

**Data Validation Report
Tennessee Valley Authority
Allen Fossil Plant
Environmental Investigation Plan
Background Soil Samples
Chain-of-Custody Number: ALF_BS_20190816_1A**

This quality assurance (QA) review is based upon an examination of the data generated from the analyses of the seven background soil samples and one aqueous blank collected on August 16, 2019, at the Tennessee Valley Authority (TVA) Allen Fossil Plant facility. These samples were collectively analyzed by Eurofins TestAmerica, of Pittsburgh, Pennsylvania, for total metals by SW-846 Method 6020A; for total mercury by SW-846 Methods 7470A/7471B; for anions (specifically, chloride, fluoride, and sulfate) by SW-846 Method 9056A; for pH by SW-846 Method 9045D; and for fractional organic carbon (FOC) by ASTM D2974.

This review was performed in accordance with the Environmental Investigation Plan for the Tennessee Valley Authority Allen Fossil Plant Environmental Investigation (ALF EIP; Revision 3, March 3, 2019). 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 and ASTM 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 and ASTM 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 Eurofins TestAmerica Job Number 180-94275-1.

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

Sample Identification	Laboratory Sample Identification	Job Number	Matrix	Date Sample Collected	Parameters Examined
ALF-BS-FB08-20190816 (Field Blank)	180-94275-1	180-94275-1	Aq	8/16/19	M, Hg, A
ALF-BS-BG09-1.5/3.5-20190816	180-94275-2	180-94275-1	Soil	8/16/19	M, Hg, A, pH, FOC
ALF-BS-BG09-6.5/8.5-20190816	180-94275-3	180-94275-1	Soil	8/16/19	M, Hg, A, pH, FOC
ALF-BS-BG09-11.5/13.5-20190816	180-94275-4	180-94275-1	Soil	8/16/19	M, Hg, A, pH, FOC
ALF-BS-BG09-16.5/18.5-20190816	180-94275-5	180-94275-1	Soil	8/16/19	M, Hg, A, pH, FOC
ALF-BS-BG09-21.5/23.5-20190816	180-94275-6	180-94275-1	Soil	8/16/19	M, Hg, A, pH, FOC
ALF-BS-BG09-26.5/28.5-20190816	180-94275-7	180-94275-1	Soil	8/16/19	M, Hg, A, pH, FOC
ALF-BS-BG09-0.0/0.5-20190816	180-94275-8	180-94275-1	Soil	8/16/19	M, Hg, A, pH, FOC

Parameters Examined

- M - Total Metals by SW-846 Method 6020A.
Hg - Total 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.
FOC - Fractional Organic Carbon by ASTM D2974.
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
Laboratory Control Sample (LCS) Results	Sample Preparation
Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results	Post-Digestion Spike Results
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 EIP.
- MS/MSD, post-digestion spike, laboratory duplicate, and/or serial dilution analyses were performed on a non-project sample(s). Qualification of data due to this issue was not warranted.

Qualifier Summary

Analyte(s)	Job Number	Sample(s)	Validation Qualifier	Reason(s) for Qualification
lead and thallium	180-94275-1	ALF-BS-BG09-26.5/28.5-20190816	J	I
antimony and calcium	180-94275-1	All samples, except ALF-BS-FB08-20190816	J	M-
zinc	180-94275-1	All samples, except ALF-BS-FB08-20190816	J	M+, P+

Unless otherwise qualified, all positive results reported between the method detection limit (MDL) and quantitation limit (QL) should be considered estimated and have been flagged "J" on the data tables. (Reason Code: RL)

Review performed by: Jessica Mayberry, Quality Assurance Chemist

Review reviewed by: Andrew L. Piasecki, Senior Quality Assurance Chemist

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

Date review completed: 10/9/19

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	180-94275-1									
				Sys Sample Code	ALF-BS-FB08-20190816									
				Sample Name	ALF-BS-FB08-20190816									
				Sample Date	8/16/2019 7:43:00 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		0.000378	0.000378	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		0.00160	0.00160	0.0100	N	Yes	1	NA
	Beryllium	7440-41-7	T	MG/L		U		0.000182	0.000182	0.00100	N	Yes	1	NA
	Boron	7440-42-8	T	MG/L		U		0.0386	0.0386	0.0800	N	Yes	1	NA
	Cadmium	7440-43-9	T	MG/L		U		0.000125	0.000125	0.00100	N	Yes	1	NA
	Calcium	7440-70-2	T	MG/L		U		0.127	0.127	0.500	N	Yes	1	NA
	Chromium	7440-47-3	T	MG/L		U		0.00153	0.00153	0.00200	N	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		0.000627	0.000627	0.00200	N	Yes	1	NA
	Lead	7439-92-1	T	MG/L		U		0.000128	0.000128	0.00100	N	Yes	1	NA
	Lithium	7439-93-2	T	MG/L		U		0.00339	0.00339	0.00500	N	Yes	1	NA
	Molybdenum	7439-98-7	T	MG/L		U		0.000610	0.000610	0.00500	N	Yes	1	NA
	Nickel	7440-02-0	T	MG/L		U		0.000336	0.000336	0.00100	N	Yes	1	NA
	Selenium	7782-49-2	T	MG/L		U		0.00151	0.00151	0.00500	N	Yes	1	NA
	Silver	7440-22-4	T	MG/L		U		0.000177	0.000177	0.00100	N	Yes	1	NA
	Thallium	7440-28-0	T	MG/L		U		0.000148	0.000148	0.00100	N	Yes	1	NA
	Vanadium	7440-62-2	T	MG/L		U		0.000991	0.000991	0.00100	N	Yes	1	NA
	Zinc	7440-66-6	T	MG/L		U		0.00322	0.00322	0.00500	N	Yes	1	NA
SW-846 7470A	Mercury	7439-97-6	T	MG/L	0.000103	J	RL	0.000101	0.000101	0.000200	Y	Yes	1	NA
SW-846 9056A	Chloride	16887-00-6	N	MG/L		U		0.715	0.715	1.00	N	Yes	1	NA
	Fluoride	16984-48-8	N	MG/L		U		0.0263	0.0263	0.100	N	Yes	1	NA
	Sulfate	14808-79-8	N	MG/L	0.444	J	RL	0.380	0.380	1.00	Y	Yes	1	NA

