

**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 six background soil samples and aqueous blank collected on August 22, 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 490-157892-1 and 490-157892-2.

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-BG02-1.5/3.5-20180822	490-157991-1 490-157892-2	490-157892-1 490-157892-2	Soil	8/22/18	A, Hg, pH M
CUF-BS-BG02-5.0/7.6-20180822	490-157991-2	490-157892-1 490-157892-2	Soil	8/22/18	A, Hg, pH M
CUF-BS-FB02-20180822 (Field Blank)	490-157991-3	490-157892-1 490-157892-2	Aq	8/22/18	A, Hg M
CUF-BS-BG02-0/0.5-20180822	490-157991-4	490-157892-1 490-157892-2	Soil	8/22/18	A, Hg, pH M
CUF-BS-BG03-1.3/3.2-20180822	490-157991-5	490-157892-1 490-157892-2	Soil	8/22/18	A, Hg, pH M
CUF-BS-BG03-5.2/7.2-20180822	490-157991-6	490-157892-1 490-157892-2	Soil	8/22/18	A, Hg, pH M
CUF-BS-BG03-0/0.5-20180822	490-157991-7	490-157892-1 490-157892-2	Soil	8/22/18	A, Hg, pH M

Parameters Examined

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

Items Reviewed	
Holding Times	Instrument Tuning and Calibrations
Sample Preservation	Reporting Limit (RL) Standard Recoveries
Chain-of-Custody (COC) Record and Case Narrative	Internal Standard Recoveries
Blank Results	Serial Dilution Analysis
Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results	Post-Digestion Spike Results
Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Results	Sample Preparation
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	490-157892-1	CUF-BS-BG02-5.0/7.6-20180822, CUF-BS-BG02-0/0.5-20180822, and CUF-BS-BG03-0/0.5-20180822	U*	BE, BF, BL
chloride	490-157892-1	CUF-BS-BG02-0/0.5-20180822, and CUF-BS-BG03-0/0.5-20180822	U*	BE, BF, BL
antimony and selenium	490-157892-2	All samples except CUF-BS-FB02-20180822	J	M-
lithium	490-157892-2	All samples except CUF-BS-FB02-20180822	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)

Review performed by: Allison M. Felix, Quality Assurance Chemist
Review reviewed by: Amanda J. Cover, Senior Quality Assurance Chemist
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: 2/26/19

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

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.

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:			%	15.5									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.652	J	M-	0.0756	0.0756	0.244	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	7.37			0.0317	0.0317	0.122	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	74.8			0.0695	0.0695	1.22	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.616			0.00915	0.00915	0.122	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	2.13	J	RL	0.931	0.931	9.76	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.0547	J	RL	0.0207	0.0207	0.122	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	1570			10.9	10.9	61.0	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	21.6			0.0805	0.0805	0.244	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	11.7			0.0101	0.0101	0.0610	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	12.0			0.138	0.138	0.244	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	18.0			0.0427	0.0427	0.122	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	8.55	J	M+	0.337	0.337	0.610	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	1.59			0.0756	0.0756	0.610	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	12.9			0.0744	0.0744	0.122	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.468	J	M-,RL	0.0732	0.0732	0.610	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0249	J	RL	0.0171	0.0171	0.122	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.261			0.0159	0.0159	0.122	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	33.8			0.0744	0.0744	0.122	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	30.2			0.408	0.408	0.610	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG	0.0525	J	RL	0.0350	0.0350	0.117	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		8.26	8.26	11.8	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG		U		0.944	0.944	1.18	N	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG	51.8			7.08	7.08	11.8	Y	Yes	1	DRY

