

**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 21, 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 and 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 490-157829-1 and 490-157829-2.

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-BG07-1.5/3.5-20180821	490-157829-1 490-157829-2	490-157829-1 490-157829-2	Soil	8/21/18	A, Hg, pH M
CUF-BS-BG07-6.1/8.1-20180821	490-157829-2	490-157829-1 490-157829-2	Soil	8/21/18	A, Hg, pH M
CUF-BS-BG07-11.6/13.6-20180821	490-157829-3	490-157829-1 490-157829-2	Soil	8/21/18	A, Hg, pH M
CUF-BS-BG07-15.5/17.5-20180821	490-157829-4	490-157829-1 490-157829-2	Soil	8/21/18	A, Hg, pH M
CUF-BS-BG07-0/0.66-20180821	490-157829-5	490-157829-1 490-157829-2	Soil	8/21/18	A, Hg, pH M
CUF-BS-FB01-20180821 (Field Blank)	490-157829-6	490-157829-1 490-157829-2	Aq	8/21/18	A, Hg 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
Laboratory 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	Samples	Validation Qualifier(s)	Reason for Qualification
molybdenum	490-157829-2	All samples except CUF-BS-FB01-20180821	U*	BL
chloride	490-157829-1	CUF-BS-BG07-6.1/8.1-20180821	U*	BE, BF, BL
fluoride	490-157829-1	CUF-BS-BG07-15.5/17.5-20180821 and CUF-BS-BG07-0/0.66-20180821	U*	BF, BL
sulfate	490-157829-1	CUF-BS-BG07-11.6/13.6-20180821, CUF-BS-BG07-15.5/17.5-20180821, and CUF-BS-BG07-0/0.66-20180821	U*	BE, BF, BL
fluoride	490-157829-1	All samples except CUF-BS-FB01-20180821	J (unless flagged "U*")/UR	M-

Analyte(s)	Job Number	Samples	Validation Qualifier(s)	Reason for Qualification
sulfate	490-157829-1	All samples except CUF-BS-FB01-20180821	J (unless flagged "U*"/UJ)	M-
antimony and selenium	490-157829-2	All samples except CUF-BS-FB01-20180821	J	M-
lithium	490-157829-2	All samples except CUF-BS-FB01-20180821	J	M+

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 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
	Percent Moisture:			%	13.6									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.208	J	M-,RL	0.0739	0.0739	0.239	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	4.04			0.0310	0.0310	0.119	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	26.3			0.0680	0.0680	1.19	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.298			0.00894	0.00894	0.119	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	1.16	J	RL	0.910	0.910	9.54	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.0277	J	RL	0.0203	0.0203	0.119	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	225			10.7	10.7	59.6	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	11.6			0.0787	0.0787	0.239	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	5.44			0.00990	0.00990	0.0596	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	6.42			0.135	0.135	0.239	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	7.58			0.0417	0.0417	0.119	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	3.62	J	M+	0.329	0.329	0.596	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG		U*	BL	1.57	1.57	1.57	N	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	7.09			0.0727	0.0727	0.119	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.241	J	M-,RL	0.0716	0.0716	0.596	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG		U		0.0167	0.0167	0.119	N	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.162			0.0155	0.0155	0.119	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	17.5			0.0727	0.0727	0.119	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	34.4			0.398	0.398	0.596	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG	0.0393	J	RL	0.0340	0.0340	0.113	Y	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	4.7			0.1	0.1	0.1	Y	Yes	1	WET
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		8.03	8.03	11.5	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG		UR	M-	0.917	0.917	1.15	N	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG	46.3	J	M-	6.88	6.88	11.5	Y	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:			%	12.5									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.194	J	M-,RL	0.0709	0.0709	0.229	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	5.74			0.0297	0.0297	0.114	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	58.1			0.0652	0.0652	1.14	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.611			0.00857	0.00857	0.114	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	1.42	J	RL	0.872	0.872	9.15	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.0392	J	RL	0.0194	0.0194	0.114	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	854			10.2	10.2	57.2	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	16.7			0.0755	0.0755	0.229	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	2.03			0.00949	0.00949	0.0572	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	10.5			0.129	0.129	0.229	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	10.2			0.0400	0.0400	0.114	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	4.66	J	M+	0.316	0.316	0.572	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG		U*	BL	1.24	1.24	1.24	N	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	9.76			0.0697	0.0697	0.114	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.306	J	M-,RL	0.0686	0.0686	0.572	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG		U		0.0160	0.0160	0.114	N	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.224			0.0149	0.0149	0.114	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	24.2			0.0697	0.0697	0.114	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	25.6			0.382	0.382	0.572	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG		U		0.0334	0.0334	0.111	N	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	4.8			0.1	0.1	0.1	Y	Yes	1	WET
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U*	BE,BF,BL,RL	8.74	8.74	11.2	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG		UR	M-	0.900	0.900	1.12	N	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG		UJ	M-	6.75	6.75	11.2	N	Yes	1	DRY

				<b>Lab Sample ID</b>	490-157829-3									
				<b>Sys Sample Code</b>	CUF-BS-BG07-11.6/13.6-20180821									
				<b>Sample Name</b>	CUF-BS-BG07-11.6/13.6-20180821									
				<b>Sample Date</b>	8/21/2018 1:49:00 PM									
				<b>Location</b>	BG-07									
				<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:			%	26.1									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.284	J	M-	0.0831	0.0831	0.268	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	9.86			0.0348	0.0348	0.134	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	73.6			0.0764	0.0764	1.34	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	1.37			0.0101	0.0101	0.134	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	1.57	J	RL	1.02	1.02	10.7	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.0717	J	RL	0.0228	0.0228	0.134	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	2190			12.0	12.0	67.0	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	21.5			0.0885	0.0885	0.268	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	3.28			0.0111	0.0111	0.0670	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	16.1			0.151	0.151	0.268	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	15.6			0.0469	0.0469	0.134	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	6.43	J	M+	0.370	0.370	0.670	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG		U*	BL	1.31	1.31	1.31	N	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	16.7			0.0818	0.0818	0.134	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.507	J	M-,RL	0.0804	0.0804	0.670	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0192	J	RL	0.0188	0.0188	0.134	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.319			0.0174	0.0174	0.134	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	38.0			0.0818	0.0818	0.134	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	45.0			0.448	0.448	0.670	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG	0.0564	J	RL	0.0396	0.0396	0.132	Y	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	5.1			0.1	0.1	0.1	Y	Yes	1	WET
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		9.54	9.54	13.6	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG		UR	M-	1.09	1.09	1.36	N	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG		U*	BE,BF,BL,M-,RL	13.3	13.3	13.6	N	Yes	1	DRY