				Lab Sample ID	180-94275-2									
				Sys Sample Code	ALF-BS-BG09-1.5/3.5-20190816									
				Sample Name	ALF-BS-BG09-1.5/3.5-20190816									
				Sample Date	8/16/2019 8:31:00 AM									
				Location	ALF-BG09									
				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:			%	17.2									
ASTM D2974-87	Fractional Organic	FOC	N	%	1.4			0.5	0.5	0.5	Y	Yes	1	NA
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.467	J	M-	0.0788	0.0788	0.254	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	3.59			0.0330	0.0330	0.127	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	121			0.163	0.163	1.27	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.680			0.00953	0.00953	0.127	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	6.60	J	RL	1.72	1.72	10.2	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.374			0.0216	0.0216	0.127	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	5140	J	M-	11.4	11.4	63.5	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	12.9			0.105	0.105	0.254	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	6.93			0.0105	0.0105	0.0635	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	11.5			0.144	0.144	0.254	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	12.6			0.0445	0.0445	0.127	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	9.81			0.351	0.351	0.635	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	0.742			0.207	0.207	0.635	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	16.6			0.0775	0.0775	0.127	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	1.06			0.155	0.155	0.635	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0536	J	RL	0.0343	0.0343	0.127	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.474			0.0318	0.0318	0.127	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	20.4			0.0813	0.0813	0.127	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	52.8	J	M+,P+	0.424	0.424	0.635	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG		U		0.0179	0.0179	0.0412	N	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	8.0			0.1	0.1	0.1	Y	Yes	1	NA
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		4.68	4.68	12.0	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG	3.42			0.819	0.819	1.20	Y	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG	15.8			8.18	8.18	12.0	Y	Yes	1	DRY

	Lab Sample ID	180-94275-3												
	Sys Sample Code	ALF-BS-BG09-6.5/8.5-20190816												
	Sample Name	ALF-BS-BG09-6.5/8.5-20190816												
	Sample Date	8/16/2019 8:54:00 AM												
	Location	ALF-BG09												
	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:			%	24.9									
ASTM D2974-87	Fractional Organic	FOC	N	%	1.1			0.5	0.5	0.5	Y	Yes	1	NA
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.282	J	M-	0.0826	0.0826	0.266	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	4.60			0.0346	0.0346	0.133	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	127			0.170	0.170	1.33	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.491			0.00999	0.00999	0.133	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	5.08	J	RL	1.80	1.80	10.7	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.187			0.0226	0.0226	0.133	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	13200	J	M-	11.9	11.9	66.6	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	8.19			0.111	0.111	0.266	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	4.38			0.0111	0.0111	0.0666	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	9.66			0.150	0.150	0.266	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	8.22			0.0466	0.0466	0.133	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	6.88			0.368	0.368	0.666	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	0.613	J	RL	0.217	0.217	0.666	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	11.6			0.0812	0.0812	0.133	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.447	J	RL	0.162	0.162	0.666	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0380	J	RL	0.0360	0.0360	0.133	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.299			0.0333	0.0333	0.133	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	14.1			0.0852	0.0852	0.133	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	31.2	J	M+,P+	0.445	0.445	0.666	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG		U		0.0181	0.0181	0.0419	N	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	7.9			0.1	0.1	0.1	Y	Yes	1	NA
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		5.08	5.08	13.1	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG	3.49			0.891	0.891	1.31	Y	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG	13.9			8.89	8.89	13.1	Y	Yes	1	DRY

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
	Percent Moisture:			%	31.9									
ASTM D2974-87	Fractional Organic	FOC	N	%	1.4			0.5	0.5	0.5	Y	Yes	1	NA
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.310	J	M-	0.0928	0.0928	0.300	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	2.96			0.0389	0.0389	0.150	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	176			0.192	0.192	1.50	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.602			0.0112	0.0112	0.150	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	7.12	J	RL	2.02	2.02	12.0	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.276			0.0255	0.0255	0.150	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	15500	J	M-	13.4	13.4	74.9	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	10.6			0.124	0.124	0.300	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	5.40			0.0124	0.0124	0.0749	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	12.5			0.169	0.169	0.300	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	10.2			0.0524	0.0524	0.150	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	9.77			0.413	0.413	0.749	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	0.507	J	RL	0.244	0.244	0.749	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	14.2			0.0913	0.0913	0.150	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	1.26			0.183	0.183	0.749	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0514	J	RL	0.0404	0.0404	0.150	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.305			0.0374	0.0374	0.150	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	19.3			0.0958	0.0958	0.150	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	40.3	J	M+,P+	0.500	0.500	0.749	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG		U		0.0206	0.0206	0.0476	N	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	7.9			0.1	0.1	0.1	Y	Yes	1	NA
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		5.60	5.60	14.4	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG	2.15			0.981	0.981	1.44	Y	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG	20.3			9.80	9.80	14.4	Y	Yes	1	DRY