				Lab Sample ID	490-157892-2									
				Sys Sample Code	CUF-BS-BG02-5.0/7.6-20180822									
				Sample Name	CUF-BS-BG02-5.0/7.6-20180822									
				Sample Date	8/22/2018 11:25:00 AM									
				Location	BG-02									
				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:			%	17.1									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.303	J	M-	0.0755	0.0755	0.244	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	3.67			0.0317	0.0317	0.122	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	50.0			0.0694	0.0694	1.22	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.781			0.00914	0.00914	0.122	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	7.00	J	RL	0.929	0.929	9.74	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.0672	J	RL	0.0207	0.0207	0.122	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	131000			10.9	10.9	60.9	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	16.0			0.0804	0.0804	0.244	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	6.19			0.0101	0.0101	0.0609	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	11.2			0.138	0.138	0.244	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	6.95			0.0426	0.0426	0.122	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	11.1	J	M+	0.336	0.336	0.609	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	1.09			0.0755	0.0755	0.609	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	18.7			0.0743	0.0743	0.122	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.344	J	M-,RL	0.0731	0.0731	0.609	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0353	J	RL	0.0171	0.0171	0.122	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.195			0.0158	0.0158	0.122	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	16.5			0.0743	0.0743	0.122	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	29.2			0.407	0.407	0.609	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG	0.0408	J	RL	0.0365	0.0365	0.122	Y	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	8.3			0.1	0.1	0.1	Y	Yes	1	WET
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		8.51	8.51	12.2	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG	1.39			0.973	0.973	1.22	Y	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG		U*	BE,BF,BL,RL	7.95	7.95	12.2	N	Yes	1	DRY

	Lab Sample ID	490-157892-3												
	Sys Sample Code	CUF-BS-FB02-20180822												
	Sample Name	CUF-BS-FB02-20180822												
	Sample Date	8/22/2018 11:47:00 AM												
	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	0.127	J	RL	0.116	0.116	0.500	Y	Yes	1	NA
	Chromium	7440-47-3	T	MG/L	0.00139	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	0.000323	J	RL	0.000312	0.000312	0.00100	Y	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	0.228	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	0.433	J	RL	0.0300	0.0300	1.00	Y	Yes	1	NA

Lab Sample ID	490-157892-4									
Sys Sample Code	CUF-BS-BG02-0/0.5-20180822									
Sample Name	CUF-BS-BG02-0/0.5-20180822									
Sample Date	8/22/2018 11:56:00 AM									
Location	BG-02									
Sample Type	N									
Parent Sample										
Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
%	16.9									
MG/KG	0.314	J	M-	0.0731	0.0731	0.236	Y	Yes	1	DRY
MG/KG	4.27			0.0307	0.0307	0.118	Y	Yes	1	DRY
MG/KG	60.7			0.0672	0.0672	1.18	Y	Yes	1	DRY
MG/KG	0.663			0.00884	0.00884	0.118	Y	Yes	1	DRY
MG/KG	1.50	J	RL	0.900	0.900	9.43	Y	Yes	1	DRY
MG/KG	0.108	J	RL	0.0200	0.0200	0.118	Y	Yes	1	DRY
MG/KG	1050			10.6	10.6	59.0	Y	Yes	1	DRY
MG/KG	14.5			0.0778	0.0778	0.236	Y	Yes	1	DRY
MG/KG	7.48			0.00979	0.00979	0.0590	Y	Yes	1	DRY
MG/KG	5.51			0.133	0.133	0.236	Y	Yes	1	DRY
MG/KG	12.4			0.0413	0.0413	0.118	Y	Yes	1	DRY
MG/KG	3.93	J	M+	0.325	0.325	0.590	Y	Yes	1	DRY
MG/KG	0.660			0.0731	0.0731	0.590	Y	Yes	1	DRY
MG/KG	6.84			0.0719	0.0719	0.118	Y	Yes	1	DRY
MG/KG	0.588	J	M-,RL	0.0708	0.0708	0.590	Y	Yes	1	DRY
MG/KG	0.0285	J	RL	0.0165	0.0165	0.118	Y	Yes	1	DRY
MG/KG	0.142			0.0153	0.0153	0.118	Y	Yes	1	DRY
MG/KG	19.1			0.0719	0.0719	0.118	Y	Yes	1	DRY
MG/KG	20.8			0.394	0.394	0.590	Y	Yes	1	DRY
MG/KG		U		0.0361	0.0361	0.120	N	Yes	1	DRY
SU	5.5			0.1	0.1	0.1	Y	Yes	1	WET
MG/KG		U*	BE,BF,BL,RL	10.0	10.0	12.0	N	Yes	1	DRY
MG/KG	1.19	J	RL	0.962	0.962	1.20	Y	Yes	1	DRY
MG/KG		U*	BE,BF,BL	22.1	22.1	22.1	N	Yes	1	DRY

