Deliverables <[tva\\_deliverables@envstd.com](mailto:tva_deliverables@envstd.com)>  
**Subject:** RE: CUF BGS metals calibration issues

The attached table is the comparison for 490-157829 – the reported results were calculated again the curve without the 2<sup>nd</sup> point (the passing calibration).

The “Allpts” column is the original ICAL with the outlier. The “a” column is the ICAL without the outlier. The Supervisor indicated that she saw the initial failure and made the ICAL adjustment and reprocessed the data. The reported results should be acceptable. They did not attach the ICAL used for the samples. A quick check indicates an average difference between the ICALs to be approximately 2.3 %.

We are still working at pulling the tables with all results for 490-158137 and 490-158232.

Thanks

**GAIL A LAGE**  
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**From:** CSO – TVA Projects  
**Sent:** Wednesday, November 07, 2018 10:10 AM  
**To:** 'Amanda Cover'  
**Cc:** CSO – TVA Projects; Jennifer Gable; TVA\_Deliverables  
**Subject:** RE: CUF BGS metals calibration issues

Can we set up a call for Thursday at 10 am ET (9 am CT)

Thanks

**GAIL A LAGE**  
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**From:** Amanda Cover [<mailto:ACover@envstd.com>]  
**Sent:** Tuesday, November 06, 2018 10:27 AM  
**To:** Lage, Gail  
**Cc:** CSO – TVA Projects; Jennifer Gable; TVA\_Deliverables  
**Subject:** CUF BGS metals calibration issues

**[External Email]**

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Hi Gail,

We have identified two more situations in addition to SDG 490-158232-1 where results appear to be reported from ICALs with failing correlation coefficients (< 0.998).

The following SDGs are impacted:

- 490-157829-1: the ICAL performed on instrument ICPMS3 on 8/24/18 failed for all of the metals. All soil samples are impacted along with the QC.
- 490-158137-1: the ICAL performed on instrument ICPMS4 on 8/30/18 failed for Ag, Be, Cd, Co, Cr, Mo, Ni, and Pb. All soil samples are impacted along with the QC.

Please ask the laboratory to review this information.

In addition, we would like to schedule a call to discuss this issue with QA, the metals department manager, and anyone else that TestAmerica thinks should participate.

Below is our availability for the remainder of the week:

- Wednesday: 3:30-4:30 ET
- Thursday: 10-11am ET; 2:30-4:00 ET
- Friday: 1:30-4:30 ET

Please let me know times that work for everyone and I will send out an invite.

Thanks  
Amanda

Amanda J. Cover  
Senior Quality Assurance Chemist  
**Environmental Standards, Inc.**  
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