

**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 6 background soil samples and two aqueous blanks collected on August 27, 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 490-158137-1 and 490-158137-2.

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

Sample Identification	Laboratory Sample Identification	Job Number(s)	Matrix	Date Sample Collected	Parameter(s) Examined
CUF-BS-FB05-20180827 (Field Blank)	490-158137-1	490-158137-1 490-158137-2	Aq	8/27/18	A, Hg M
CUF-BS-BG01-0.0/0.5-20180827	490-158137-2	490-158137-1 490-158137-2	Soil	8/27/18	A, Hg, pH M
CUF-BS-BG01-1.0/3.0-20180827	490-158137-3	490-158137-1 490-158137-2	Soil	8/27/18	A, Hg, pH M
CUF-BS-BG01-6.5/8.5-20180827	490-158137-4	490-158137-1 490-158137-2	Soil	8/27/18	A, Hg, pH M
CUF-BS-BG01-11.5/13.5-20180827	490-158137-5	490-158137-1 490-158137-2	Soil	8/27/18	A, Hg, pH M
CUF-BS-BG01-16.5/18.5-20180827	490-158137-6	490-158137-1 490-158137-2	Soil	8/27/18	A, Hg, pH M
CUF-BS-BG01-21.5/23.5-20180827	490-158137-7	490-158137-1 490-158137-2	Soil	8/27/18	A, Hg, pH M
CUF-BS-EB02-20180827 (Equipment Blank)	490-158137-8	490-158137-1 490-158137-2	Aq	8/27/18	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	Sample(s)	Validation Qualifier(s)	Reason(s) for Qualification
sulfate	490-158137-1	All samples except CUF-BS-FB05-20180827, CUF-BS-BG01-21.5/23.5-20180827, and CUF-BS-EB02-20180827	U*	BE, BF
antimony, selenium, and vanadium	490-158137-2	All samples except CUF-BS-FB05-20180827 and CUF-BS-EB02-20180827	J	M-
lithium	490-158137-2	All samples except CUF-BS-FB05-20180827 and CUF-BS-EB02-20180827	J	M+

Analyte(s)	Job Number	Sample(s)	Validation Qualifier(s)	Reason(s) for Qualification
calcium, chromium, cobalt, copper, nickel, vanadium, and zinc	490-158137-2	CUF-BS-BG01-0.0/0.5-20180827	J	I
selenium	490-158137-2	CUF-BS-BG01-21.5/23.5-20180827	J	ZZ

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)

Review performed by: Kristen L. Ferguson, Quality Assurance Chemist
Review reviewed by: Amanda J. Cover, Senior Quality Assurance Chemist/Data Validation Task Manager
Review approved by: Andrew L. Piasecki, Senior Quality Assurance Chemist
Review approved by: Rock J. Vitale, CEAC, Technical Director of Chemistry/Principal
Date review completed: 2/25/19



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

Reason Code	Explanation
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.

Lab Sample ID	490-158137-1
Sys Sample Code	CUF-BS-FB05-20180827
Sample Name	CUF-BS-FB05-20180827
Sample Date	8/27/2018 12:31:00 PM
Location	
Sample Type	FB
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
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	0.124	J	RL	0.116	0.116	0.500	Y	Yes	1	NA
	Chromium	7440-47-3	T	MG/L	0.00157	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	0.253	J	RL	0.200	0.200	1.00	Y	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	0.436	J	RL	0.0300	0.0300	1.00	Y	Yes	1	NA

Lab Sample ID	490-158137-2
Sys Sample Code	CUF-BS-BG01-0.0/0.5-20180827
Sample Name	CUF-BS-BG01-0.0/0.5-20180827
Sample Date	8/27/2018 1:12:00 PM
Location	BG-01
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:			%	19.2									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.816	J	M-	0.0767	0.0767	0.248	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	16.3			0.0322	0.0322	0.124	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	85.4			0.0706	0.0706	1.24	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.708			0.00928	0.00928	0.124	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	1.72	J	RL	0.944	0.944	9.90	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.218			0.0210	0.0210	0.124	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	1880	J	I	11.1	11.1	61.9	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	31.1	J	I	0.0817	0.0817	0.248	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	10.8	J	I	0.0103	0.0103	0.0619	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	17.3	J	I	0.140	0.140	0.248	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	15.5			0.0433	0.0433	0.124	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	2.89	J	M+	0.342	0.342	0.619	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	10.2			0.0767	0.0767	0.619	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	14.0	J	I	0.0755	0.0755	0.124	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.449	J	M-,RL	0.0743	0.0743	0.619	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.139			0.0173	0.0173	0.124	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.258			0.0161	0.0161	0.124	Y	Yes	1	DRY
Vanadium	7440-62-2	T	MG/KG	40.7	J	I,M-	0.0755	0.0755	0.124	Y	Yes	1	DRY	
Zinc	7440-66-6	T	MG/KG	43.8	J	I	0.413	0.413	0.619	Y	Yes	1	DRY	
SW-846 7471B	Mercury	7439-97-6	T	MG/KG	0.0634	J	RL	0.0363	0.0363	0.121	Y	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	6.2			0.1	0.1	0.1	Y	Yes	1	WET
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		8.60	8.60	12.3	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG	1.65			0.982	0.982	1.23	Y	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG		U*	BE,BF	12.6	12.6	12.6	N	Yes	1	DRY