				Lab Sample ID	180-94275-5									
				Sys Sample Code	ALF-BS-BG09-16.5/18.5-20190816									
				Sample Name	ALF-BS-BG09-16.5/18.5-20190816									
				Sample Date	8/16/2019 9:34:00 AM									
				Location	ALF-BG09									
				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:			%	27.4									
ASTM D2974-87	Fractional Organic	FOC	N	%	2.0			0.5	0.5	0.5	Y	Yes	1	NA
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.250	J	M-	0.0845	0.0845	0.273	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	3.09			0.0355	0.0355	0.136	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	127			0.175	0.175	1.36	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.609			0.0102	0.0102	0.136	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	7.08	J	RL	1.84	1.84	10.9	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.206			0.0232	0.0232	0.136	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	7310	J	M-	12.2	12.2	68.2	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	10.8			0.113	0.113	0.273	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	5.94			0.0113	0.0113	0.0682	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	13.6			0.154	0.154	0.273	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	9.95			0.0477	0.0477	0.136	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	10.1			0.376	0.376	0.682	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	0.465	J	RL	0.222	0.222	0.682	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	14.9			0.0832	0.0832	0.136	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.986			0.166	0.166	0.682	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0487	J	RL	0.0368	0.0368	0.136	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.268			0.0341	0.0341	0.136	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	17.9			0.0873	0.0873	0.136	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	42.8	J	M+,P+	0.455	0.455	0.682	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG	0.0263	J	RL	0.0182	0.0182	0.0420	Y	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	7.5			0.1	0.1	0.1	Y	Yes	1	NA
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		5.27	5.27	13.6	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG	1.99			0.924	0.924	1.36	Y	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG	13.7			9.23	9.23	13.6	Y	Yes	1	DRY

				Lab Sample ID	180-94275-6									
				Sys Sample Code	ALF-BS-BG09-21.5/23.5-20190816									
				Sample Name	ALF-BS-BG09-21.5/23.5-20190816									
				Sample Date	8/16/2019 9:53:00 AM									
				Location	ALF-BG09									
				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:			%	28.6									
ASTM D2974-87	Fractional Organic	FOC	N	%	2.4			0.5	0.5	0.5	Y	Yes	1	NA
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.281	J	M-	0.0827	0.0827	0.267	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	7.44			0.0347	0.0347	0.133	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	169			0.171	0.171	1.33	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.778			0.0100	0.0100	0.133	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	8.90	J	RL	1.80	1.80	10.7	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.328			0.0227	0.0227	0.133	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	9230	J	M-	11.9	11.9	66.7	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	13.8			0.111	0.111	0.267	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	7.62			0.0111	0.0111	0.0667	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	16.6			0.151	0.151	0.267	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	13.9			0.0467	0.0467	0.133	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	13.5			0.368	0.368	0.667	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	0.939			0.217	0.217	0.667	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	19.2			0.0814	0.0814	0.133	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	1.19			0.163	0.163	0.667	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0732	J	RL	0.0360	0.0360	0.133	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.321			0.0333	0.0333	0.133	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	22.0			0.0854	0.0854	0.133	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	58.1	J	M+,P+	0.446	0.446	0.667	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG	0.0328	J	RL	0.0188	0.0188	0.0433	Y	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	8.0			0.1	0.1	0.1	Y	Yes	1	NA
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		5.33	5.33	13.7	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG	2.34			0.934	0.934	1.37	Y	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG	27.1			9.33	9.33	13.7	Y	Yes	1	DRY

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
	Percent Moisture:			%	27.0									
ASTM D2974-87	Fractional Organic	FOC	N	%	2.7			0.5	0.5	0.5	Y	Yes	1	NA
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.339	J	M-	0.0825	0.0825	0.266	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	9.30			0.0346	0.0346	0.133	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	183			0.170	0.170	1.33	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.945			0.00998	0.00998	0.133	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	10.5	J	RL	1.80	1.80	10.6	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.401			0.0226	0.0226	0.133	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	14600	J	M-	11.9	11.9	66.5	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	15.1			0.110	0.110	0.266	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	11.1			0.0110	0.0110	0.0665	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	21.2			0.150	0.150	0.266	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	14.9	J	I	0.0466	0.0466	0.133	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	14.6			0.367	0.367	0.665	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	1.40			0.217	0.217	0.665	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	22.8			0.0812	0.0812	0.133	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	1.66			0.162	0.162	0.665	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0874	J	RL	0.0359	0.0359	0.133	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.372	J	I	0.0333	0.0333	0.133	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	25.2			0.0852	0.0852	0.133	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	63.2	J	M+,P+	0.444	0.444	0.665	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG	0.0263	J	RL	0.0187	0.0187	0.0431	Y	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	8.0			0.1	0.1	0.1	Y	Yes	1	NA
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		5.18	5.18	13.4	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG	2.26			0.908	0.908	1.34	Y	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG	22.5			9.07	9.07	13.4	Y	Yes	1	DRY

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
	Percent Moisture:			%	20.2									
ASTM D2974-87	Fractional Organic	FOC	N	%	3.1			0.5	0.5	0.5	Y	Yes	1	NA
SW-846 6020A	Antimony	7440-36-0	T	MG/KG	0.296	J	M-	0.0785	0.0785	0.253	Y	Yes	1	DRY
	Arsenic	7440-38-2	T	MG/KG	6.38			0.0329	0.0329	0.127	Y	Yes	1	DRY
	Barium	7440-39-3	T	MG/KG	110			0.162	0.162	1.27	Y	Yes	1	DRY
	Beryllium	7440-41-7	T	MG/KG	0.707			0.00949	0.00949	0.127	Y	Yes	1	DRY
	Boron	7440-42-8	T	MG/KG	6.35	J	RL	1.71	1.71	10.1	Y	Yes	1	DRY
	Cadmium	7440-43-9	T	MG/KG	0.213			0.0215	0.0215	0.127	Y	Yes	1	DRY
	Calcium	7440-70-2	T	MG/KG	4060	J	M-	11.3	11.3	63.3	Y	Yes	1	DRY
	Chromium	7440-47-3	T	MG/KG	12.9			0.105	0.105	0.253	Y	Yes	1	DRY
	Cobalt	7440-48-4	T	MG/KG	5.49			0.0105	0.0105	0.0633	Y	Yes	1	DRY
	Copper	7440-50-8	T	MG/KG	14.1			0.143	0.143	0.253	Y	Yes	1	DRY
	Lead	7439-92-1	T	MG/KG	10.0			0.0443	0.0443	0.127	Y	Yes	1	DRY
	Lithium	7439-93-2	T	MG/KG	8.44			0.349	0.349	0.633	Y	Yes	1	DRY
	Molybdenum	7439-98-7	T	MG/KG	0.802			0.206	0.206	0.633	Y	Yes	1	DRY
	Nickel	7440-02-0	T	MG/KG	13.9			0.0772	0.0772	0.127	Y	Yes	1	DRY
	Selenium	7782-49-2	T	MG/KG	0.853			0.154	0.154	0.633	Y	Yes	1	DRY
	Silver	7440-22-4	T	MG/KG	0.0402	J	RL	0.0342	0.0342	0.127	Y	Yes	1	DRY
	Thallium	7440-28-0	T	MG/KG	0.207			0.0316	0.0316	0.127	Y	Yes	1	DRY
	Vanadium	7440-62-2	T	MG/KG	19.6			0.0810	0.0810	0.127	Y	Yes	1	DRY
	Zinc	7440-66-6	T	MG/KG	39.0	J	M+,P+	0.423	0.423	0.633	Y	Yes	1	DRY
SW-846 7471B	Mercury	7439-97-6	T	MG/KG		U		0.0173	0.0173	0.0400	N	Yes	1	DRY
SW-846 9045D	pH at 25 Degrees C	PH	N	SU	7.8			0.1	0.1	0.1	Y	Yes	1	NA
SW-846 9056A	Chloride	16887-00-6	N	MG/KG		U		4.77	4.77	12.3	N	Yes	1	DRY
	Fluoride	16984-48-8	N	MG/KG	1.48			0.836	0.836	1.23	Y	Yes	1	DRY
	Sulfate	14808-79-8	N	MG/KG	9.37	J	RL	8.35	8.35	12.3	Y	Yes	1	DRY