				Lab Sample ID	490-157892-5									
				Sys Sample Code	CUF-BS-BG03-1.2/3.2-20180822									
				Sample Name	CUF-BS-BG03-1.2/3.2-20180822									
				Sample Date	8/22/2018 2:57:00 PM									
				Location	BG-03									
				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:			%	12.5									
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.492	J	M-	0.0738	0.0738	0.238	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	15.0			0.0310	0.0310	0.119	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	90.2			0.0679	0.0679	1.19	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.724			0.00893	0.00893	0.119	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	2.28	J	RL	0.908	0.908	9.53	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.107	J	RL	0.0202	0.0202	0.119	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	674			10.7	10.7	59.5	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	19.0			0.0786	0.0786	0.238	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	15.3			0.00988	0.00988	0.0595	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	22.1			0.135	0.135	0.238	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	24.8			0.0417	0.0417	0.119	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	9.26	J	M+	0.329	0.329	0.595	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	2.32			0.0738	0.0738	0.595	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	18.3			0.0726	0.0726	0.119	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.622	J	M-	0.0714	0.0714	0.595	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0262	J	RL	0.0167	0.0167	0.119	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.232			0.0155	0.0155	0.119	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	34.7			0.0726	0.0726	0.119	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	30.8			0.398	0.398	0.595	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG	0.0469	J	RL	0.0345	0.0345	0.115	Y	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	5.7			0.1	0.1	0.1	Y	Yes	1	WET
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		8.01	8.01	11.4	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG		U		0.915	0.915	1.14	N	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG	81.5			6.87	6.87	11.4	Y	Yes	1	DRY

Lab Sample ID	490-157892-6									
Sys Sample Code	CUF-BS-BG03-5.2/7.2-20180822									
Sample Name	CUF-BS-BG03-5.2/7.2-20180822									
Sample Date	8/22/2018 3:26:00 PM									
Location	BG-03									
Sample Type	N									
Parent Sample										
Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
%	20.7									
MG/KG	0.714	J	M-	0.0823	0.0823	0.265	Y	Yes	1	DRY
MG/KG	88.7			0.0345	0.0345	0.133	Y	Yes	1	DRY
MG/KG	133			0.0757	0.0757	1.33	Y	Yes	1	DRY
MG/KG	1.27			0.00995	0.00995	0.133	Y	Yes	1	DRY
MG/KG	2.38	J	RL	1.01	1.01	10.6	Y	Yes	1	DRY
MG/KG	0.285			0.0226	0.0226	0.133	Y	Yes	1	DRY
MG/KG	3980			11.9	11.9	66.4	Y	Yes	1	DRY
MG/KG	25.1			0.0876	0.0876	0.265	Y	Yes	1	DRY
MG/KG	14.2			0.0110	0.0110	0.0664	Y	Yes	1	DRY
MG/KG	77.2			0.150	0.150	0.265	Y	Yes	1	DRY
MG/KG	41.9			0.0465	0.0465	0.133	Y	Yes	1	DRY
MG/KG	14.3	J	M+	0.366	0.366	0.664	Y	Yes	1	DRY
MG/KG	4.43			0.0823	0.0823	0.664	Y	Yes	1	DRY
MG/KG	44.8			0.0810	0.0810	0.133	Y	Yes	1	DRY
MG/KG	1.08	J	M-	0.0796	0.0796	0.664	Y	Yes	1	DRY
MG/KG	0.0624	J	RL	0.0186	0.0186	0.133	Y	Yes	1	DRY
MG/KG	0.271			0.0173	0.0173	0.133	Y	Yes	1	DRY
MG/KG	44.5			0.0810	0.0810	0.133	Y	Yes	1	DRY
MG/KG	51.6			0.443	0.443	0.664	Y	Yes	1	DRY
MG/KG		U		0.0368	0.0368	0.123	N	Yes	1	DRY
SU	7.6			0.1	0.1	0.1	Y	Yes	1	WET
MG/KG		U		8.84	8.84	12.6	N	Yes	1	DRY
MG/KG	2.66			1.01	1.01	1.26	Y	Yes	1	DRY
MG/KG	31.5			7.58	7.58	12.6	Y	Yes	1	DRY