Lab Sample ID	490-158137-3
Sys Sample Code	CUF-BS-BG01-1.0/3.0-20180827
Sample Name	CUF-BS-BG01-1.0/3.0-20180827
Sample Date	8/27/2018 1:59:00 PM
Location	BG-01
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:			%	15.3									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	1.86	J	M-	0.0711	0.0711	0.229	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	58.6			0.0298	0.0298	0.115	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	37.9			0.0654	0.0654	1.15	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.703			0.00860	0.00860	0.115	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	4.32	J	RL	0.875	0.875	9.17	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.141			0.0195	0.0195	0.115	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	1030			10.3	10.3	57.3	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	30.6			0.0757	0.0757	0.229	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	2.10			0.00952	0.00952	0.0573	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	54.1			0.130	0.130	0.229	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	13.0			0.0401	0.0401	0.115	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	3.63	J	M+	0.316	0.316	0.573	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	66.1			0.0711	0.0711	0.573	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	12.0			0.0699	0.0699	0.115	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	1.02	J	M-	0.0688	0.0688	0.573	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0531	J	RL	0.0161	0.0161	0.115	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.577			0.0149	0.0149	0.115	Y	Yes	1	DRY
Vanadium	7440-62-2	T	MG/KG	60.6	J	M-	0.0699	0.0699	0.115	Y	Yes	1	DRY	
Zinc	7440-66-6	T	MG/KG	24.7			0.383	0.383	0.573	Y	Yes	1	DRY	
SW-846 7471B	Mercury	7439-97-6	T	MG/KG	0.0927	J	RL	0.0340	0.0340	0.113	Y	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	6.0			0.1	0.1	0.1	Y	Yes	1	WET
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		8.18	8.18	11.7	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG		U		0.935	0.935	1.17	N	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG		U*	BE,BF	18.8	18.8	18.8	N	Yes	1	DRY

Lab Sample ID	490-158137-4
Sys Sample Code	CUF-BS-BG01-6.5/8.5-20180827
Sample Name	CUF-BS-BG01-6.5/8.5-20180827
Sample Date	8/27/2018 2:19:00 PM
Location	BG-01
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:			%	18.1									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	6.19	J	M-	0.0721	0.0721	0.232	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	77.2			0.0302	0.0302	0.116	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	36.0			0.0663	0.0663	1.16	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.560			0.00872	0.00872	0.116	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	6.24	J	RL	0.887	0.887	9.30	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.204			0.0198	0.0198	0.116	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	312			10.4	10.4	58.1	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	15.4			0.0767	0.0767	0.232	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	0.548			0.00965	0.00965	0.0581	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	117			0.131	0.131	0.232	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	43.3			0.0407	0.0407	0.116	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	1.98	J	M+	0.321	0.321	0.581	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	172			0.0721	0.0721	0.581	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	3.07			0.0709	0.0709	0.116	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	1.27	J	M-	0.0697	0.0697	0.581	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0694	J	RL	0.0163	0.0163	0.116	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.468			0.0151	0.0151	0.116	Y	Yes	1	DRY
Vanadium	7440-62-2	T	MG/KG	80.2	J	M-	0.0709	0.0709	0.116	Y	Yes	1	DRY	
Zinc	7440-66-6	T	MG/KG	11.1			0.388	0.388	0.581	Y	Yes	1	DRY	
SW-846 7471B	Mercury	7439-97-6	T	MG/KG	0.213			0.0353	0.0353	0.118	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		8.56	8.56	12.2	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG		U		0.979	0.979	1.22	N	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG		U*	BE,BF,RL	9.39	9.39	12.2	N	Yes	1	DRY

Lab Sample ID	490-158137-5
Sys Sample Code	CUF-BS-BG01-11.5/13.5-20180827
Sample Name	CUF-BS-BG01-11.5/13.5-20180827
Sample Date	8/27/2018 2:45:00 PM
Location	BG-01
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:			%	20.7									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	1.36	J	M-	0.0782	0.0782	0.252	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	12.5			0.0328	0.0328	0.126	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	42.7			0.0719	0.0719	1.26	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.462			0.00946	0.00946	0.126	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	7.16	J	RL	0.962	0.962	10.1	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.171			0.0214	0.0214	0.126	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	265			11.3	11.3	63.0	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	11.7			0.0832	0.0832	0.252	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	0.621			0.0105	0.0105	0.0630	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	92.0			0.142	0.142	0.252	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	11.2			0.0441	0.0441	0.126	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	2.07	J	M+	0.348	0.348	0.630	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	17.9			0.0782	0.0782	0.630	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	4.50			0.0769	0.0769	0.126	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.492	J	M-,RL	0.0757	0.0757	0.630	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0714	J	RL	0.0177	0.0177	0.126	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.748			0.0164	0.0164	0.126	Y	Yes	1	DRY
Vanadium	7440-62-2	T	MG/KG	35.6	J	M-	0.0769	0.0769	0.126	Y	Yes	1	DRY	
Zinc	7440-66-6	T	MG/KG	9.66			0.421	0.421	0.630	Y	Yes	1	DRY	
SW-846 7471B	Mercury	7439-97-6	T	MG/KG	0.0764	J	RL	0.0381	0.0381	0.127	Y	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	5.0			0.1	0.1	0.1	Y	Yes	1	WET
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		8.89	8.89	12.7	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG		U		1.02	1.02	1.27	N	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG		U*	BE,BF,RL	9.26	9.26	12.7	N	Yes	1	DRY

Lab Sample ID	490-158137-6
Sys Sample Code	CUF-BS-BG01-16.5/18.5-20180827
Sample Name	CUF-BS-BG01-16.5/18.5-20180827
Sample Date	8/27/2018 3:05:00 PM
Location	BG-01
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:			%	21.8									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	2.53	J	M-	0.0826	0.0826	0.266	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	39.9			0.0346	0.0346	0.133	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	271			0.0759	0.0759	1.33	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	1.15			0.00999	0.00999	0.133	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	3.90	J	RL	1.02	1.02	10.7	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.217			0.0226	0.0226	0.133	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	415			11.9	11.9	66.6	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	17.0			0.0879	0.0879	0.266	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	1.84			0.0111	0.0111	0.0666	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	189			0.150	0.150	0.266	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	41.5			0.0466	0.0466	0.133	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	3.03	J	M+	0.368	0.368	0.666	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	54.0			0.0826	0.0826	0.666	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	12.0			0.0812	0.0812	0.133	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	1.31	J	M-	0.0799	0.0799	0.666	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.148			0.0186	0.0186	0.133	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	1.38			0.0173	0.0173	0.133	Y	Yes	1	DRY
Vanadium	7440-62-2	T	MG/KG	119	J	M-	0.0812	0.0812	0.133	Y	Yes	1	DRY	
Zinc	7440-66-6	T	MG/KG	23.8			0.445	0.445	0.666	Y	Yes	1	DRY	
SW-846 7471B	Mercury	7439-97-6	T	MG/KG	0.0989	J	RL	0.0374	0.0374	0.125	Y	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		8.93	8.93	12.8	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG		U		1.02	1.02	1.28	N	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG		U*	BE,BF,RL	7.77	7.77	12.8	N	Yes	1	DRY