					Lab Sample ID	490-157829-4								
					Sys Sample Code	CUF-BS-BG07-15.5/17.5-20180821								
					Sample Name	CUF-BS-BG07-15.5/17.5-20180821								
					Sample Date	8/21/2018 2:25:00 PM								
					Location	BG-07								
					Sample Type	N								
					Parent Sample									
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:			%	26.3									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.238	J	M-,RL	0.0801	0.0801	0.258	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	7.94			0.0336	0.0336	0.129	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	88.0			0.0736	0.0736	1.29	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	2.82			0.00969	0.00969	0.129	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	1.89	J	RL	0.986	0.986	10.3	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.0854	J	RL	0.0220	0.0220	0.129	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	3870			11.6	11.6	64.6	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	18.4			0.0853	0.0853	0.258	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	18.7			0.0107	0.0107	0.0646	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	15.7			0.146	0.146	0.258	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	12.7			0.0452	0.0452	0.129	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	11.7	J	M+	0.357	0.357	0.646	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG		U*	BL	0.924	0.924	0.924	N	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	22.1			0.0788	0.0788	0.129	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.799	J	M-	0.0775	0.0775	0.646	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG		U		0.0181	0.0181	0.129	N	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.313			0.0168	0.0168	0.129	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	30.5			0.0788	0.0788	0.129	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	48.7			0.432	0.432	0.646	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG	0.0578	J	RL	0.0393	0.0393	0.131	Y	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	6.9			0.1	0.1	0.1	Y	Yes	1	WET
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		9.39	9.39	13.4	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG		U*	BF,BL,M-	1.73	1.73	1.73	N	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG		U*	BE,BF,BL,M-,RL	9.04	9.04	13.4	N	Yes	1	DRY

					Lab Sample ID	490-157829-5								
					Sys Sample Code	CUF-BS-BG07-0/0.66-20180821								
					Sample Name	CUF-BS-BG07-0/0.66-20180821								
					Sample Date	8/21/2018 2:13:00 PM								
					Location	BG-07								
					Sample Type	N								
					Parent Sample									
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:			%	22.1									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.218	J	M-,RL	0.0796	0.0796	0.257	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	4.93			0.0334	0.0334	0.128	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	56.4			0.0732	0.0732	1.28	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.554			0.00963	0.00963	0.128	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	1.72	J	RL	0.979	0.979	10.3	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.0825	J	RL	0.0218	0.0218	0.128	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	846			11.5	11.5	64.2	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	14.8			0.0847	0.0847	0.257	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	7.05			0.0107	0.0107	0.0642	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	12.2			0.145	0.145	0.257	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	12.7			0.0449	0.0449	0.128	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	5.22	J	M+	0.354	0.354	0.642	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG		U*	BL	0.740	0.740	0.740	N	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	8.28			0.0783	0.0783	0.128	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.549	J	M-,RL	0.0770	0.0770	0.642	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0239	J	RL	0.0180	0.0180	0.128	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.138			0.0167	0.0167	0.128	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	23.1			0.0783	0.0783	0.128	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	30.5			0.429	0.429	0.642	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG		U		0.0374	0.0374	0.125	N	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	5.2			0.1	0.1	0.1	Y	Yes	1	WET
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		8.97	8.97	12.8	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG		U*	BF,BL,M-,RL	1.22	1.22	1.28	N	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG		U*	BE,BF,BL,M-	14.4	14.4	14.4	N	Yes	1	DRY

	<b>Lab Sample ID</b>	490-157829-6												
	<b>Sys Sample Code</b>	CUF-BS-FB01-20180821												
	<b>Sample Name</b>	CUF-BS-FB01-20180821												
	<b>Sample Date</b>	8/21/2018 2:55:00 PM												
	<b>Location</b>													
	<b>Sample Type</b>	FB												
	<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
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	0.144	J	RL	0.116	0.116	0.500	Y	Yes	1	NA
	Chromium	7440-47-3	T	MG/L	0.00153	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	0.000994	J	RL	0.000899	0.000899	0.00100	Y	Yes	1	NA
	Zinc	7440-66-6	T	MG/L	0.00606			0.00242	0.00242	0.00500	Y	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	0.200	J	RL	0.200	0.200	1.00	Y	Yes	1	NA
	Fluoride	16984-48-8	N	MG/L	0.0360	J	RL	0.0100	0.0100	0.100	Y	Yes	1	NA
	Sulfate	14808-79-8	N	MG/L	0.445	J	RL	0.0300	0.0300	1.00	Y	Yes	1	NA

### **SECTION 3**

#### **SUPPORTING DOCUMENTATION FOR QUALIFIERS**

**INORGANIC ANALYSIS SUPPORT DOCUMENTATION**

ESI project name: TVA  
 Sample Collection Dates: 8/21/2018  
 Job Number: 20188111.A000  
 Project Manager: Jen Gable  
 Laboratory: TestAmerica

Reviewed by: KEM 2/11/2019  
 Approved by: AP  
 Completion Date: 2/20/19

Applicable Sample No's ( / )

Refer to Table 1 in the Quality Assurance Review

		<u>Sample No.</u>	<u>Lab Control No.</u>
Deliverable:	CLP (Full) ( )	SDG: 490-157829-1/-2	
Level IV (Full)	(X)		
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			
	Metals	Mercury	Anions	pH/Moisture	Metals	Mercury	Anions	pH/Moisture	Metals	Mercury	Anions	pH/Moisture
Holding Times	X	X	X	X					X	X	X	X
Blank Analysis Results	X	X	X		X				X	X	X	
Matrix Spike (Predigestion) Results	X		X		X		X		X		X	
Duplicate Analysis: ( ) Field (X) Lab				X								X
Quantitation 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	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	X								X			
ICP Interference Checks												
ICP Serial Dilutions	X								X			
ICP Post-Digestion Spike	X								X			
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	X	X	X	X					X	X	X	X
Others:												

Comments:

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## BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

Matrix (Aq., S.)	Blank Type						Contaminant	Concentration	Qualification limit (5x)
	Method	ICB	CCB	Prep.	Trip	Equip	Field		
Aq	X	CUF-BS-FB01-20190821	CCBs	Chloride	0.200	mg/L	1	Fluoride	0.0360
								Sulfate	0.445
								Calcium	0.144
								Chromium	0.00153
								Vanadium	0.000994
								Zinc	0.00606
Aq	X	CUF-BS-EB01-20180823	CCBs	Chloride	0.3479	mg/L	1.7395	Fluoride	0.03303
								Sulfate	0.4426
								Molybdenum	2.992
A	X	CUF-BS-EB02-20180827	Chloride	0.270	mg/L	1.35	Sulfate	0.434	2.17
								Calcium	0.147
								Chromium	0.00122
Aq	X	CUF-BS-EB02-20180827	Chloride	0.303	mg/L	1.515	Sulfate	0.436	2.18
								Calcium	0.130
								Chromium	0.00164
								Vanadium	0.000981
									0.004905

Aq = Aqueous; S = Solid    \*\* Column J contains a formula

Notes: \_\_\_\_\_

3-IN  
INSTRUMENT BLANKS  
METALS

Lab Name: TestAmerica Pittsburgh

Job No.: 490-157829-2

SDG No.:

Concentration Units: ug/L

Analyte	RL	ICB 180-265229/6		CCB1 180-265229/11		CCB2 180-265229/23		CCB3 180-265229/35	
		12/10/2018	16:30	12/10/2018	16:54	12/10/2018	18:00	12/10/2018	19:05
		Found	C	Found	C	Found	C	Found	C
<b>Antimony</b>	2.00	ND		ND		ND		ND	
<b>Arsenic</b>	1.00	ND		ND	✓	ND		ND	
<b>Barium</b>	10.0	ND		ND		ND	✓	ND	
<b>Beryllium</b>	1.00	ND		ND		ND		ND	✓
<b>Boron</b>	80.0	ND		ND		ND		ND	
<b>Cadmium</b>	1.00	ND		ND		ND		ND	
<b>Calcium</b>	500	ND	✓	ND		ND		ND	
<b>Chromium</b>	2.00	ND		ND	✓	ND		ND	
<b>Cobalt</b>	0.500	ND		ND		ND	✓	ND	
<b>Copper</b>	2.00	ND		ND		ND		ND	✓
<b>Lead</b>	1.00	ND		ND		ND		ND	
<b>Lithium</b>	5.00	ND		ND		ND		ND	
<b>Molybdenum</b>	5.00	ND	✓	* 2.992 ✓ J		ND		ND	
<b>Nickel</b>	1.00	ND		ND	✓	ND		ND	
<b>Selenium</b>	5.00	ND		ND		ND	✓	ND	
<b>Silver</b>	1.00	ND		ND		ND		ND	✓
<b>Thallium</b>	1.00	ND		ND		ND		ND	
<b>Vanadium</b>	1.00	ND		ND		ND		ND	
<b>Zinc</b>	5.00	ND	✓	ND		ND		ND	

\* Sample is thought to be flagged (C) water blank

Italicized analytes were not requested for this sequence.

5A-IN  
MATRIX SPIKE SAMPLE RECOVERY  
METALS

Client ID: CUF-BS-BG07-0/0.66-20180821 MS

Lab ID: 490-157829-5 MS

Lab Name: TestAmerica Pittsburgh

Job No.: 490-157829-2

SDG No.:

Matrix: Solid

Concentration Units: mg/Kg

% Solids: 77.9

75-125%

Analyte	SSR	C	Sample Result (SR)	C	Spike Added (SA)	%R ✓	Control Limit %R	Q	Method
Antimony	46.03 ✓		0.218	J	65.5	(2) 70 ✓	75-125	F1	EPA 6020A
Arsenic	9.346		4.93		5.24	84	75-125		EPA 6020A
Barium	310.9		56.4		262	97	75-125		EPA 6020A
Beryllium	6.784		0.554		6.55	95	75-125		EPA 6020A
Boron	116.8		1.72	J	131	88	75-125		EPA 6020A
Cadmium	5.908		0.0825	J	6.55	89	75-125		EPA 6020A
Calcium	6484 ✓		846		6550	86 ✓	75-125		EPA 6020A
Chromium	39.05		14.8		26.2	92	75-125		EPA 6020A
Cobalt	61.67		7.05		65.5	83	75-125		EPA 6020A
Copper	37.36		12.2		32.7	77	75-125		EPA 6020A
Lead	17.78		12.7		2.62	(1) 196 ✓	75-125	4	EPA 6020A
Lithium	17.03		5.22		6.55	(3) 180 ✓	75-125	F1	EPA 6020A
Molybdenum	128.9 ✓		0.740		131	98 ✓	75-125		EPA 6020A
Nickel	62.01		8.28		65.5	82	75-125		EPA 6020A
Selenium	1.524		0.549	J	1.31	(2) 74 ✓	75-125	F1	EPA 6020A
Silver	6.183		0.0239	J	6.55	94	75-125		EPA 6020A
Thallium	5.731		0.138		6.55	85	75-125		EPA 6020A
Vanadium	78.11		23.1		65.5	84	75-125		EPA 6020A
Zinc	88.19 ✓		30.5		65.5	88 ✓	75-125		EPA 6020A

SSR = Spiked Sample Result

① Sample result > 4x spike - no qual.

② All associated samples flagged J (reason code: M-)

③ All associated samples flagged J (reason code: M+)

Calculations are performed before rounding to avoid round-off errors in calculated results.  
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM VA - IN

5A-IN  
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY  
METALS

Client ID: CUF-BS-BG07-0/0.66-20180821 MSD

Lab ID: 490-157829-5 MSD

Lab Name: TestAmerica Pittsburgh

Job No.: 490-157829-2

SDG No.:

Matrix: Solid

Concentration Units: mg/Kg

% Solids: 77.9

75-125% <35%

Analyte	(SDR)	Spike Added (SA)	%R ✓	Control Limit %R	RPD	RPD Limit	Q	Method
	C							
Antimony	42.44	62.3	68	75-125	8	20	F1	EPA 6020A
Arsenic	10.59	4.98	113	75-125	12	20		EPA 6020A
Barium	297.6	249	97	75-125	4	20		EPA 6020A
Beryllium	6.307	6.23	93	75-125	6	20		EPA 6020A
Boron	107.0	125	85	75-125	9	20		EPA 6020A
Cadmium	5.599	6.23	89	75-125	5	20		EPA 6020A
Calcium	6285	6230	87	75-125	3	20		EPA 6020A
Chromium	43.49	24.9	115	75-125	11	20		EPA 6020A
Cobalt	62.71	62.3	89	75-125	2	20		EPA 6020A
Copper	36.60	31.2	78	75-125	2	20		EPA 6020A
Lead	19.75	2.49	1285	75-125	10	20	4	EPA 6020A
Lithium	16.60	6.23	183	75-125	3	20	F1	EPA 6020A
Molybdenum	121.1	125	97	75-125	6	20		EPA 6020A
Nickel	61.21	62.3	85	75-125	1	20		EPA 6020A
Selenium	1.549	1.25	80	75-125	2	20		EPA 6020A
Silver	5.782	6.23	92	75-125	7	20		EPA 6020A
Thallium	5.529	6.23	87	75-125	4	20		EPA 6020A
Vanadium	43.01	62.3	96	75-125	6	20		EPA 6020A
Zinc	91.15	62.3	97	75-125	3	20		EPA 6020A

SDR = Sample Duplicate Result

- ① Sample result >4x spike - no qual.
- ② All associated samples flagged T (reason code: M-)
- ③ All associated samples flagged T (reason code: M+)

Calculations are performed before rounding to avoid round-off errors in calculated results.  
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM VD - IN

FORM III  
HPLC/IC MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Nashville

Job No.: 490-157829-1

SDG No.:

Matrix: Solid (Soluble) Level: Low

Lab File ID: 082918IC9\_049dat-Conductivity

Lab ID: 490-157829-1 MS

Client ID: CUF-BS-BG07-1.5/3.5-20180821 MS

74-125-7

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONCENTRATION (mg/Kg)	MS CONCENTRATION (mg/Kg)	MS % REC	QC LIMITS	# REC
Chloride	116	ND	103.8 ✓	90	80-120	
Fluoride	11.6	ND	1.448 ✓	13	80-120	F1
Sulfate	116	46.3	123.9 ✓	67	80-120	F1

Chloride, Fluoride, Sulfate, Sample vs. Spiked (Test Results Only)

Chloride, Fluoride, Sulfate, Spiked Matrix (Test Results Only)

# Column to be used to flag recovery and RPD values

FORM III 9056A

FORM III  
HPLC/IC MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Nashville

Job No.: 490-157829-1

SDG No.:

Matrix: Solid (Soluble) Level: Low

Lab File ID: 082918IC9\_050dat-Conductivity

Lab ID: 490-157829-1 MSD

Client ID: CUF-BS-BG07-1.5/3.5-20180821 MS

COMPOUND	SPIKE ADDED (mg/Kg)	MSD CONCENTRATION (mg/Kg)	MSD REC	% ✓	%	QC LIMITS			#
						RPD	RPD	REC	
Chloride	116	112.3	97	8	20	80-120			
Fluoride	11.6	1.483	13	2	20	80-120		F1	
Sulfate	116	132.4	74	7	20	80-120			F1

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# Column to be used to flag recovery and RPD values

FORM III 9056A

# Client Sample Results

Client: Environmental Standards Inc.  
Project/Site: CUF\_BS\_20180821\_1A

TestAmerica Job ID: 490-157829-1

**Client Sample ID: CUF-BS-FB01-20180821**

**Lab Sample ID: 490-157829-6**

Date Collected: 08/21/18 14:55

Matrix: Water

Date Received: 08/21/18 20:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	U*-2	0.200 J B	1.00	0.200	mg/L			08/23/18 12:24	1
Fluoride	U*-4-5	0.0360 J B	0.100	0.0100	mg/L			08/23/18 12:24	1
Sulfate	U*-3,-4,-5	0.445 J B	1.00	0.0300	mg/L			08/23/18 12:24	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 21:24	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 10:49	1
Arsenic	ND		0.00100	0.000323	mg/L		12/07/18 13:06	12/08/18 10:49	1
Barium	ND		0.0100	0.000373	mg/L		12/07/18 13:06	12/08/18 10:49	1
Beryllium	ND		0.00100	0.0000570	mg/L		12/07/18 13:06	12/08/18 10:49	1
Boron	ND		0.0800	0.0303	mg/L		12/07/18 13:06	12/08/18 10:49	1
Cadmium	ND		0.00100	0.000125	mg/L		12/07/18 13:06	12/08/18 10:49	1
Calcium	* 0.144 J		0.500	0.116	mg/L		12/07/18 13:06	12/08/18 10:49	1
Chromium	* 0.00153 J		0.00200	0.000631	mg/L		12/07/18 13:06	12/08/18 10:49	1
Cobalt	ND		0.000500	0.0000750	mg/L		12/07/18 13:06	12/08/18 10:49	1
Copper	ND		0.00200	0.00130	mg/L		12/07/18 13:06	12/08/18 10:49	1
Lead	ND		0.00100	0.0000940	mg/L		12/07/18 13:06	12/08/18 10:49	1
Lithium	ND		0.00500	0.00256	mg/L		12/07/18 13:06	12/08/18 10:49	1
Molybdenum	ND		0.00500	0.000474	mg/L		12/07/18 13:06	12/08/18 10:49	1
Nickel	ND		0.00100	0.000312	mg/L		12/07/18 13:06	12/08/18 10:49	1
Selenium	ND		0.00500	0.000813	mg/L		12/07/18 13:06	12/08/18 10:49	1
Silver	ND		0.00100	0.000121	mg/L		12/07/18 13:06	12/08/18 10:49	1
Thallium	ND		0.00100	0.0000630	mg/L		12/07/18 13:06	12/08/18 10:49	1
Vanadium	* 0.000994 J		0.00100	0.000899	mg/L		12/07/18 13:06	12/08/18 10:49	1
Zinc	* 0.00606		0.00500	0.00242	mg/L		12/07/18 13:06	12/08/18 10:49	1

\* 20% blank & 5% blank conc = no spec  
 metal

TestAmerica Nashville

## 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**

Date Collected: 08/23/18 11:13

Matrix: Water

Date Received: 08/23/18 19:54

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.270	JB	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	JB	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

All results shown above come from the sample  
 metals

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

**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	J	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.: 490-157829-1  
 SDG No.:  
 Client Sample ID:  
 Matrix: Solid  
 Analysis Method: 9056A  
 Extraction Method:  
 Sample wt/vol: 10 (mL)  
 Con. Extract Vol.:  
 Injection Volume: 1 (uL)  
 % Moisture:  
 Analysis Batch No.: 539644  
 Lab Sample ID: CCB 490-539644/3  
 Lab File ID: 082918IC9\_044dat-Conductivity.  
 Date Collected:  
 Date Extracted:  
 Date Analyzed: 08/29/2018 18:24  
 Dilution Factor: 1  
 GC Column: Metrohm ASupp4 ID: 4 (mm)  
 GPC Cleanup: (Y/N) N  
 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
16887-00-6	Chloride	<u>0.3479</u>	J	1.00	0.200
16984-48-8	Fluoride	<u>0.03303</u>	J	0.100	0.0100
14808-79-8	Sulfate	<u>0.4426</u>	J	1.00	0.0300

AP 2/11/17

FORM I  
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Nashville Job No.: 490-157829-1  
 SDG No.:  
 Client Sample ID:  
 Matrix: Solid  
 Analysis Method: 9056A  
 Extraction Method:  
 Sample wt/vol: 10 (mL)  
 Con. Extract Vol.:  
 Injection Volume: 1 (uL)  
 % Moisture:  
 Analysis Batch No.: 539644  
 Lab Sample ID: CCB 490-539644/20  
 Lab File ID: 082918IC9\_061dat-Conductivity.  
 Date Collected:  
 Date Extracted:  
 Date Analyzed: 08/29/2018 21:41  
 Dilution Factor: 1  
 GC Column: Metrohm ASupp4 ID: 4 (mm)  
 GPC Cleanup: (Y/N) N  
 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
16887-00-6	Chloride	U-2	0.2960 J	1.00	0.200
16984-48-8	Fluoride		ND	0.100	0.0100
14808-79-8	Sulfate	U-3,4,-5	0.4391 J	1.00	0.0300

*AP 2/21/18*

*AP 2/21/18*

*AP 2/21/18*

## HPLC/IC ANALYSIS RUN LOG

Lab Name: TestAmerica Nashville Job No.: 490-157829-1

SDG No.:

Instrument ID: IC9 Start Date: 08/29/2018 18:12

Analysis Batch Number: 539644 End Date: 08/29/2018 23:14

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVRT 490-539644/2		08/29/2018 18:12 ✓	1	082918IC9_043da t-Conductivity. d	Metrohm ASupp4 4 (mm)
CCB 490-539644/3		08/29/2018 18:24 ✓	1	082918IC9_044da t-Conductivity. d	Metrohm ASupp4 4 (mm)
MB 490-539364/1-A		08/29/2018 18:36 ✓	1	082918IC9_045da t-Conductivity. d	Metrohm ASupp4 4 (mm)
LCS 490-539364/2-A		08/29/2018 18:47 ✓	1	082918IC9_046da t-Conductivity. d	Metrohm ASupp4 4 (mm)
LCSD 490-539364/3-A		08/29/2018 18:59 ✓	1	082918IC9_047da t-Conductivity. d	Metrohm ASupp4 4 (mm)
490-157829-1 ✓		08/29/2018 19:10 ✓	1	082918IC9_048da t-Conductivity. d	Metrohm ASupp4 4 (mm)
490-157829-1 MS		08/29/2018 19:22 ✓	1	082918IC9_049da t-Conductivity. d	Metrohm ASupp4 4 (mm)
490-157829-1 MSD		08/29/2018 19:34 ✓	1	082918IC9_050da t-Conductivity. d	Metrohm ASupp4 4 (mm)
490-157829-2		08/29/2018 19:45 ✓	1	082918IC9_051da t-Conductivity. d	Metrohm ASupp4 4 (mm)
490-157829-3 ✓		08/29/2018 19:57 ✓	1	082918IC9_052da t-Conductivity. d	Metrohm ASupp4 4 (mm)
490-157829-4 ✓		08/29/2018 20:08 ✓	1	082918IC9_053da t-Conductivity. d	Metrohm ASupp4 4 (mm)
490-157829-5 ✓		08/29/2018 20:20 ✓	1	082918IC9_054da t-Conductivity. d	Metrohm ASupp4 4 (mm)
CCV 490-539644/19		08/29/2018 21:30 ✓	1	082918IC9_060da t-Conductivity. d	Metrohm ASupp4 4 (mm)
CCB 490-539644/20		08/29/2018 21:41 ✓	1	082918IC9_061da t-Conductivity. d	Metrohm ASupp4 4 (mm)
ZZZZZ		08/29/2018 21:53 ✓	1		Metrohm ASupp4 4 (mm)
ZZZZZ		08/29/2018 22:04 ✓	1		Metrohm ASupp4 4 (mm)
ZZZZZ		08/29/2018 22:16 ✓	1		Metrohm ASupp4 4 (mm)
ZZZZZ		08/29/2018 22:28 ✓	1		Metrohm ASupp4 4 (mm)
ZZZZZ		08/29/2018 22:39 ✓	1		Metrohm ASupp4 4 (mm)
ZZZZZ		08/29/2018 22:51 ✓	1		Metrohm ASupp4 4 (mm)
CCV 490-539644/27		08/29/2018 23:02 ✓	1		Metrohm ASupp4 4 (mm)
CCB 490-539644/28		08/29/2018 23:14 ✓	1		Metrohm ASupp4 4 (mm)

## **SECTION 4**

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

## Sample Summary

Client: Environmental Standards Inc.  
Project/Site: CUF\_BS\_20180821\_1A

TestAmerica Job ID: 490-157829-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-157829-1	CUF-BS-BG07-1.5/3.5-20180821	Solid	08/21/18 13:06	08/21/18 20:00
490-157829-2	CUF-BS-BG07-6.1/8.1-20180821	Solid	08/21/18 13:34	08/21/18 20:00
490-157829-3	CUF-BS-BG07-11.6/13.6-20180821	Solid	08/21/18 13:49	08/21/18 20:00
490-157829-4	CUF-BS-BG07-15.5/17.5-20180821	Solid	08/21/18 14:25	08/21/18 20:00
490-157829-5	CUF-BS-BG07-0/0.66-20180821	Solid	08/21/18 14:13	08/21/18 20:00
490-157829-6	CUF-BS-FB01-20180821	Water	08/21/18 14:55	08/21/18 20:00

**Job Narrative  
490-157829-1**

**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 490-157829-2.

**Receipt**

The samples were received on 8/21/2018 8:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 4.8° C and 5.2° C.

**HPLC/IC**

Method(s) 9056A: The method blank for analytical batch 490-538270 contained Sulfate above the method detection limit. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and re-analysis of samples was not performed.

Method(s) 9056A: The method blank for analytical batch 490-538270 contained Chloride, Fluoride and Sulfate above the method detection limit. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and re-analysis of samples was not performed.

Method(s) 9056, 9056A: Due to the nature of the sample matrix, a matrix spike / matrix spike duplicate (MS/MSD) was not analyzed with 490-538270. However, the laboratory control sample / laboratory control sample duplicate (LCS/LCSD) recoveries were within the acceptance limits.

Method(s) 9056A: The method blank for analytical batch 490-539644 contained Chloride, Fluoride and Sulfate above the method detection limit. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and re-analysis of samples was not performed.

Method(s) 9056A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 490-539364 and analytical batch 490-539644 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

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

**Metals**

Method(s) 6020A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for 264944 were outside control limits for lithium, antimony, and selenium. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or 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  
490-157829-2**

**Comments**

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

**Metals**

Method(s) 6020A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for 264944 were outside control limits for lithium, antimony, and selenium. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

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



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	
COC No:	CUF_BS_20180821_1A		
1	of	2	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:	B.Bolder/W.Pedgett							
Lab Address:	29360 Foster Creighton Dr Nashville, TN 37204	Project #:	17758209			Sampling Company:	Stantec							
		Site Address:	815 Cumberland City Road Cumberland City, TN 37763			Address:	Warehouse Row North 1110 Market Street, Suite 214A Chattanooga TN							
		City:				City/State:	(423) 619-8010							
Lab Manager Contact Information:			Site PM Name: Roy Quinn			Sampling Team Number: 1								
Lab PM:	Gail Laga	Phone/Fax:	423-751-3753			Bend EDD/Hard Copy to:	tva-dl2@prod1.tva.gov							
Phone/Fax:	615-301-5741/615-726-3404	Site PM Email:				Analysis Turnaround Time								
Lab Email:	Gail.Laga@TestAmericaInc.com					CALENDAR DAYS	WORKING DAYS	TAT is different from below						
						<input type="checkbox"/> 24 Hours	<input type="checkbox"/>							
						<input type="checkbox"/> 3 Business Days	<input type="checkbox"/>							
						<input checked="" type="checkbox"/> 4 Business Days	<input type="checkbox"/>							
						<input type="checkbox"/> 10 Business Days (Standard)	<input type="checkbox"/>							
#	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	DEPTH Start Depth	DEPTH End Depth	MATRIX CODE	G= GRAB C= COMP	SAMPLER NAME	SAMPLE DATE	SAMPLE TIME	SOIL CONTAMINANT	Comments/ Lab Sample I.D.	DISPOSE		
1	CUF-BS-BG07-1.5/3.5-20180821	BG-07	1.5	3.5	S	G	N	8/21/2018	1306	2		<input type="checkbox"/>		
2	CUF-BS-BG07-6.1/8.1-20180821	BG-07	6.1	8.1	S	G	N	8/21/2018	1334	2		<input type="checkbox"/>		
3	CUF-BS-BG07-11.6/13.6-20180821	BG-07	11.6	13.6	S	G	N	8/21/2018	1349	2		<input type="checkbox"/>		
4	CUF-BS-BG07-15.5/17.5-20180821	BG-07	15.5	17.5	S	G	N	8/21/2018	1425	2		<input type="checkbox"/>		
5	CUF-BS-BG07-0.0/0.66-20180821	BG-07	0	0.66	S	G	N	8/21/2018	1413	2		<input type="checkbox"/>		
6	CUF-BS-FB01-20180821	BG-07	NA	NA	W	G	FB	8/21/2018	1455	2		<input type="checkbox"/>		
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&lt;2