Lab Sample ID	490-157892-7									
Sys Sample Code	CUF-BS-BG03-0/0.5-20180822									
Sample Name	CUF-BS-BG03-0/0.5-20180822									
Sample Date	8/22/2018 3:31:00 PM									
Location	BG-03									
Sample Type	N									
Parent Sample										
Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
%	19.2									
MG/KG	0.254	J	M-	0.0807	0.0807	0.260	Y	Yes	1	DRY
MG/KG	6.34			0.0339	0.0339	0.130	Y	Yes	1	DRY
MG/KG	58.0			0.0742	0.0742	1.30	Y	Yes	1	DRY
MG/KG	0.440			0.00977	0.00977	0.130	Y	Yes	1	DRY
MG/KG	2.04	J	RL	0.994	0.994	10.4	Y	Yes	1	DRY
MG/KG	0.0891	J	RL	0.0221	0.0221	0.130	Y	Yes	1	DRY
MG/KG	1320			11.7	11.7	65.1	Y	Yes	1	DRY
MG/KG	12.6			0.0859	0.0859	0.260	Y	Yes	1	DRY
MG/KG	7.91			0.0108	0.0108	0.0651	Y	Yes	1	DRY
MG/KG	12.1			0.147	0.147	0.260	Y	Yes	1	DRY
MG/KG	14.6			0.0456	0.0456	0.130	Y	Yes	1	DRY
MG/KG	5.15	J	M+	0.359	0.359	0.651	Y	Yes	1	DRY
MG/KG	0.846			0.0807	0.0807	0.651	Y	Yes	1	DRY
MG/KG	8.02			0.0794	0.0794	0.130	Y	Yes	1	DRY
MG/KG	0.647	J	M-	0.0781	0.0781	0.651	Y	Yes	1	DRY
MG/KG	0.0275	J	RL	0.0182	0.0182	0.130	Y	Yes	1	DRY
MG/KG	0.131			0.0169	0.0169	0.130	Y	Yes	1	DRY
MG/KG	22.5			0.0794	0.0794	0.130	Y	Yes	1	DRY
MG/KG	27.0			0.435	0.435	0.651	Y	Yes	1	DRY
MG/KG		U		0.0370	0.0370	0.123	N	Yes	1	DRY
SU	5.9			0.1	0.1	0.1	Y	Yes	1	WET
MG/KG		U*	BE,BF,BL,RL	10.8	10.8	12.3	N	Yes	1	DRY
MG/KG	2.31			0.982	0.982	1.23	Y	Yes	1	DRY
MG/KG		U*	BE,BF,BL	17.0	17.0	17.0	N	Yes	1	DRY

SECTION 3

SUPPORTING DOCUMENTATION FOR QUALIFIERS



INORGANIC ANALYSIS SUPPORT DOCUMENTATION

ESI project name: TVA CUF
Sample Collection Dates: 8/22/18
Job Number: 20188111.A
Project Manager: Andrew Piasecki
Laboratory: TestAmerica Pittsburgh,
Nashville

Reviewed by: Allison Felix
Approved by:
Completion Date: *Ac*
2/2019

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

		<u>Sample No.</u>	<u>Lab Control No.</u>
Deliverable:	CLP (Full) ()		
Level IV (Full)	(X)	All	490-157892-1
Limited	()		
Other:			

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

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

Comments: _____



BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

Aq = Aqueous; S = Solid

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



BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

Aq = Aqueous; S = Solid

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

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20180823_1A

TestAmerica Job ID: 490-157991-1

Client Sample ID: CUF-BS-EB01-20180823

Lab Sample ID: 490-157991-6

Matrix: Water

Date Collected: 08/23/18 11:13

Date Received: 08/23/18 19:54

Method: 9056A - Anions, Ion Chromatography

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

Method: 7470A - Mercury (CVAA)

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

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

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

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

Highest blank result applied to samples.

Cl results for BG02-0/0.5 and BG03-0/0.5 qualified U*,BL.

SO4 results for BG02-5.0/7.6, BG02-0/0.5, and BG03-0.0.5 qualified U*,BE.

All CA, Cr and V results > 5x EBs, no impact.