Lab Sample ID	490-158137-7
Sys Sample Code	CUF-BS-BG01-21.5/23.5-20180827
Sample Name	CUF-BS-BG01-21.5/23.5-20180827
Sample Date	8/27/2018 3:25:00 PM
Location	BG-01
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:			%	24.3									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	1.52	J	M-	0.0844	0.0844	0.272	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	22.3			0.0354	0.0354	0.136	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	40.2			0.0776	0.0776	1.36	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.851			0.0102	0.0102	0.136	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	5.75	J	RL	1.04	1.04	10.9	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.345			0.0231	0.0231	0.136	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	395			12.2	12.2	68.1	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	12.7			0.0898	0.0898	0.272	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	6.06			0.0113	0.0113	0.0681	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	139			0.154	0.154	0.272	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	18.9			0.0476	0.0476	0.136	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	2.89	J	M+	0.376	0.376	0.681	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	28.4			0.0844	0.0844	0.681	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	33.3			0.0830	0.0830	0.136	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.842	J	M-,ZZ	0.0817	0.0817	0.681	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0852	J	RL	0.0191	0.0191	0.136	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	1.98			0.0177	0.0177	0.136	Y	Yes	1	DRY
Vanadium	7440-62-2	T	MG/KG	60.8	J	M-	0.0830	0.0830	0.136	Y	Yes	1	DRY	
Zinc	7440-66-6	T	MG/KG	45.4			0.455	0.455	0.681	Y	Yes	1	DRY	
SW-846 7471B	Mercury	7439-97-6	T	MG/KG	0.163			0.0388	0.0388	0.129	Y	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	4.6			0.1	0.1	0.1	Y	Yes	1	WET
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		9.31	9.31	13.3	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG		U		1.06	1.06	1.33	N	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG	107			7.98	7.98	13.3	Y	Yes	1	DRY

Lab Sample ID	490-158137-8
Sys Sample Code	CUF-BS-EB02-20180827
Sample Name	CUF-BS-EB02-20180827
Sample Date	8/27/2018 3:55:00 PM
Location	
Sample Type	EB
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
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	0.130	J	RL	0.116	0.116	0.500	Y	Yes	1	NA
	Chromium	7440-47-3	T	MG/L	0.00164	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	0.000981	J	RL	0.000899	0.000899	0.00100	Y	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	0.303	J	RL	0.200	0.200	1.00	Y	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	0.436	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: 2018 CUF EI
 Sample Collection Dates: 8/27/18
 Job Number: 20188111.A000
 Project Manager: AJC
 Laboratory: TA Nashville
 TA Pittsburgh

Reviewed by: Kristen Ferguson
 Approved by: *AJC*
 Completion Date: *2/19*

Applicable Sample No's () Refer to Table 1 in the Quality Assurance Review

Deliverable:	CLP (Full) ()	<u>Sample No.</u>	<u>Lab Control No.</u>
	Level IV (Full) (x)	460-158137-1-8	
	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/7471B	9056A	9045D	6020A	7470A/7471B	9056A	9045D	6020A	7470/7471B	9056A	9045D
Holding Times	X	X	X	X				X	X	X	X	
Blank Analysis Results	X	X	X					X	X	X		
Matrix Spike (Predigestion) Results	X	X	X		X				X	X	X	
Duplicate Analysis: () Field (x) Lab				X								X
Quantitation of Results												
Detection Limit/Sensitivity												
Initial Calibrations	X	X	X	X					X	X	X	X
Continuing Calibrations	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							X	X		
ICP Post-Digestion Spike	X	X							X	X		
GFAA Post Digestion Spikes												
GFAA Duplicate Injections												
ICP Multiple Exposures	X				X				X			
GFAA Standard Additions												
CRDL Standards												
Condition on Receipt	X	X	X	X					X	X	X	X
Percent Solids	X	X	X						X	X	X	
Others: Internal Standard Relative Intensity	X				X				X			

Comments: *Data acceptable unless otherwise qualified*



BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

Matrix (Aq., S.)	Blank Type						Blank Sample Number	Contaminant	Concentration mg/L	Qualification limit (5x)
	Method									
	ICB	CCB	Prep.	Trip	Equip	Field				
Aq					X		CUF-BS-EB02-20180827	chloride	0.303 ✓	1.515
								sulfate	0.436 ✓	2.18
									(ug/L)	
								calcium	130	650
								chromium	1.64	8.2
								vanadium	0.981	4.905
✓ Aq					X		CUF-BS-EB01-20180823	chloride	0.27 ✓	1.35
								sulfate	0.434 ✓	2.17
									(ug/L)	
								calcium	147	735
								chromium	1.22	6.1
									(ug/L)	
Aq						X	CUF-BS-FB05-20180827	calcium	124	620
								chromium	1.57	7.85
								chloride	0.253 ✓	1.265
								sulfate	0.436 ✓	2.18
									(mg/kg)	
✗ S			X				MB 180-264947/1-A	nickel	0.0691	0.3455
								zinc	0.3496	1.748
✓ Aq			X				MB 490-539643/3	chloride	0.3023 ✓	1.5115
								sulfate	0.4435 ✓	2.2175
									(ug/L)	
✗ Aq		X					CCB 180-265026	barium	0.87	4.35
								beryllium	0.063	0.315
								lead	0.146	0.73
								molybdenum	0.959	4.795
								nickel	0.968	4.84