no custody seals or FB

RELINQUISHED BY / AFFILIATION		DATE	TIME	ACCEPTED BY / AFFILIATION		DATE	TIME	Sample Receipt Conditions			
B.Bolder	<i>B.Bolder</i>	8/21/2018	1700	-	-	-	-	<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							
Carrier: <i>SG</i>				Samuel Bolder <i>SG</i>							
				Temperature: <i>20°C</i>							
				Sample Date: <i>8/21/2018</i>							
				Time Date: <i>1700</i>							

## 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

<b>Client Information (Sub Contract Lab)</b>		Sampler:	Lab PM: Lage, Gall
Client Contact: Shipping/Receiving		Phone:	E-Mail: gail.lage@testamericanlnc.com
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): <b>Tennessee</b>	
Address: 301 Alpha Drive, RIDC Park, City: Pittsburgh State, Zip: PA, 15238 Phone: 412-963-7058(Tel) 412-963-2468(Fax) Email:		Due Date Requested: 12/12/2018	TAT Requested (days):
Project Name: CUF_BS_20180821_1A		Project #: 49014071	WO #:
Site:		SSOW#:	

## Sample Identification - Client ID (Lab ID)

	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (w-water, g-glass, o-ocean, a-air)	Preservation Pipe	Preservation Method (GOM) 85000-00209	Refrigerated Samples Yes or No	Total Number of Samples	Requisitioned by
CUF-BS-BG07-1.5/3.5-20180821 (490-157829-1)	8/21/18	13:06 Central	Solid		X			1	TVA - container labeled 490-157831-1
CUF-BS-BG07-6.1/8.1-20180821 (490-157829-2)	8/21/18	13:34 Central	Solid		X			1	TVA - container labeled 490-157831-2
CUF-BS-BG07-11.6/13.6-20180821 (490-157829-3)	8/21/18	13:49 Central	Solid		X			1	TVA - container labeled 490-157831-3
CUF-BS-BG07-15.5/17.5-20180821 (490-157829-4)	8/21/18	14:25 Central	Solid		X			1	TVA - container labeled 490-157831-4
CUF-BS-BG07-0/0.66-20180821 (490-157829-5)	8/21/18	14:13 Central	Solid		X			1	TVA - container labeled 490-157831-5

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & 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

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: *Munderhiser*Date/Time: *12-6-18/1630*Company: *TAFL*Received by: *SLW*Date/Time: *12/7/18 1000*Company: *TAFL*

Relinquished by:

Date/Time:

Company:

Received by:

Date/Time:

Company:

Custody Seals Intact:  
A Yes A NoCustody Seal No.: 

Cooler Temperature(s) °C and Other Remarks:

OC No: 190-83340.1
Page: Page 1 of 1
Job #: 490-157829-2
Preservation Codes:
A - HCl   M - Hexane B - NaOH   N - None C - Zn Acetate   O - AsNaO2 D - Nitric Acid   P - Na2O4S E - NaHSO4   Q - Na2SO3 F - MeOH   R - Na2SO3 G - Amchlor   S - H2SO4 H - Ascorbic Acid   T - TSP Dodecahydrate I - Ice   U - Acetone J - DI Water   V - MCAA K - EDTA   W - pH 4-5 L - EDA   Z - other (specify) Other:

## Special Instructions/Note:



THE LEADER IN ENVIRONMENTAL TESTING  
Nashville, TN

## COOLER RECEIPT FORM



490-157829 Chain of Custody

Cooler Received/Opened On 08-21-2018 @ 2000

Time Samples Removed From Cooler \_\_\_\_\_ Time Samples Placed In Storage \_\_\_\_\_ (2 Hour Window)

1. Tracking # NIA (last 4 digits, FedEx) Courier: Client

IR Gun ID 17960358 pH Strip Lot \_\_\_\_\_ Chlorine Strip Lot \_\_\_\_\_

2. Temperature of rep. sample or temp blank when opened: 5.2 Degrees Celsius

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

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

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 (initial) EZA

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 # EA

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

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) EA

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) EA

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

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

## COOLER RECEIPT FORM

Cooler Received/Opened On 08-21-2018 @ 2000

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 17960358 pH Strip Lot \_\_\_\_\_ Chlorine Strip Lot \_\_\_\_\_

2. Temperature of rep. sample or temp blank when opened: 4.8 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? Front 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 (initial) EZ

7. Were custody seals on containers: YES NO 8-22-18 E&J and Intact YES...NO...NA 8-22-18 E&J

Were these signed and dated correctly?

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 # N/A

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

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) EZ

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) EZ

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

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



Tennessee Valley Authority

### TVA Environmental Investigations

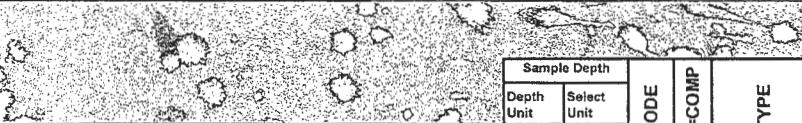
#### Chain-of-Custody / Analytical Request Document

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

COOLER No.:		of	<u>2</u>
COC No.:	CUF_BS 20180821 1A		
1 of 2 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:	S.Bolden/W.Padgett	
Lab Address:	29380 Foster Creighton Dr Nashville, TN 37204	Project #:	177563209		Sampling Company:	Stantec	
		Site Address:	815 Cumberland City Road	City	Address	Warehouse Row North 1110 Market Street, Suite 214A	
			Cumberland City	State, Zip:	City/State	Chattanooga TN	Phone: (859) 619-8010
Lab Manager Contact Information		Site PM Name:	Roy Quinn				
Lab PM:	Gail Lage	Phone/Fax:	423-751-3753				
Phone/Fax:	615-301-5741/615-726-3404	Site PM Email:	irquinn@tva.gov				
Lab Email:	Gail.Lage@testamericainc.com		Sampling Team Number:	Send EDD/Hard Copy to: tva-sl@envsld.com			

Loc: 490	<b>157829</b>	
Filled	N	N
Preserve	None	None
Analyze	CUF_BS_CUFBGNDSOIL	CUF_BS_CUFBGNDSOIL
Comments	sox comments	
MS/MSD	None	
Sample Receipt Conditions	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/> No	
Temperature in °C		
Sample on Ice?		
Sample Intact?		
Tip Blank?		