TestAmerica Nashville

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

Matrix: Water

Date Collected: 08/21/18 14:55
Date Received: 08/21/18 20:00

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.200	J B	1.00	0.200	mg/L			08/23/18 12:24	1
Fluoride	0.0360	J B	0.100	0.0100	mg/L			08/23/18 12:24	1
Sulfate	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

all others @>5% or ND

TestAmerica Nashville

QC Sample Results

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20180822_1A

TestAmerica Job ID: 490-157892-2

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

Lab Sample ID: 490-157829-D-5-B MS

QC from another CUF SDG. applies.

Matrix: Solid

Analysis Batch: 265229

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Batch: 264944

%Rec.

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Antimony	0.218	J F1	65.5	46.03	F1	mg/Kg	⊗	✓ 70	75 - 125
Arsenic	4.93		5.24	9.346		mg/Kg	⊗	84	75 - 125
Barium	56.4		262	310.9		mg/Kg	⊗	97	75 - 125
Beryllium	0.554		6.55	6.784		mg/Kg	⊗	95	75 - 125
Boron	1.72	J	131	116.8		mg/Kg	⊗	88	75 - 125
Cadmium	0.0825	J	6.55	5.908		mg/Kg	⊗	89	75 - 125
Calcium	846		6550	6484		mg/Kg	⊗	86	75 - 125
Chromium	14.8		26.2	39.05		mg/Kg	⊗	92	75 - 125
Cobalt	7.05		65.5	61.67		mg/Kg	⊗	83	75 - 125
Copper	12.2		32.7	37.36		mg/Kg	⊗	77	75 - 125
Lead Parent >4x spike	12.7		2.62	17.78	4	mg/Kg	⊗	196	75 - 125
Lithium	5.22	F1	6.55	17.03	F1	mg/Kg	⊗	✓ 180	75 - 125
Molybdenum	0.740		131	128.9		mg/Kg	⊗	98	75 - 125
Nickel	8.28		65.5	62.01		mg/Kg	⊗	82	75 - 125
Selenium	0.549	J F1	1.31	1.524	F1	mg/Kg	⊗	✓ 74	75 - 125
Silver	0.0239	J	6.55	6.183		mg/Kg	⊗	94	75 - 125
Thallium	0.138		6.55	5.731		mg/Kg	⊗	85	75 - 125
Vanadium	23.1		65.5	78.11		mg/Kg	⊗	84	75 - 125
Zinc	30.5		65.5	88.19		mg/Kg	⊗	88	75 - 125

Lab Sample ID: 490-157829-D-5-C MSD

Matrix: Solid

Analysis Batch: 265229

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 264944

%Rec.

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Antimony	0.218	J F1	62.3	42.44	F1	mg/Kg	⊗	✓ 68	75 - 125	✓ 8	20
Arsenic	4.93		4.98	10.59		mg/Kg	⊗	113	75 - 125	12	20
Barium	56.4		249	297.6		mg/Kg	⊗	97	75 - 125	4	20
Beryllium	0.554		6.23	6.367		mg/Kg	⊗	93	75 - 125	6	20
Boron	1.72	J	125	107.0		mg/Kg	⊗	85	75 - 125	9	20
Cadmium	0.0825	J	6.23	5.599		mg/Kg	⊗	89	75 - 125	5	20
Calcium	846		6230	6285		mg/Kg	⊗	87	75 - 125	3	20
Chromium	14.8		24.9	43.49		mg/Kg	⊗	115	75 - 125	11	20
Cobalt	7.05		62.3	62.71		mg/Kg	⊗	89	75 - 125	2	20
Copper	12.2		31.2	36.60		mg/Kg	⊗	78	75 - 125	2	20
Lead Parent >4x spike	12.7		2.49	19.75	4	mg/Kg	⊗	285	75 - 125	✓ 10	20
Lithium	5.22	F1	6.23	16.60	F1	mg/Kg	⊗	✓ 183	75 - 125	✓ 3	20
Molybdenum	0.740		125	121.1		mg/Kg	⊗	97	75 - 125	6	20
Nickel	8.28		62.3	61.21		mg/Kg	⊗	85	75 - 125	1	20
Selenium	0.549	J F1	1.25	1.549		mg/Kg	⊗	✓ 80	75 - 125	✓ 2	20
Silver	0.0239	J	6.23	5.782		mg/Kg	⊗	92	75 - 125	7	20
Thallium	0.138		6.23	5.529		mg/Kg	⊗	87	75 - 125	4	20
Vanadium	23.1		62.3	83.01		mg/Kg	⊗	96	75 - 125	6	20
Zinc	30.5		62.3	91.15		mg/Kg	⊗	97	75 - 125	3	20

Qualify Sb and Se results J/UJ,M-.