Aq = Aqueous; S = Solid

Notes: All units mg/L unless specified

→ samples: 490-158137-148

Client Sample Results

Client: Environmental Standards Inc.
 Project/Site: CUF_BS_20180827_1A

TestAmerica Job ID: 490-158137-1

FB

Client Sample ID: CUF-BS-FB05-20180827

Lab Sample ID: 490-158137-1

Date Collected: 08/27/18 12:31

Matrix: Water

Date Received: 08/27/18 19:00

Method: 9056A - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.253	J B	1.00	0.200	mg/L			08/29/18 16:51	1
Fluoride	ND		0.100	0.0100	mg/L			08/29/18 16:51	1
Sulfate	0.436	J B	1.00	0.0300	mg/L			08/29/18 16:51	1

no qual

*U**

-2, -3, -4, -5, -6

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 21:03	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 11:12	1
Arsenic	ND		0.00100	0.000323	mg/L		12/07/18 13:06	12/08/18 11:12	1
Barium	ND		0.0100	0.000373	mg/L		12/07/18 13:06	12/08/18 11:12	1
Beryllium	ND		0.00100	0.0000570	mg/L		12/07/18 13:06	12/08/18 11:12	1
Boron	ND		0.0800	0.0303	mg/L		12/07/18 13:06	12/08/18 11:12	1
Cadmium	ND		0.00100	0.000125	mg/L		12/07/18 13:06	12/08/18 11:12	1
Calcium	0.124	J	0.500	0.116	mg/L		12/07/18 13:06	12/08/18 11:12	1
Chromium	0.00157	J	0.00200	0.000631	mg/L		12/07/18 13:06	12/08/18 11:12	1
Cobalt	ND		0.000500	0.0000750	mg/L		12/07/18 13:06	12/08/18 11:12	1
Copper	ND		0.00200	0.00130	mg/L		12/07/18 13:06	12/08/18 11:12	1
Lead	ND		0.00100	0.0000940	mg/L		12/07/18 13:06	12/08/18 11:12	1
Lithium	ND		0.00500	0.00256	mg/L		12/07/18 13:06	12/08/18 11:12	1
Molybdenum	ND		0.00500	0.000474	mg/L		12/07/18 13:06	12/08/18 11:12	1
Nickel	ND		0.00100	0.000312	mg/L		12/07/18 13:06	12/08/18 11:12	1
Selenium	ND		0.00500	0.000813	mg/L		12/07/18 13:06	12/08/18 11:12	1
Silver	ND		0.00100	0.000121	mg/L		12/07/18 13:06	12/08/18 11:12	1
Thallium	ND		0.00100	0.0000630	mg/L		12/07/18 13:06	12/08/18 11:12	1
Vanadium	ND		0.00100	0.000899	mg/L		12/07/18 13:06	12/08/18 11:12	1
Zinc	ND		0.00500	0.00242	mg/L		12/07/18 13:06	12/08/18 11:12	1

no qual

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20180827_1A

EB

TestAmerica Job ID: 490-158137-1

Client Sample ID: CUF-BS-EB02-20180827

Lab Sample ID: 490-158137-8

Date Collected: 08/27/18 15:55

Matrix: Water

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

no qual

U
-2, -3, -4, -5, -6*

no qual

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12

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

doR: 60-125

Lab Name: TestAmerica Pittsburgh

Job No.: 490-158137-2

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
STDI 180-265026/2 IC	18:12	100	100	100	100	100
STDI 180-265026/3 IC	18:19	106	105	99	93	95
STDI 180-265026/4 IC	18:24	101	104	98	98	99
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	109	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	93	93	95	94
CCV 180-265026/34	20:51	98	78	78	77	76
CCB3 180-265026/35	20:56	91	76	74	76	74
MB 180-264947/1-A	21:23	78	68	74	79	76
LCS 180-264947/2-A	21:28	84	80	75	76	72
CCV 180-265026/46	21:55	74	64	69	70	69
CCB4 180-265026/47	22:00	82	74	73	75	73
490-158137-2	22:32	74	53		67	66
490-158137-3	22:37	76	62		74	71
490-158137-4	22:41	73	63		74	72
490-158137-5	22:46	77	71		81	77
CCV 180-265026/58	22:54	76	67	69	69	69
CCB5 180-265026/59	22:59	76	71	65	66	65
490-158137-6	23:04	88	98		63	62
490-158137-7	23:08	72	66		73	71
490-158137-7 SD	23:13	69	61	73	71	69
490-158137-7 MS	23:18	79	70		67	65
490-158137-7 MSD	23:22	74	65		64	62
490-158137-7 PDS	23:27	64	55		55	54
CCV 180-265026/70	23:54	50	43	46	47	48
CCB6 180-265026/71	23:59	59	49	49	50	51
CCVL 180-265026/72	00:08	59	48	48	50	50

QC
no
qual

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

non-target

all + + flag "J"

5A-IN
 MATRIX SPIKE SAMPLE RECOVERY
 METALS

QOR: 75-125

Client ID: CUF-BS-BG01-21.5/23.5-20180827 M

Lab ID: 490-158137-7 MS

Lab Name: TestAmerica Pittsburgh

Job No.: 490-158137-2

SDG No.:

Matrix: Solid

Concentration Units: mg/Kg

% Solids: 75.7

Analyte	SSR	Sample Result (SR) C	Spike Added (SA) C	%R	Control Limit %R	Q	Method
Antimony	43.17	1.52	62.9	↓ 66	75-125	F1	EPA 6020A
* Arsenic	16.28	22.3	5.03	↓ -120	75-125	4	EPA 6020A
Barium	243.9	40.2	251	81	75-125		EPA 6020A
Beryllium	6.149	0.851	6.29	84	75-125		EPA 6020A
Boron	115.8	5.75 J	126	88	75-125		EPA 6020A
Cadmium	6.076	0.345	6.29	91	75-125		EPA 6020A
Calcium	5565	395	6290	82 ✓	75-125		EPA 6020A
Chromium	40.20	12.7	25.1	109	75-125		EPA 6020A
Cobalt	63.93	6.06	62.9	92	75-125		EPA 6020A
* Copper	122.2	139	31.4	↓ -54	75-125	4	EPA 6020A
* Lead	18.75	18.9	2.51	↓ -8	75-125	4	EPA 6020A
Lithium	10.60	2.89	6.29	123	75-125		EPA 6020A
Molybdenum	131.6	28.4	126	82	75-125		EPA 6020A
Nickel	91.55	33.3	62.9	93 ✓	75-125		EPA 6020A
Selenium	1.445	0.842	1.26	↓ 48	75-125	F1	EPA 6020A
Silver	5.970	0.0852 J	6.29	94	75-125		EPA 6020A
Thallium	7.251	1.98	6.29	84	75-125		EPA 6020A
Vanadium	96.62	60.8	62.9	↓ 57	75-125	F1	EPA 6020A
Zinc	99.21	45.4	62.9	86	75-125		EPA 6020A