SECTION 3

SUPPORTING DOCUMENTATION FOR QUALIFIERS



INORGANIC ANALYSIS SUPPORT DOCUMENTATION

ESI project name: TVA SHF
 Sample Collection Dates: 8/16/2019
 Job Number: 20188318.A000
 Project Manager: Amanda Cover
 Laboratory: Eurofins TA- Pitt

Reviewed by: JM
 Approved by: AP
 Completion Date: 10/20/19

Applicable Sample No's (x)

Refer to Table 1 in the Quality Assurance Review

Deliverable:			SDG No.	Lab Control No.
	CLP-like(Full)	()	180-94275-1	
Level IV (Full)	(x)			
Limited	()			
Other:				

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

	Criteria Examined in Detail						Problems Identified						Support Documentation Attachments					
	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					
	Metals	Mercury	Gen Chem				Metals	Mercury	Gen Chem				Metals	Mercury	Gen Chem			
Holding Times	x	x	x															
Blank Analysis Results	x	x	x															
Matrix Spike (Predigestion) Results	x	x	x				x						x					
Duplicate Analysis: () Field (x) Lab				x														
Quantitation of Results	x	x	x															
Detection Limit/Sensitivity	x	x	x															
Initial Calibrations	x	x	x															
Continuing Calibrations	x	x	x															
Laboratory Control Standard (LCS)	x	x	x															
ICP Linear Range Analysis	x																	
ICP Interference Checks																		
ICP Serial Dilutions	x																	
ICP/ICPMS Post-Digestion Spike	x				x								x					
ICPMS Internal Standards	x																	
GFAA Post Digestion Spikes																		
GFAA Duplicate Injections																		
ICP Multiple Exposures																		
GFAA Standard Additions																		
CRDL Standards	x	x	x															
Condition on Receipt	x	x	x															
Percent Solids	x	x	x															
Others:																		

Comments:

Not associated

FORM III
HPLC/IC MATRIX SPIKE RECOVERY

Lab Name: Eurofins TestAmerica, Pittsburgh Job No.: 180-94275-1

SDG No.: _____

Matrix: Solid (Soluble) Level: Low Lab File ID: 08-28-2019-11.d

Lab ID: 180-94380-B-2-C MS Client ID: _____

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONCENTRATION (mg/Kg)	MS CONCENTRATION (mg/Kg)	MS % REC	QC LIMITS REC	#
Chloride	293	24.6	301.4	95	80-120	
Fluoride	14.6	1.86	10.20	57	80-120	F1
Sulfate	293	69.9	366.6	101	80-120	

✓

No qual; not associated

Column to be used to flag recovery and RPD values

FORM III EPA 9056A

FORM III
HPLC/IC MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Pittsburgh Job No.: 180-94275-1

SDG No.: _____

Matrix: Water Level: Low Lab File ID: A-ICS2100 A 08-27-2019-36.d

Lab ID: 180-94687-B- MSD Client ID: _____

COMPOUND	SPIKE ADDED (mg/L)	MSD CONCENTRATION (mg/L)	MSD % REC	RPD	QC LIMITS		#
					RPD	REC	
Chloride	25.0	36.82	102	6	15	80-120	
Fluoride	1.25	1.266	101	6	15	80-120	
Sulfate	25.0	45.48	104	7	15	80-120	

Not associated; no val

Column to be used to flag recovery and RPD values

FORM III EPA 9056A

FORM III
HPLC/IC MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Pittsburgh Job No.: 180-94275-1

SDG No.: _____

Matrix: Solid (Soluble) Level: Low Lab File ID: 08-28-2019-12.d

Lab ID: 180-94380-1-2-D MSD Client ID: _____

COMPOUND	SPIKE ADDED (mg/Kg)	MSD CONCENTRATION (mg/Kg)	MSD %	%	QC LIMITS		#
					REC	RPD	
Chloride	292	304.6	96	1	15	80-120	
Fluoride	14.6	9.953	55	3	15	80-120	F1
Sulfate	292	355.4	98	3	15	80-120	

Not associated; no qual

Column to be used to flag recovery and RPD values

FORM III EPA 9056A

2A-TN
CALIBRATION VERIFICATIONS
METALS

70-130%

Lab Name: Eurofins TestAmerica, Pittsburgh Job No.: 180-94275-1

SDG No.:

ICV Source: MCRIX A_00091

Concentration Units: ug/L

CCV Source: MCRIX A 00091

Analyte	ICVL 180-289673/7 08/28/2019 20:38				CCVL 180-289673/76 08/29/2019 02:33							
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Antimony	1.705	J	2.00	85	1.741	J	2.00	87				
Arsenic	0.8810	J	1.00	88	0.9280	J	1.00	93				
Barium	9.822	J	10.0	98	9.428	J	10.0	94				
Beryllium	0.9190	J	1.00	92	0.9337	J	1.00	93				
Boron	74.76	J	80.0	93	76.15	J	80.0	95				
Cadmium	0.8720	J	1.00	87	1.160		1.00	116				
Calcium	489.2	J	500	98	479.1	J	500	96				
Chromium	1.945	J	2.00	97	1.766	J	2.00	88				
Cobalt	0.5320		0.500	106	0.4277	J	0.500	86				
Copper	2.227		2.00	111	1.795	J	2.00	90				
Lead	0.9820	J	1.00	98	1.010		1.00	101				
Lithium	5.317		5.00	106	5.615		5.00	112				
Molybdenum	5.073		5.00	101	4.883	J	5.00	98				
Nickel	1.086		1.00	109	0.9690	J	1.00	97				
Selenium	4.000	J	5.00	80	5.188		5.00	104				
Silver	0.9607	J	1.00	96	0.9197	J	1.00	92				
Thallium	0.9607	J	1.00	96	0.9217	J	1.00	92				
Vanadium	ND		1.00	92	ND		1.00	86				
Zinc	5.033		5.00	101	4.571	J	5.00	91				

0.91733

0.86364

No qual

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

ICVL 3300930 8/28/2019 8:38:26 PM QC Status: PASS (Initial: PASS)

User Pre-dilution: 1.000

Run	Time	6Li	7Li	9Be	10B	11B	13C	23Na	25Mg
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:38:34	93.162%	6.467	0.872	71.880	74.130	0.000	556.300	518.700
2	20:38:42	94.379%	4.344	1.010	69.650	74.420	0.000	561.100	525.700
3	20:38:50	89.767%	5.141	0.875	75.510	75.740	0.000	560.000	524.500
x		92.436%	106.344%	91.876%	1446.920%	1495.245%	0.000	698.901%	522.962%
σ		2.390%	n/a	n/a	n/a	n/a	0.000	n/a	n/a
%RSD		2.586	20.160	8.585	4.090	1.148	0.000	0.449	0.718
Run	Time	26Mg	27Al	28Si	37Cl	39K	43Ca	44Ca	45Sc
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:38:34	519.500	29.630	507.000	0.000	548.900	488.600	483.800	96.719%
2	20:38:42	529.000	30.270	499.200	0.000	559.700	506.600	482.600	96.258%
3	20:38:50	524.200	31.280	512.300	0.000	552.300	549.700	501.300	96.486%
x		524.241%	101.326%	101.238%	0.000	553.640%	514.972%	489.232%	96.488%
σ		n/a	n/a	n/a	0.000	n/a	n/a	n/a	0.231%
%RSD		0.904	2.737	1.300	0.000	0.991	6.098	2.139	0.239
Run	Time	47Ti	51V	52Cr	55Mn	56Fe	57Fe	59Co	60Ni
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:38:34	4.879	0.813	2.009	5.003	53.200	56.350	0.591	1.062
2	20:38:42	4.860	1.026	1.983	5.102	55.010	62.500	0.540	0.985
3	20:38:50	5.288	0.913	1.843	5.276	54.800	67.200	0.465	1.211
x		100.1/9%	91.732%	97.251%	102.541%	108.671%	124.033%	106.429%	108.591%
σ		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
%RSD		4.826	11.660	4.606	2.688	1.828	8.769	11.920	10.560
Run	Time	63Cu	65Cu	66Zn	68Zn	75As	78Se	82Se	83Kr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:38:34	2.089	2.126	4.888	4.019	0.822	2.874	3.194	0.000
2	20:38:42	2.144	2.371	5.056	5.880	0.939	3.210	4.106	0.000
3	20:38:50	1.958	2.185	5.156	4.500	0.882	5.916	7.144	0.000
x		103.180%	111.371%	100.662%	95.993%	88.121%	80.000%	96.293%	0.000
σ		n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.000
%RSD		4.621	5.732	2.697	20.130	6.629	41.690	12.960	0.000
Run	Time	88Sr	89Y	95Mo	98Mo	103Rh	107Ag	109Ag	111Cd
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:38:34	5.437	88.299%	5.490	5.139	90.813%	0.914	0.988	0.755
2	20:38:42	4.996	92.615%	5.001	4.964	95.137%	0.992	0.906	1.016
3	20:38:50	4.940	95.335%	5.067	5.115	97.063%	0.976	0.964	0.845
x		102.485%	92.083%	103.716%	101.451%	94.338%	96.064%	95.278%	87.219%
σ		n/a	3.548%	n/a	n/a	3.201%	n/a	n/a	n/a
%RSD		5.306	3.853	5.115	1.872	3.393	4.307	4.474	15.230
Run	Time	114Cd	115In	118Sn	121Sb	123Sb	135Ba	137Ba	159Tb
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:38:34	1.084	90.358%	5.570	1.519	1.600	9.532	9.538	89.295%
2	20:38:42	0.975	96.488%	5.205	1.870	1.661	9.270	10.690	92.603%
3	20:38:50	1.077	98.738%	5.100	1.726	1.687	9.268	9.239	95.774%
x		104.520%	95.195%	105.826%	85.255%	82.461%	93.566%	98.239%	92.558%
σ		n/a	4.337%	n/a	n/a	n/a	n/a	n/a	3.240%
%RSD		5.799	4.556	4.663	10.330	2.734	1.625	7.822	3.501
Run	Time	203Tl	205Tl	206Pb	207Pb	208Pb	209Bi		
		ppb	ppb	ppb	ppb	ppb	ppb		
1	20:38:34	0.961	0.940	1.024	1.045	1.021	81.333%		
2	20:38:42	1.004	0.978	0.968	0.999	0.960	87.672%		
3	20:38:50	0.970	0.960	1.007	0.954	0.965	90.694%		
x		97.827%	96.050%	99.983%	99.951%	98.200%	86.566%		
σ		n/a	n/a	n/a	n/a	n/a	4.778%		
%RSD		2.311	2.002	2.892	4.557	3.451	5.519		