Qualify Li results J/UJ,J+.

See Metals QC forms for PS and SDILT..

TestAmerica Nashville

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Nashville Job No.: 490-157892-1
 SDG No.:
 Client Sample ID: Lab Sample ID: CCB 490-539644/20
 Matrix: Solid Lab File ID: 082918IC9_061dat-Conductivity.
 Analysis Method: 9056A Date Collected:
 Extraction Method: Date Extracted:
 Sample wt/vol: 10 (mL) Date Analyzed: 08/29/2018 21:41
 Con. Extract Vol.: Dilution Factor: 1
 Injection Volume: 1 (uL) GC Column: Metrohm ASupp4 ID: 4 (mm)
 % Moisture: GPC Cleanup: (Y/N) N
 Analysis Batch No.: 539644 Units: mg/L

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

Highest blank values (this blank) used to evaluate sample results.

Cl results for BG02-0/0.5 and BG03-0/0.5 qualified U*,BL.
 SO4 results for BG02-5.0/7.6, BG02-0/0.5, and BG03-0/0.5 qualified U*,BL.

SECTION 4

CASE NARRATIVE AND CHAIN-OF-CUSTODY RECORD

**Job Narrative
490-157892-1**

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 490-157892-2

Receipt

The samples were received on 8/22/2018 5:45 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 4.3° C and 5.5° C.

HPLC/IC

Method(s) 9056A: The method blank for analytical batch 490-538638 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 or re-analysis of samples was not performed.

Method(s) 9056, 9056A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 490-538638 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.

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

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

Organic Prep

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

**Job Narrative
490-157892-2**

Comments

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

Metals

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

Sample Summary

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20180822_1A

TestAmerica Job ID: 490-157892-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-157892-1	CUF-BS-BG02-1.5/3.5-20180822	Solid	08/22/18 11:09	08/22/18 17:45
490-157892-2	CUF-BS-BG02-5.0/7.6-20180822	Solid	08/22/18 11:25	08/22/18 17:45
490-157892-3	CUF-BS-FB02-20180822	Water	08/22/18 11:47	08/22/18 17:45
490-157892-4	CUF-BS-BG02-0/0.5-20180822	Solid	08/22/18 11:56	08/22/18 17:45
490-157892-5	CUF-BS-BG03-1.2/3.2-20180822	Solid	08/22/18 14:57	08/22/18 17:45
490-157892-6	CUF-BS-BG03-5.2/7.2-20180822	Solid	08/22/18 15:26	08/22/18 17:45
490-157892-7	CUF-BS-BG03-0/0.5-20180822	Solid	08/22/18 15:31	08/22/18 17:45