SSR = Spiked Sample Result

✓
 Samples: 490-158137-2-7

*initial sample
 result > 4x
 spike amt : no qual

%R ↓: Antimony, Selenium, Vanadium
 all sample results + → flag "J"

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

5A-IN
 MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
 METALS

%R: 75-125
 RPD 435

Client ID: CUF-BS-BG01-21.5/23.5-20180827 M

Lab ID: 490-158137-7 MSD

Lab Name: TestAmerica Pittsburgh

Job No.: 490-158137-2

SDG No.:

Matrix: Solid

Concentration Units: mg/Kg

% Solids: 75.7

Analyte	(SDR)	Spike Added (SA)	%R	Control Limit %R	RPD	RPD Limit	Q	Method
Antimony	41.94	63.5	↓ 64	75-125	3	20	F1	EPA 6020A
* Arsenic	20.40	5.08	↓ -37	75-125	22	20	4	EPA 6020A
Barium	253.4	254	84	75-125	4	20		EPA 6020A
Beryllium	6.137	6.35	83	75-125	0	20		EPA 6020A
Boron	103.8	127	77	75-125	11	20		EPA 6020A
Cadmium	6.187	6.35	92	75-125	2	20		EPA 6020A
Calcium	5371	6350	78 ✓	75-125	4 ✓	20		EPA 6020A
Chromium	40.64	25.4	110	75-125	1	20		EPA 6020A
Cobalt	64.22	63.5	92	75-125	0	20		EPA 6020A
* Copper	134.3	31.7	↓ -15	75-125	9	20	4	EPA 6020A
* Lead	21.56	2.54	103	75-125	14	20	4	EPA 6020A
Lithium	11.45	6.35	↑ 135	75-125	8	20	F1	EPA 6020A
Molybdenum	139.4	127	87	75-125	6	20		EPA 6020A
Nickel	92.72	63.5	94 ✓	75-125	1 ✓	20		EPA 6020A
Selenium	1.602	1.27	↓ 60	75-125	10	20	F1	EPA 6020A
Silver	5.889	6.35	91	75-125	1	20		EPA 6020A
Thallium	7.274	6.35	83	75-125	0	20		EPA 6020A
Vanadium	111.0	63.5	79	75-125	14	20		EPA 6020A
Zinc	100.6	63.5	87	75-125	1	20		EPA 6020A

SDR = Sample Duplicate Result

✓ ✓
 samples: 490-158137-2-7

* initial sample result > 4x
 spike amt. ∴ no equal

%R ↓: Antimony + Selenium
 all sample results + → flag "J"

%R ↑: Lithium
 all sample results + → flag "J"

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

490-158137-C-7-A 12/8/2018 11:08:55 PM

User Pre-dilution: 1.000

Run	Time	6Li	7Li	9Be	10B	11B	13C	23Na	25Mg
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:08:02	72.333%	21.260	6.721	40.250	39.400	0.000	228.700	2903.000
2	23:08:10	71.412%	21.710	5.602	41.660	44.090	0.000	233.600	2829.000
3	23:08:18	72.275%	20.710	6.424	40.070	43.270	0.000	224.300	2868.000
x		72.007%	21.230	6.249	40.660	42.250	0.000	228.800	2866.000
σ		0.516%	0.499	0.580	0.869	2.502	0.000	4.653	37.260
%RSD		0.716	2.351	9.273	2.137	5.922	0.000	2.033	1.300
Run	Time	26Mg	27Al	28Si	37Cl	39K	43Ca	44Ca	45Sc
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:08:02	2895.000	157800.000	5951.000	0.000	10770.000	3107.000	2899.000	65.056%
2	23:08:10	2873.000	156200.000	6001.000	0.000	10750.000	2682.000	2962.000	65.731%
3	23:08:18	2949.000	155500.000	5978.000	0.000	11060.000	2776.000	2849.000	65.967%
x		2906.000	156500.000	5977.000	0.000	10860.000	2855.000	2903.000	65.585%
σ		38.770	1169.000	24.730	0.000	170.900	222.900	56.480	0.472%
%RSD		1.334	0.747	0.414	0.000	1.574	7.808	1.945	0.720
Run	Time	47Ti	51V	52Cr	55Mn	56Fe	57Fe	59Co	60Ni
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:08:02	368.900	442.700	91.740	505.500	364700.000	351200.000	43.930	238.200
2	23:08:10	356.300	447.300	95.130	501.500	367000.000	353400.000	44.650	251.800
3	23:08:18	330.700	450.500	93.050	501.900	373500.000	358700.000	45.080	243.800
x		352.000	446.800	93.310	503.000	368400.000	354400.000	44.550	244.600
σ		19.490	3.935	1.712	2.240	4581.000	3821.000	0.578	6.848
%RSD		5.537	0.881	1.834	0.445	1.243	1.078	1.298	2.800
Run	Time	63Cu	65Cu	66Zn	68Zn	75As	78Se	82Se	83Kr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:08:02	1010.000	1030.000	330.700	298.000	160.900	4.849	5.526	0.000
2	23:08:10	1004.000	1021.000	333.900	320.100	164.900	8.080	3.952	0.000
3	23:08:18	988.400	1013.000	336.200	313.800	165.700	5.631	11.510	0.000
x		1001.000	1022.000	333.600	310.600	163.800	6.186	6.995	0.000
σ		11.120	8.432	2.776	11.380	2.598	1.686	3.985	0.000
%RSD		1.111	0.825	0.832	3.663	1.586	27.250	56.970	0.000
Run	Time	88Sr	89Y	95Mo	98Mo	103Rh	107Ag	109Ag	111Cd
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:08:02	77.000	0.000	208.900	207.900	71.240%	0.658	0.481	2.784
2	23:08:10	82.200	0.000	209.800	206.000	72.947%	0.588	0.578	2.105
3	23:08:18	81.300	0.000	208.900	211.200	74.527%	0.633	0.434	2.712
x		80.170	0.000	209.200	208.400	72.905%	0.626	0.498	2.534
σ		2.778	0.000	0.507	2.614	1.644%	0.036	0.074	0.373
%RSD		3.465	0.000	0.242	1.254	2.255	5.683	14.840	14.720
Run	Time	114Cd	115In	118Sn	121Sb	123Sb	135Ba	137Ba	159Tb
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:08:02	1.591	68.641%	43.840	11.510	12.310	295.000	298.300	83.557%
2	23:08:10	1.557	70.877%	45.150	10.500	11.120	293.500	291.700	86.289%
3	23:08:18	1.436	72.304%	45.210	11.440	11.180	281.000	295.800	87.588%
x		1.528	70.608%	44.730	11.150	11.540	289.800	295.300	85.811%
σ		0.082	1.846%	0.773	0.564	0.668	7.694	3.328	2.058%
%RSD		5.342	2.615	1.728	5.053	5.791	2.655	1.127	2.398
Run	Time	203Tl	205Tl	206Pb	207Pb	208Pb	209Bi		
		ppb	ppb	ppb	ppb	ppb	ppb		
1	23:08:02	14.830	14.490	155.500	133.400	139.600	73.964%		
2	23:08:10	14.800	14.590	154.900	132.700	139.000	75.791%		
3	23:08:18	14.570	14.470	155.000	132.700	139.000	76.605%		
x		14.730	14.520	155.100	132.900	139.200	75.454%		
σ		0.143	0.063	0.298	0.383	0.307	1.352%		
%RSD		0.968	0.433	0.192	0.288	0.220	1.792		