			Sample Depth		SAMPLE TYPE	Analysis Turnaround Time			
			Depth Unit	Select Unit		<input type="checkbox"/> CALENDAR DAYS	<input checked="" type="checkbox"/> WORKING DAYS	TAT if different from Below _____	
# SWL	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Start Depth	End Depth	MATRIX CODE G= GRAB C=COMP	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.
	1	CUF-BS-BG07-1.5/3.5-20180821	BG-07	1.5	3.5	S G N	8/21/2018	1306	2
2	CUF-BS-BG07-6.1/8.105-20180821	BG-07	6.1	8	S G N	8/21/2018	1334	2	<input type="checkbox"/>
3	CUF-BS-BG07-11.6/13.6-20180821	BG-07	11.6	13.6	S G N	8/21/2018	1349	2	<input type="checkbox"/>
4	CUF-BS-BG07-15.5/17.5-20180821	BG-07	15.5	17.5	S G N	8/21/2018	1425	2	<input type="checkbox"/>
5	CUF-BS-BG07-0/0.66-20180821	BG-07	0	0.66	S G N	8/21/2018	1413	2	<input type="checkbox"/>
6	CUF-BS-FB01-20180821	BG-07	NA	NA	W G FB	8/21/2018	1455	2	<input type="checkbox"/>
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/ HNO<sub>3</sub> to pH<2

No custody seal for FB

RELINQUISHED BY / AFFILIATION		DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Sample Receipt Conditions			
S.Bolden <i>S.Bolden</i>		8/21/2018	1700	<i>Elliott James</i>	8/21/2018	2000	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
							<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
							<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
							<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
							<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
							<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
SHIPPING METHOD:		SAMPLER NAME AND SIGNATURE								
Counter		<i>Susan Bolden Bolden</i>								

5.2, 4.8



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.:	2	of	2
COC No.:	CUF_BS 20180821_1A		
2 of 2 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:	S.Bolden/W.Padgett													
Lab Address:	29360 Foster Creighton Dr Nashville, TN 37204	Project #:	177568209			Sampling Company:	Stantec													
		Site Address:	815 Cumberland City Road			Address:	Warehouse Row North 1110 Market Street, Suite 214A													
		City:	Cumberland City	State, Zip:	TN, 37753	City/State:	Chattanooga TN	Phone:	(859) 619-8010											
Lab Manager Contact Information		Site PM Name:	Roy Quinn																	
Lab PM:	Gail Lage	Phone/Fax:	423-751-3753			Sampling Team Number:														
Phone/Fax:	615-301-5741/615-726-3404	Site PM Email:	irquinn@tva.gov			Send EDD/Hard Copy to:	tva-el@envstd.com													
Lab Email:	Gail.Lage@testamericainc.com																			
Analysis Turnaround Time																				
					<input type="checkbox"/> CALENDAR DAYS	<input checked="" type="checkbox"/> WORKING DAYS														
					TAT if different from Below															
					<input type="checkbox"/> 24 Hours	<input type="checkbox"/> 3 Business Days	<input type="checkbox"/> 5 Business Days	<input type="checkbox"/> 10 Business Days (Standard)												
ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Start Depth	End Depth	MATRIX CODE G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Preserve	Analysis	CUF_BACKGROUNDSoil	CUF_BACKGROUNDSoil_BLANKS	CUF_BACKGROUNDSoil_PH	CUF_BACKGROUNDSoil_CD			
1	CUF-BS-BG07-1.5/3.5-20180821	BG-07	1.5	3.5	S	G	N	8/21/2018	1306	2	<input type="checkbox"/>	X	X							
2	CUF-BS-BG07-6.1/8.105-20180821	BG-07	6.1	8	S	G	N	8/21/2018	1334	2	<input type="checkbox"/>	X	X							
3	CUF-BS-BG07-11.6/13.6-20180821	BG-07	11.6	13.6	S	G	N	8/21/2018	1349	2	<input type="checkbox"/>	X	X							
4	CUF-BS-BG07-15.5/17.5-20180821	BG-07	15.5	17.5	S	G	N	8/21/2018	1425	2	<input type="checkbox"/>	X	X							
5	CUF-BS-BG07-0/0.66-20180821	BG-07	0	0.66	S	G	N	8/21/2018	1413	2	<input type="checkbox"/>	X	X							
6	CUF-BS-FB01-20180821	BG-07	NA	NA	W	G	FB	8/21/2018	1455	2	<input type="checkbox"/>	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:										RELINQUISHED BY / AFFILIATION		DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Sample Receipt Conditions			
Additional volume collected should be used for MS/MSDs.										S.Bolden <i>S. Bolden</i>		8/21/2018	1100	<i>Lynn Adams 8/21/2018 2000</i>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CUF_BACKGROUNDSoil: Perform MS/MSD on sample identified above																	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CUF_BACKGROUNDSoil_BLANKS: Anions - unpreserved; Metals - preserved w/ HNO <sub>3</sub> to pH<2																	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No custody seals to FB										SHIPPING METHOD: <i>canister</i>		SAMPLER NAME AND SIGNATURE: <i>Suzanne Bolden</i>				Temperature in °C	Sample on Ice?	Sample Intact?	Trip Blank?	

5.2, 4.8

SAMPLE RECEIVING  
TESTAMERICA, INC.  
13719 RIDER TRAIL NORTH  
EARTH CITY, MO 63045  
UNITED STATES US

ACTWT: 36.50 LB  
CRD: 486221/CAFE3211

BILL RECIPIENT

TO TEST AMERICA PITTSBURGH  
TEST AMERICA PITTSBURGH  
301 ALPHA DRIVE  
RIDC PARK  
PITTSBURGH PA 15238

(412) 963-7059

TRK# 0201

DEPT#

REF#

DEPT#

FedEx Express



1 of 5  
TRK# 0201 7048 6527 8235  
## MA8TER ##

FRI - 07 DEC 10:30A MDA  
PRIORITY OVERNIGHT HT

15238 88  
PA-US PIT HT

NA AGCA

Uncorrected temp  
Thermometer ID

12.1 / 12.9 °C

10

CF 0.2 Initials TS

PT-WI-SR-001 effective 7/26/13

SAMPLE RECEIVING  
TESTAMERICA, INC.  
13719 RIDER TRAIL NORTH

EARTH CITY, MO 63045  
UNITED STATES US

ACTWT: 36.50 LB  
CRD: 486221/CAFE3211

TO TEST AMERICA PITTSBURGH  
TEST AMERICA PITTSBURGH  
301 ALPHA DRIVE  
RIDC PARK  
PITTSBURGH PA 15238

(412) 963-7059

TRK# 0201

DEPT#

REF#

490-158029 Waybill

490-157991 Waybill

490-157892 Waybill

490-157829 Waybill

490-158137 Waybill

2 of 5  
MPS# 0263 7048 6527 8246  
Metr# 7048 6527 6235

0201

NA AGCA

Uncorrected temp 9.1 / 9.3 °C  
Thermometer ID 10

CF 0.2 Initials TS

T-WI-SR-001 effective 7/26/13

SAMPLE RECEIVING  
TESTAMERICA, INC.  
13715 RIDER TRAIL NORTH  
EARTH CITY, MO 63045  
UNITED STATES US

ACTWT: 38.50 LB  
CAD: 486221/CAFE3211

BILL RECIPIENT

To TEST AMERICA PITTSBURGH  
TEST AMERICA PITTSBURGH  
301 ALPHA DRIVE  
RIDC PARK  
PITTSBURGH PA 15238

(412) 983-7059  
INTL  
PDT

DEPT:

DEPT:



3 of 5  
MPN# 0263 7048 6527 8257  
Metr# 7048 6527 8285

FRI - 07 DEC 10:30A  
PRIORITY OVERNIGHT

15238  
PA-US PIT

NA AGCA

Uncorrected temp  
Thermometer ID  
10.2 / 10.4 °C  
10

CF 0.2 Initials B

TWI-SR-001 effective 7/26/13

SAMPLE RECEIVING  
TESTAMERICA, INC.  
13715 RIDER TRAIL NORTH  
EARTH CITY, MO 63045  
UNITED STATES US

ACTWT: 38.50 LB  
CAD: 486221/CAFE3211

BILL RECIPIENT

To TEST AMERICA PITTSBURGH  
TEST AMERICA PITTSBURGH  
301 ALPHA DRIVE  
RIDC PARK  
PITTSBURGH PA 15238

(412) 983-7059  
INTL  
PDT

DEPT:

DEPT:

4 of 5

FRI - 07 DEC 10:30A

FedEx  
MPN# 0263 7048 6527 8268

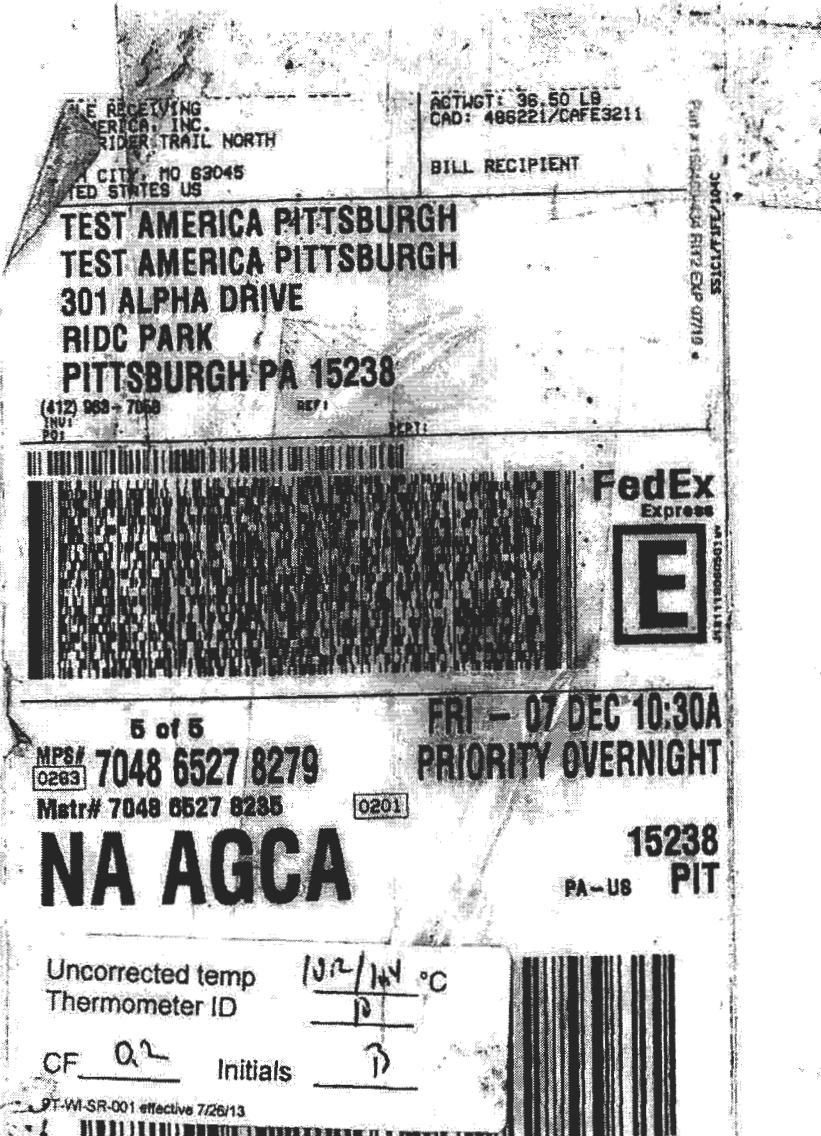
FRI - 07 DEC 10:30A  
PRIORITY OVERNIGHT

15238  
PA-US  
PIT

NA AGCA

Uncorrected temp  
Thermometer ID  
9.3 / 9.5 °C  
10

FID 36  
CF 0.2 Initials B  
TWI-SR-001 effective 7/26/13



**SECTION 5**

**PROJECT CORRESPONDENCE**

## **Andrew Piasecki**

---

**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

---

**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)



# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

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**

---

**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]

---

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  
**Environmental Standards, Inc.**  
1140 Valley Forge Road • PO Box 810 • Valley Forge, PA 19482  
610.935.5577 ext. 433 • [www.envstd.com](http://www.envstd.com) • [apiasecki@envstd.com](mailto:apiasecki@envstd.com)

**Emergency Response Quality Assurance Hotline: 855.374.7272**



---

**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  
THE LEADER IN ENVIRONMENTAL TESTING

2960 Foster Creighton Drive  
Nashville, TN 37204  
Tel 615-301-5741 | Fax 615-726-3404  
[www.testamericainc.com](http://www.testamericainc.com)

---

**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-

---

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  
**Environmental Standards, Inc.**  
1140 Valley Forge Road • PO Box 810 • Valley Forge, PA 19482  
610.935.5577 ext. 433 • [www.envstd.com](http://www.envstd.com) • [apiasecki@envstd.com](mailto:apiasecki@envstd.com)

**Emergency Response Quality Assurance Hotline: 855.374.7272**



## Andrew Piasecki

---

**From:** Lage, Gail <Gail.Lage@testamericainc.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?

Job ID	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

**GAIL A LAGE**  
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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

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**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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**Emergency Response Quality Assurance Hotline: 855.374.7272**



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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 <[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

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  
**Environmental Standards, Inc.**  
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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

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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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