TestAmerica Nashville

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

Chain of Custody Record



490-157892 Chain of Custody

estAmerica

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Client Information (Sub Contract Lab)		Sampler:	Lab PM: Lage, Gail	490-157892 Chain of Custody											
Client Contact: Shipping/Receiving		Phone:	E-Mail: gail.lage@testamericainc.com	State of Origin: Tennessee		Page:		C No: 0-83340.1							
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note)										Page 1 of 1			
Address: 301 Alpha Drive, RIDC Park,		Due Date Requested: 12/12/2018		Analysis Requested										Job #: 490-157892-2	
City: Pittsburgh		TAT Requested (days):												Preservation Codes:	
State, Zip: PA, 15238														A - HCl B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchior H - Ascorbic Acid I - Ice J - Di Water K - EDTA L - EDA	M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SzO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify):
Phone: 412-963-7058(Tel) 412-963-2468(Fax)		PO #:												Other:	
Email:		WO #:													
Project Name: CUF_BS_20180822_1A		Project #: 49014071													
Site:		SSOW#:													
Sample Identification - Client ID (Lab ID)		Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, G=soil, O=waste, A=air)	Field Filtered Sample (Yes or No)	Perform MSD/MSD (Yes or No)	02/20A/3050B (MOD) Custom Metals	Total Number of containers	Special Instructions/Note:					
CUF-BS-BG02-1.5/3.5-20180822 (490-157892-1)		8/22/18	11:09 Central	Solid		X				1 TVA - containers labeled 490-157893-1					
CUF-BS-BG02-5.0/7.6-20180822 (490-157892-2)		8/22/18	11:25 Central	Solid		X				1 TVA - containers labeled 490-157893-2					
CUF-BS-BG02-0/0.5-20180822 (490-157892-4)		8/22/18	11:56 Central	Solid		X				1 TVA - containers labeled 490-157893-4					
CUF-BS-BG03-1.2/3.2-20180822 (490-157892-5)		8/22/18	14:57 Central	Solid		X				1 TVA - containers labeled 490-157893-5					
CUF-BS-BG03-5.2/7.2-20180822 (490-157892-6)		8/22/18	15:26 Central	Solid		X				1 TVA - containers labeled 490-157893-6					
CUF-BS-BG03-0/0.5-20180822 (490-157892-7)		8/22/18	15:31 Central	Solid		X				1 TVA - containers labeled 490-157893-7					
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 Unconfirmed							Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For Months								
Deliverable Requested: I, II, III, IV, Other (specify)		Primary Deliverable Rank: 2		Special Instructions/QC Requirements:											
Empty Kit Relinquished by: <i>Nicholas Prior</i>		Date:		Time:		Method of Shipment:									
Relinquished by:		Date/Time: 12-6-18/1630		Company:		Received by: <i>SL</i>		Date/Time: 12-7-18/1030		Company: <i>MPD</i>					
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:					
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:					
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:												

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 analytes listed below, 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

Deliverable Requested: I, II, III, IV, Other (specify)

Primary Deliverable Rank: 2

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

[Return To Client](#)

proposal by Lab

— Archive For

Monthe

Empty Kit Relinquished by:

Date

Time

Method of Shipment

Re-knawledged by:

Date/Time

— 1 —

Digitized by srujanika@gmail.com

Digitized by srujanika@gmail.com

Custody Seals Int'l.

[View Details](#) | [Edit](#) | [Delete](#)

COOLER RECEIPT FORM



Cooler Received/Opened On 08-22-2018 @ 1745

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

1. Tracking # Ni4 (last 4 digits, FedEx) Courier: Lab

IR Gun ID 17960358 pH Strip Lot _____ Chlorine Strip Lot _____

2. Temperature of rep. sample or temp blank when opened: 5.5 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES...NA

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

If yes, how many and where: _____

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

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

I certify that I opened the cooler and answered questions 1-6 (initial) E4

7. Were custody seals on containers: YES NO 6-22-18 E4 and intact YES...NO...NA 6-22-18 E4

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 # NA

I certify that I unloaded the cooler and answered questions 7-14 (initial) E4

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) E4

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) E4

I certify that I attached a label with the unique LIMS number to each container (initial) E4

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

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

Loc: 49C
157892

COOLER RECEIPT FORM

Cooler Received/Opened On 08-22-2018 @ 1745

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

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

IR Gun ID 17960358 pH Strip Lot _____ Chlorine Strip Lot _____

2. Temperature of rep. sample or temp blank when opened: 43 Degrees Celsius

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

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

If yes, how many and where: _____

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

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

I certify that I opened the cooler and answered questions 1-6 (initial) EJ

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

Were these signed and dated correctly? YES...NO...NA 8-22-18 EJ

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) EJ

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) EJ

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) EJ

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

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.:	6	of	2
COC No.:	CUF_BS 20180822_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:	Suema Bolden & Walker Padgett	
Lab Address:	29360 Foster Creighton Dr	Project #:	177568209		Sampling Company:	Stantec	
	Nashville, TN 37204	Site Address:	815 Cumberland City Road		Address:	Warehouse Row North 1110 Market Street, Suite 214A	
		City:	Cumberland City	State, Zip:	TN, 37763	City/State:	Chattanooga, TN
		Site PM Name:	Roy Quinn		Phone:	(859)-619-8010	
Lab Manager Contact Information		Phone/Fax:	423-751-3753		Sampling Team Number:	1	
Lab PM:	Gail Lage	Site PM Email:	jiquinn@tva.gov		Send EDD/Hard Copy to:	tva-el@envsld.com	
Phone/Fax:	615-301-5741/615-726-3404	Lab Email:	Gail.Lage@testamericainc.com				