Result
70L
"J"

SECTION 4

CASE NARRATIVE AND CHAIN-OF-CUSTODY RECORD

Job Narrative
490-158137-1

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 490-158137-2 ✓

Receipt

The samples were received on 8/27/2018 7:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.7° C, 2.5° C and 3.3° C. ✓

HPLC/IC

Method(s) 9056A: The method blank for analytical batch 490-539643 contained Chloride 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. ✓

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 264947 were outside control limits for several analytes. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. ✓

Organic Prep

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

COOLER RECEIPT FORM



490-158137 Chain of Custody

Cooler Received/Opened On 8/29/2018@ 1900

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

1. Tracking # 1119 (last 4 digits, FedEx) Courier: _____
IR Gun ID_31470368 _____ pH Strip Lot _____ Chlorine Strip Lot _____

2. Temperature of rep. sample or temp blank when opened: 2.5 Degrees Celsius

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

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

If yes, how many and where: 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) EIA

7. Were custody seals on containers: YES NO 8-28-18 EIA and intact YES...NO... NA

Were these signed and dated correctly? YES...NO... NA 8-28-18 EIA

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



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

I certify that I unloaded the cooler and answered questions 7-14 (Initial) EIA

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) EIA

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) EIA

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

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

BIS = Broken in shipment
Cooler Receipt Form.doc

COOLER RECEIPT FORM

Cooler Received/Opened On 8/28/2018 @ 1900

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

1. Tracking # NA (last 4 digits, FedEx) Courier: _____
IR Gun ID_31470368 _____ pH Strip Lot _____ Chlorine Strip Lot _____
2. Temperature of rep. sample or temp blank when opened: 8.3 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: 2 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) EA

7. Were custody seals on containers: YES NO NO and Intact YES...NO...NA
Were these signed and dated correctly? YES...NO...NA
8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None
9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None
10. Did all containers arrive in good condition (unbroken)? YES...NO...NA
11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA
12. Did all container labels and tags agree with custody papers? YES...NO...NA
- 13a. Were VOA vials received? YES...NO...NA
- b. Was there any observable headspace present in any VOA vial? YES...NO...NA



Larger than this.

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

I certify that I unloaded the cooler and answered questions 7-14 (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 8/28/2018@ 1900

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

1. Tracking # N/A (last 4 digits, FedEx) Courier: _____
 IR Gun ID 31470368 pH Strip Lot _____ Chlorine Strip Lot _____
2. Temperature of rep. sample or temp blank when opened: 1.7 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: 2 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) EA

7. Were custody seals on containers: YES NO 8-28-18 EA and intact YES...NO...NA
 Were these signed and dated correctly? YES NO 8-28-18 EA 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



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) 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..# _____



Tennessee Valley Authority

TVA Environmental Investigations

COOLER No.:	1	of	3
COC No.:	CUF_BS_20180827_1A		
	1	of	1
Task Desc:	CUF_BS		

Chain-of-Custody / Analytical Request Document

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

Required Ship to Lab:		Required Project Information:		Required Sampler Information:	
Lab Name:	TestAmerica Nashville	Site ID #:	CUMBERLAND FOSSIL PLANT	Sampler:	Suama Bolden and Walker Padgett
Lab Address:	29360 Foster Creighton Dr Nashville, TN 37204	Project #:	177588209	Sampling Company:	Stanec
Lab Manager Contact Information:		Site Address:	815 Cumberland City Road	Address:	Warehouse Row North 1110 Market Street, Suite 214A
Lab PIS:	Gail Lage	City:	Cumberland City	City/State:	Chattanooga TN
Phone/Fax:	615-301-5741/615-726-3404	State, Zip:	TN, 37783	Phone:	(859) 619-8010
Lab Email:	Gail.Lage@testamericainc.com	Site PM Name:	Roy Quinn	Sampling Team Number:	1
		Phone/Fax:	423-751-3753	Send EDD/Hard Copy to:	tva-el@envetel.com
		Site PM Email:	rquinn@tva.gov		