CCVL 3300930 8/29/2019 2:33:59 AM QC Status: PASS (Initial: PASS)

User Pre-dilution: 1.000 ✓

Run	Time	6Li ppb	7Li ppb	9Be ppb	10B ppb	11B ppb	13C ppb	23Na ppb	25Mg ppb
1	02:34:07	94.896%	4.965	0.997	71.920	74.110	0.000	489.100	502.900
2	02:34:15	93.494%	5.300	0.654	79.620	76.420	0.000	488.200	496.500
3	02:34:23	94.527%	6.581	1.150	74.490	77.920	0.000	492.900	523.400
x		94.305%	112.311%	93.337%	1506.865%	1522.988%	0.000	612.618%	507.598%
σ		0.727%	n/a	n/a	n/a	n/a	0.000	n/a	n/a
%RSD		0.771	15.180	27.220	5.203	2.520	0.000	0.509	2.765
Run	Time	26Mg ppb	27Al ppb	28Si ppb	37Cl ppb	39K ppb	43Ca ppb	44Ca ppb	45Sc ppb
1	02:34:07	495.600	35.000	492.500	0.000	492.900	446.500	473.100	106.116%
2	02:34:15	513.300	36.330	504.200	0.000	498.100	439.500	481.100	104.916%
3	02:34:23	507.000	36.630	497.800	0.000	504.500	475.000	483.100	104.298%
x		505.304%	119.959%	99.634%	0.000	498.505%	453.694%	479.083%	105.110%
σ		n/a	n/a	n/a	0.000	n/a	n/a	n/a	0.924%
%RSD		1.781	2.406	1.175	0.000	1.173	4.143	1.103	0.879
Run	Time	47Ti ppb	51V ppb	52Cr ppb	55Mn ppb	56Fe ppb	57Fe ppb	59Co ppb	60Ni ppb
1	02:34:07	4.472	0.925	1.507	4.989	49.970	38.300	0.413	1.220
2	02:34:15	4.849	0.750	1.713	4.924	46.950	49.200	0.431	0.858
3	02:34:23	4.390	0.916	2.078	4.984	51.380	53.030	0.439	0.829
x		91.413%	86.391%	88.295%	99.315%	98.870%	93.689%	85.577%	96.884%
σ		n/a							
%RSD		5.354	11.400	16.370	0.730	4.574	16.310	3.125	22.520
Run	Time	63Cu ppb	65Cu ppb	66Zn ppb	68Zn ppb	75As ppb	78Se ppb	82Se ppb	83Kr ppb
1	02:34:07	1.900	2.000	4.999	4.209	0.951	5.002	3.518	0.000
2	02:34:15	1.979	1.388	4.386	3.835	0.874	6.246	7.443	0.000
3	02:34:23	1.966	1.998	4.328	4.517	0.959	4.316	6.366	0.000
x		97.413%	89.766%	91.421%	83.734%	92.784%	103.763%	115.522%	0.000
σ		n/a	0.000						
%RSD		2.179	19.650	8.139	8.154	5.094	18.850	35.110	0.000
Run	Time	88Sr ppb	89Y ppb	95Mo ppb	98Ru ppb	103Rh ppb	107Ag ppb	109Ag ppb	111Cd ppb
1	02:34:07	5.006	88.945%	5.281	4.922	88.506%	0.933	1.059	0.927
2	02:34:15	4.672	94.746%	4.856	5.001	91.658%	0.910	0.974	1.266
3	02:34:23	4.853	95.907%	4.867	4.727	92.871%	0.916	0.897	1.288
x		96.871%	93.199%	100.027%	97.668%	91.011%	91.950%	97.675%	116.030%
σ		n/a	3.730%	n/a	n/a	2.253%	n/a	n/a	n/a
%RSD		3.462	4.002	4.841	2.893	2.475	1.275	8.301	17.410
Run	Time	114Cd ppb	115In ppb	118Sn ppb	121Sb ppb	123Sb ppb	135Ba ppb	137Ba ppb	159Tb ppb
1	02:34:07	1.032	84.747%	4.858	1.638	1.735	9.356	9.052	82.357%
2	02:34:15	1.075	87.254%	4.645	1.978	1.690	9.474	9.848	85.236%
3	02:34:23	1.113	90.049%	5.710	1.608	1.690	10.670	9.385	86.925%
x		107.340%	87.350%	101.421%	87.059%	85.240%	98.331%	94.284%	84.839%
σ		n/a	2.653%	n/a	n/a	n/a	n/a	n/a	2.310%
%RSD		3.796	3.037	11.100	11.820	1.536	7.388	4.243	2.722
Run	Time	203Tl ppb	205Tl ppb	206Pb ppb	207Pb ppb	208Pb ppb	209Bi ppb		
1	02:34:07	0.939	0.934	1.089	0.967	1.014	67.773%		
2	02:34:15	1.051	0.925	1.092	1.076	1.048	69.568%		
3	02:34:23	0.872	0.906	0.946	0.940	0.969	70.994%		
x		95.419%	92.186%	104.217%	99.452%	101.014%	69.445%		
σ		n/a	n/a	n/a	n/a	n/a	1.614%		
%RSD		9.496	1.592	8.033	7.248	3.896	2.324		

Associated w/samples

2-8

SA-IN
MATRIX SPIKE SAMPLE RECOVERY
METALS

Associated

Client ID:

Lab ID: 180-94254-A-7-B MS

Lab Name: Eurofins TestAmerica, Pittsburgh

Job No.: 180-94275-1

SDG No.:

Matrix: Solid

Concentration Units: mg/Kg

% Solids: 82.2

75-125%

Analyte	SSR C	Sample Result (SR) C	Spike Added (SA)	%R	Control Limit %R	Q	Method
Antimony	20.50	0.182 J	29.3	69	75-125	F1	EPA 6020A
Arsenic	95.45	2.32	117	80	75-125		EPA 6020A
Barium	165.3	53.5	117	96	75-125		EPA 6020A
Beryllium	56.06	0.279	58.5	95	75-125		EPA 6020A
Boron	140.7	2.93 J	146	94	75-125		EPA 6020A
Cadmium	55.19	0.273	58.5	94	75-125		EPA 6020A
Calcium	5274	4370	2930	31	75-125	F1	EPA 6020A
Chromium	64.93	6.94	58.5	99	75-125		EPA 6020A
Cobalt	58.14	3.34	58.5	94	75-125		EPA 6020A
Copper	54.13	8.40	58.5	78	75-125		EPA 6020A
Lead	63.51	7.86	58.5	95	75-125		EPA 6020A
Lithium	55.87	3.53	58.5	89	75-125		EPA 6020A
Molybdenum	54.41	0.541 J	58.5	92	75-125		EPA 6020A
Nickel	67.54	8.87	58.5	100	75-125		EPA 6020A
Selenium	101.2	0.412 J	117	86	75-125		EPA 6020A
Silver	27.50	0.0382 J	29.3	94	75-125		EPA 6020A
Thallium	112.4	0.132	117	96	75-125		EPA 6020A
Vanadium	64.30	8.73	58.5	95	75-125		EPA 6020A
Zinc	68.50	35.5	29.3	113	75-125		EPA 6020A

SSR = Spiked Sample Result

qual samples Sb & Ca "J"
(reason code: M -)

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

FORM VA - IN

5A-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
METALS

Associated

Client ID: _____ Lab ID: 180-94254-A-7-C MSD
 Lab Name: Eurofins TestAmerica, Pittsburgh Job No.: 180-94275-1
 SDG No.: _____
 Matrix: Solid Concentration Units: mg/Kg JM 9-27-19
 % Solids: 82.2 RPD $\leftarrow 20 \rightarrow 35$

Analyte	(SDR)	Spike Added (SA)	%R	Control Limit %R	RPD	RPD Limit	Q	Method
Antimony	21.82	29.8	73	75-125	6	20	F1	EPA 6020A
Arsenic	102.8	119	84	75-125	7	20		EPA 6020A
Barium	169.7	119	97	75-125	3	20		EPA 6020A
Beryllium	59.32	59.7	99	75-125	6	20		EPA 6020A
Boron	150.1	149	99	75-125	6	20		EPA 6020A
Cadmium	57.72	59.7	96	75-125	13	20		EPA 6020A
Calcium	7017	2980	89	75-125	28	20	F2	EPA 6020A
Chromium	74.00	59.7	112	75-125	13	20		EPA 6020A
Cobalt	66.21	59.7	105	75-125	13	20		EPA 6020A
Copper	58.37	59.7	84	75-125	8	20		EPA 6020A
Lead	69.89	59.7	104	75-125	10	20		EPA 6020A
Lithium	58.64	59.7	92	75-125	5	20		EPA 6020A
Molybdenum	58.19	59.7	97	75-125	7	20		EPA 6020A
Nickel	75.88	59.7	112	75-125	12	20		EPA 6020A
Selenium	115.7	119	97	75-125	13	20		EPA 6020A
Silver	28.96	29.8	97	75-125	5	20		EPA 6020A
Thallium	121.1	119	101	75-125	7	20		EPA 6020A
Vanadium	72.44	59.7	107	75-125	12	20		EPA 6020A
Zinc	75.82	29.8	135	75-125	10	20	F1	EPA 6020A

SDR = Sample Duplicate Result

Qual all samples "J" (Reason code M-) for Sb ; except for blanks
 Qual all samples "J" (Reason code: M+) except for blanks

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

FORM VD - IN

5B-IN
POST DIGESTION SPIKE SAMPLE RECOVERY
METALS

Client ID: _____

Lab ID: 180-94254-A-7-A PDS

Lab Name: Eurofins TestAmerica, Pittsburgh

Job No.: 180-94275-1

SDG No.: _____

Matrix: Solid

Concentration Units: mg/Kg

80-120%

Analyte	SSR C	Sample Result (SR) C	Spike Added (SA)	%R	Control Limit %R	Q	Method
Antimony	27.38	0.182	J	29.8	91	80-120	
Arsenic	106.6	2.32		119	87	80-120	
Barium	163.6	53.5		119	92	80-120	
Beryllium	62.33	0.279		59.7	104	80-120	
Boron	154.5	2.93	J	149	102	80-120	
Cadmium	61.39	0.273		59.7	102	80-120	
Calcium	7131	4370		2980	92	80-120	
Chromium	70.66	6.94		59.7	107	80-120	
Cobalt	66.36	3.34		59.7	106	80-120	
Copper	60.78	8.40		59.7	88	80-120	
Lead	70.31	7.86		59.7	105	80-120	
Lithium	61.21	3.53		59.7	97	80-120	
Molybdenum	61.14	0.541	J	59.7	102	80-120	
Nickel	74.03	8.87		59.7	109	80-120	
Selenium	119.2	0.412	J	119	100	80-120	
Silver	29.32	0.0382	J	29.8	98	80-120	
Thallium	127.3	0.132		119	107	80-120	
Vanadium	69.02	8.73		59.7	101	80-120	
Zinc	72.54	35.5		29.8	124	80-120	W