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	
			Start Depth	End Depth								
			Depth Unit	Select Unit								
1	CUF-BS-BG02-1.5/3.5-20180822	BG-02	1.5	3.5	S	G	N	8/22/2018	1109	2	Loc: 490 15789?	X
2	CUF-BS-BG02-5.0/7.6-20180822	BG-02	5.0	7.6	S	G	N	8/22/2018	1125	2		X
3	CUF-BS-FB02-20180822	BG-02	NA	NA	W	G	FB	8/22/2018	1147	2		X
4	CUF-BS-BG02-0/0.5-20180822	BG-02	0	0.5	S	G	N	8/22/2018	1156	2		X
5	CUF-BS-BG03-1.2/3.2-20180822	BG-03	1.2	3.2	S	G	N	8/22/2018	1457	2		X
6	CUF-BS-BG03-5.2/7.2-20180822	BG-03	5.2	7.2	S	G	N	8/22/2018	1526	2		X
7	CUF-BS-BG03-0/0.5-20180822	BG-03	0	0.5	S	G	N	8/22/2018	1531	2		X
8												
9												
10												
11												
12												
13												

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			
Suema Bolden <i>Bolden</i>		8/22/2018	1730	M. J. TAN 8/22/18 1745				<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
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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 20180822 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:	Suama Boldon & Walker Padgett
Lab Address:	29360 Foster Creighton Dr Nashville, TN 37204	Project #:	177565209	Sampling Company:	Stantec
		Site Address:	815 Cumberland City Road	Address:	Warehouse Row North 1110 Market Street, Suite 214A
		City:	Cumberland City TN, 37763	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:	1
Phone/Fax:	615-301-5741/615-726-3404	Site PM Email:	jquinn@tva.gov	Send EDD/Hard Copy to:	tva-pj@envista.com
Lab Email:	Gail.Lage@testamericanc.com				

ITEM #	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 ID	MS/MSD
			Start Depth	End Depth							
1	CUF-BS-BG02-1.5/3.5-20180822	BG-02	1.5	3.5	S	G	N	8/22/2018	1109	2	
2	CUF-BS-BG02-5.0/7.6-20180822	BG-02	5.0	7.6	S	G	N	8/22/2018	1125	2	
3	CUF-BS-FB02-20180822	BG-02	NA	NA	W	G	FB	8/22/2018	1147	2	
4	CUF-BS-BG02-0/0.5-20180822	BG-02	0	0.5	S	G	N	8/22/2018	1156	2	
5	CUF-BS-BG03-1.2/3.2-20180822	BG-03	1.2	3.2	S	G	N	8/22/2018	1457	2	
6	CUF-BS-BG03-5.2/7.2-20180822	BG-03	5.2	7.2	S	G	N	8/22/2018	1526	2	
7	CUF-BS-BG03-0/0.5-20180822	BG-03	0	0.5	S	G	N	8/22/2018	1531	2	
8											
9											
10											
11											
12											
13											

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 Boldon	<i>S. Boldon</i>	8/22/2018	1730	Andy Johnson	TAN	8/22/18	1945	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
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SHIPPING METHOD:		SAMPLER NAME AND SIGNATURE						Temperature In °C	Sample on Ice?	Sample intact?	Trap Blank?
carrier		<i>Suama Boldon S. Boldon</i>									

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 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 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
TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

2960 Foster Creighton Drive
Nashville, TN 37204
Tel 615-301-5741 | Fax 615-726-3404
www.testamericainc.com

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

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: 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
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: 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
Environmental Standards, Inc.
1140 Valley Forge Road • PO Box 810 • Valley Forge, PA 19482
610.935.5577 ext. 408 • www.envstd.com • acover@envstd.com

Emergency Response Quality Assurance Hotline: 855.374.7272