Analysis Turnaround Time

CALENDAR DAYS WORKING DAYS

TAT if different from Below _____

24 Hours

3 Business Days

5 Business Days

10 Business Days (Standard)

ITEMS #	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.	MS/MSD	Analysis	Filtered	Preserve
			Depth Unit	Select Unit											
1	CUF-BS-FB05-20180827 ✓	BG-01	NA	NA	W	G	FB ✓	8/27/2018	1231	2		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	CUF-BS-BG01-0.0/0.5-20180827 ✓	BG-01	0.0	0.5	S	G	N	8/27/2018	1312	2		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	CUF-BS-BG01-1.0/3.0-20180827 ✓	BG-01	1.0	3.0	S	G	N	8/27/2018	1359	2		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	CUF-BS-BG01-6.5/8.5-20180827 ✓	BG-01	6.5	8.5	S	G	N	8/27/2018	1419	2		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5	CUF-BS-BG01-11.5/13.5-20180827 ✓	BG-01	11.5	13.5	S	G	N	8/27/2018	1445	2		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6	CUF-BS-BG01-16.5/18.5-20180827 ✓	BG-01	16.5	18.5	S	G	N	8/27/2018	1505	2		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7	CUF-BS-BG01-21.5/23.5-20180827 ✓	BG-01	21.5	23.5	S	G	N	8/27/2018	1525	2		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8	CUF-BS-EB02-20180827 ✓	BG-01	NA	NA	W	G	EB ✓	8/27/2018	1555	2		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
9												<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10												<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11												<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12												<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13												<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Loc: 490
158137
#1
A

8/27/2018

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					
Suama Bolden (Stanec)	8/27/2018	17:00	<i>[Signature]</i>	8-27-18	1900	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
						<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
						<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
						<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
						<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
SHIPPING METHOD:		SAMPLER NAME AND SIGNATURE				Temperature in °C	Sample on Ice?	Sample Intact?	Trip Blank?		
Courier	Suama Bolden	<i>[Signature]</i>									

Page 338 of 341



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 3
COC No.: CUF BS 20180827 1B
Task Desc: CUF BS

Required Ship to Lab: TestAmerica Nashville
Required Project Information: CUMBERLAND FOSSIL PLANT
Required Sampler Information: Suama Bolden and Walker Padgett

Analysis Turnaround Time
CALENDAR DAYS
WORKING DAYS
TAT if different from Below: Standard (28 days)

Table with columns: ITEMS #, SAMPLE ID, SAMPLE LOCATION, SAMPLE DATE, SAMPLE TIME, F OF CONTAINERS, Comments/Lab Sample I.D.

Grid for sample tracking with columns: Filtered, Preserved, Analyzed, etc. Includes handwritten notes and 'Loc: 490 158137'

Additional Comments/Special Instructions:
Handwritten note: SB 8/27/2018

Table for Relinquished By / Affiliation, Date, Time, Accepted By / Affiliation, Date, Time, Shipping Method, Sampler Name and Signature

Table for Sample Receipt Conditions: Temperature in °C, Sample on Ice?, Sample Intact?, Trip Blank?

490-157892 Waybill



490-158137 Waybill



490-157991 Waybill



490-164382 Waybill



490-158029 Waybill



490-158137 Waybill



490-157829 Waybill



ORIGIN 10570
SHIPPING
TEST AMERICA
2960 FOSTER RD
NASHVILLE, TN 37204
UNITED STATES US

TO SHIPPING/RECEIVING
TESTAMERICA LABORA
301 ALPHA DRIVE
RIDC PARK
PITTSBURGH PA 15238
REF: 6490-92791



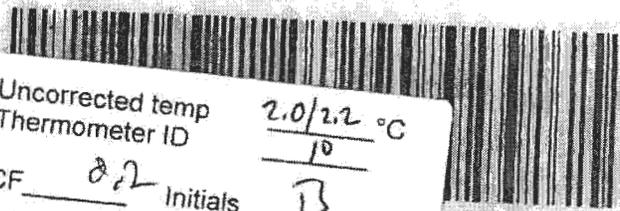
4587 8113 9403

FRI - 07 DEC 10:30A
PRIORITY OVERNIGHT

EV AGCA

15238
PA-US PIT

Uncorrected temp 2.0/2.2 °C
Thermometer ID 10
CF 02 Initials B



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

Job Narrative
490-158137-2 ✓

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 264947 were outside control limits for several analytes. 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. ✓

490-157892 Waybill



490-158137 Waybill



490-157991 Waybill



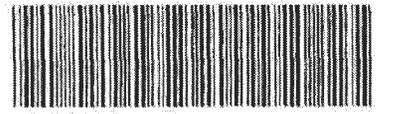
490-164382 Waybill



490-158029 Waybill



490-158137 Waybill

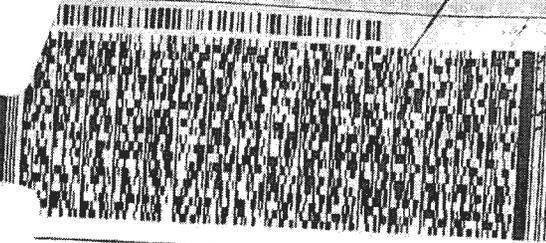


490-157829 Waybill



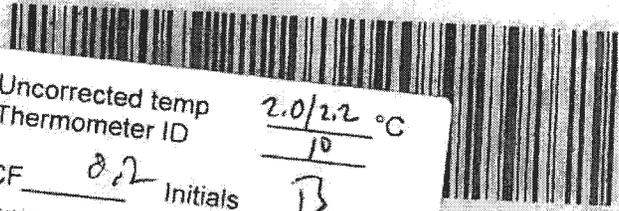
ORIGINATOR
SHIP TO
TEST AMERICA
2980 FOSTER CRYSTAL
NASHVILLE, TN 37204
UNITED STATES U

TO SHIPPING/RECEIVING
TESTAMERICA LABORATORY
301 ALPHA DRIVE
RIDC PARK
PITTSBURGH PA 15238
REF: 6490-32791



FedEx EXT. **E**

4587 8113 9403 FRI - 07 DEC 10:30A
15238
PA-US PIT
EV AGCA



Uncorrected temp 2.0/2.2 °C
Thermometer ID 10
CF 0.2 Initials B
PT-MI-SR-001 effective 7/26/13

TestAmerica Nashville

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

Chain of Custody Record



490-158137 Chain of Custody



100 IN 2 1/2" (25.4) x 100 IN 1/4" (6.35) x 100 IN 1/4" (6.35)

Client Information (Sub Contract Lab)		Sampler:		Lab PM: Lage, Gail		490-158137 Chain of Custody		10.1																																																																							
Client Contact: Shipping/Receiving		Phone:		E-Mail: gail.lage@testamericainc.com		State or Origin: Tennessee		Page Page 1 of 1																																																																							
Company: TestAmerica Laboratories, Inc.		Due Date Requested: 12/12/2018		Accreditations Required (See note):		Job #: 490-158137-2		Preservation Codes:																																																																							
Address: 301 Alpha Drive, RIDC Park,		TAT Requested (days):		<table border="1"> <tr> <th colspan="12">Analysis Requested</th> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>		Analysis Requested																																																<table border="0"> <tr> <td>A - HCL</td> <td>M - Hexane</td> </tr> <tr> <td>B - NaOH</td> <td>N - None</td> </tr> <tr> <td>C - Zn Acetate</td> <td>D - AsNaO2</td> </tr> <tr> <td>D - Nitric Acid</td> <td>P - Na2O4S</td> </tr> <tr> <td>E - NaHSO4</td> <td>Q - Na2SO3</td> </tr> <tr> <td>F - MeOH</td> <td>R - Na2S2O3</td> </tr> <tr> <td>G - Amchlor</td> <td>S - H2SO4</td> </tr> <tr> <td>H - Ascorbic Acid</td> <td>T - TSP Dodecahydrate</td> </tr> <tr> <td>I - Ice</td> <td>U - Acetone</td> </tr> <tr> <td>J - DI Water</td> <td>V - MCAA</td> </tr> <tr> <td>K - EDTA</td> <td>W - pH 4-5</td> </tr> <tr> <td>L - EDA</td> <td>Z - Other (Specify)</td> </tr> </table>		A - HCL	M - Hexane	B - NaOH	N - None	C - Zn Acetate	D - AsNaO2	D - Nitric Acid	P - Na2O4S	E - NaHSO4	Q - Na2SO3	F - MeOH	R - Na2S2O3	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)
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City: Pittsburgh		PO #:		Field Filtered Sample (Yes or No)		Total Number of Containers		Special Instructions/Note:																																																																							
State, Zip: PA, 15238		WO #:		Perform MS/MSD (Yes or No)																																																																											
Phone: 412-963-7058(Tel) 412-963-2468(Fax)		Project #: 49014071		6020A/0050B (MOO) Custom Metals																																																																											
Email:		SSOW#:																																																																													
Project Name: CUF_BS_20180827_1A																																																																															
Site:																																																																															
Sample Identification - Client ID (Lab ID)		Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Per water, Seawater, Drinking water, BT-Tissue, AirAs)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/0050B (MOO) Custom Metals	Total Number of Containers	Special Instructions/Note:																																																																					
CUF-BS-BG01-0.0/0.5-20180827 (490-158137-2)		8/27/18	13:12 Central		Solid		X		1	TVA - container labeled 490-158139-2																																																																					
CUF-BS-BG01-1.0/3.0-20180827 (490-158137-3)		8/27/18	13:59 Central		Solid		X		1	TVA - container labeled 490-158139-3																																																																					
CUF-BS-BG01-6.5/8.5-20180827 (490-158137-4)		8/27/18	14:19 Central		Solid		X		1	TVA - container labeled 490-158139-4																																																																					
CUF-BS-BG01-11.5/13.5-20180827 (490-158137-5)		8/27/18	14:45 Central		Solid		X		1	TVA - container labeled 490-158139-5																																																																					
CUF-BS-BG01-16.5/18.5-20180827 (490-158137-6)		8/27/18	15:05 Central		Solid		X		1	TVA - container labeled 490-158139-6																																																																					
CUF-BS-BG01-21.5/23.5-20180827 (490-158137-7)		8/27/18	15:25 Central		Solid		X		1	TVA - container labeled 490-158139-7																																																																					

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		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 _____ Month/s	

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>overholser</i>	Date/Time: 12-6-18/1630	Company: <i>STPL</i>	Received by: <i>LD 12618</i>
Relinquished by:	Date/Time:	Company:	Received by: <i>[Signature]</i>
Relinquished by:	Date/Time:	Company:	Received by: <i>[Signature]</i>

Custody Seals Intact: A Yes A No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
-------------------------------------	-------------------	---

Page 539 of 541

Login Sample Receipt Checklist

Client: Environmental Standards Inc.

Job Number: 490-158137-2

Login Number: 158137

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: 490-158137-2

Login Number: 158137

List Number: 3

Creator: Say, Thomas C

List Source: TestAmerica Pittsburgh

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

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	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 $<6\text{mm}$ (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

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]
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
www.EurofinsUS.com | 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 defensible. 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 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

From: Andrew Piasecki [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 • apiasecki@envstd.com

Emergency Response Quality Assurance Hotline: 855.374.7272



From: CSO – TVA Projects [mailto:TVAProjects@testamericainc.com]
Sent: Wednesday, January 30, 2019 11:33 AM
To: Andrew Piasecki <apiasecki@envstd.com>
Cc: CSO – TVA Projects <TVAProjects@testamericainc.com>; TVA_Deliverables <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

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 • 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?

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

GAIL A LAGE

Project Manager

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Andrew Piasecki

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.

GAIL A LAGE

Project Manager

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From: Amanda Cover [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

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>; TVA_Deliverables <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
Environmental Standards, Inc.
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Emergency Response Quality Assurance Hotline: 855.374.7272



From: Lage, Gail [<mailto:Gail.Lage@testamericainc.com>]

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

To: Andrew Piasecki <apiasecki@envstd.com>; CSO – TVA Projects <TVAProjects@testamericainc.com>; Amanda Cover <ACover@envstd.com>

Cc: Jennifer Gable <jgable@envstd.com>; TVA_Deliverables <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 2nd point removed from the calibration.

GAIL A LAGE

Project Manager

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From: Andrew Piasecki [<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

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
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From: CSO – TVA Projects [<mailto:TVAProjects@testamericainc.com>]
Sent: Monday, November 12, 2018 3:24 PM
To: CSO – TVA Projects <TVAProjects@testamericainc.com>; Amanda Cover <ACover@envstd.com>
Cc: Jennifer Gable <jgable@envstd.com>; TVA_Deliverables <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 2nd 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

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
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