SSR = Spiked Sample Result

Qual all samples "J" (Reason code: P+)
except for blank

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

FORM VB - IN

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

Lab Name: Eurofins TestAmerica, Pittsburgh Job No.: 180-94275-1

SDG No.: _____

ICP-MS Instrument ID: M

Start Date: 08/28/2019 End Date: 08/29/2019

*Bi - associated
with lead and
Thallium*

Lab Sample ID	Time	Internal Standards %RI For:									
		Element Tb	Q	Element Bi	Q	Element	Q	Element	Q	Element	Q
STD1 180-289673/2 IC	20:14	100		100							
STD2 180-289673/3 IC	20:19	94		83							
STD3 180-289673/4 IC	20:24	96		88							
ICV 180-289673/5	20:28	96		96							
ICB 180-289673/6	20:33	93		86							
ICVL 180-289673/7	20:38	93		87							
ICSA 180-289673/8	20:43	93		93							
ICSAB 180-289673/9	20:48	89		76							
CCV 180-289673/10	20:52	92		88							
CCB1 180-289673/11	20:57	97		101							
CCV 180-289673/46	23:51	95		92							
CCB4 180-289673/47	23:55	92		86							
MB 180-288517/1-A	00:19	96		96							
LCS 180-288517/2-A	00:23	82		70							
CCV 180-289673/58	00:56	90		75							
CCB5 180-289673/59	01:00	91		93							
180-94254-A-7-A SD ^5	01:10	85		75							
180-94254-A-7-B MS	01:15	88		80							
180-94254-A-7-C MSD	01:19	82		60							
180-94254-A-7-A PDS	01:24	84		71							
180-94275-2	01:29	89		77							
180-94275-3	01:34	83		60							
180-94275-4	01:38	86		72							
180-94275-5	01:43	89		79							
180-94275-6	01:48	85		60							
CCV 180-289673/70	01:56	91		85							
CCB6 180-289673/71	02:01	87		72							
180-94275-7	02:06	83		59							
180-94275-8	02:11	87		79							
CCV 180-289673/74	02:19	83		64							
CCB7 180-289673/75	02:24	90		89							
CCVL 180-289673/76	02:33	85		69							

Qual

Sample -7

N

"J" (Reason code: I) for lead
and thallium

SECTION 4

CASE NARRATIVE AND CHAIN-OF-CUSTODY RECORD

Case Narrative

Client: Stantec Consulting Services Inc
Project/Site: ALF_BS_20190816_1A

Job ID: 180-94275-1

3

Job ID: 180-94275-1

Laboratory: Eurofins TestAmerica, Pittsburgh

Narrative

Job Narrative
180-94275-1

Comments

No additional comments.

Receipt

The samples were received on 8/17/2019 10:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.6° C and 2.8° C.

<6° no qual

GC Semi VOA

Method(s) 9056A: The method blank for preparation batch 180-289582 and analytical batch 180-289615 contained Chloride 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 Fluoride in preparation batch 180-289582 and analytical batch 180-289615 were outside control limits. Sample matrix interference is 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.

General Chemistry

Method(s) D2974: The sample duplicate precision for the following sample associated with analytical batch 180-289456 was outside control limits, however, the final results between sample ALF-BS-BG09-6.5/8.5-20190816 ~ ALF-BG09 (180-94275-3) and (180-94275-A-3 DU) only differ by 0.1 to 0.2%.

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

Sample Summary

Client: Stantec Consulting Services Inc
 Project/Site: ALF_BS_20190816_1A

Job ID: 180-94275-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
180-94275-1	ALF-BS-FB08-20190816 ~ NA	Water	08/16/19 07:43	08/17/19 10:30	
180-94275-2	ALF-BS-BG09-1.5/3.5-20190816 ~ ALF-BG09	Solid	08/16/19 08:31	08/17/19 10:30	
180-94275-3	ALF-BS-BG09-6.5/8.5-20190816 ~ ALF-BG09	Solid	08/16/19 08:54	08/17/19 10:30	
180-94275-4	ALF-BS-BG09-11.5/13.5-20190816 ~ ALF-BG09	Solid	08/16/19 09:15	08/17/19 10:30	
180-94275-5	ALF-BS-BG09-16.5/18.5-20190816 ~ ALF-BG09	Solid	08/16/19 09:34	08/17/19 10:30	
180-94275-6	ALF-BS-BG09-21.5/23.5-20190816 ~ ALF-BG09	Solid	08/16/19 09:53	08/17/19 10:30	
180-94275-7	ALF-BS-BG09-26.5/28.5-20190816 ~ ALF-BG09	Solid	08/16/19 10:16	08/17/19 10:30	
180-94275-8	ALF-BS-BG09-0.0/0.5-20190816 ~ ALF-BG09	Solid	08/16/19 10:40	08/17/19 10:30	

6
 Cdc has
 0900
 as received
 time

Method Summary

Client: Stantec Consulting Services Inc
Project/Site: ALF_BS_20190816_1A

Job ID: 180-94275-1

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 7470A	Mercury (CVAA)	SW846	TAL PIT
EPA 7471B	Mercury (CVAA)	SW846	TAL PIT
2540G	SM 2540G	SM22	TAL PIT
EPA 9045D	pH	SW846	TAL PIT
ASTM D2974	Moisture, Ash and Organic Matter	ASTM	TAL PIT
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT
3050B	Preparation, Metals	SW846	TAL PIT
7470A	Preparation, Mercury	SW846	TAL PIT
7471B	Preparation, Mercury	SW846	TAL PIT
DI Leach	Deionized Water Leaching Procedure	ASTM	TAL PIT

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Protocol References:

ASTM = ASTM International

SM22 = Standard Methods For The Examination Of Water And Wastewater, 22nd Edition

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058



Tennessee Valley Authority

TVA Environmental Investigations

Chain-of-Custody / Analytical Request Document

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

COOLER No.:	1	of	2
COC No.:	ALF_BS_20190816_1A		
1 of 1 Pages			
Task Desc:	ALF_BS		

Required Ship to Lab:		Required Project Information:				Required Sampler Information:							
Lab Name:	TestAmerica Pittsburgh	Site ID #:	Allen Fossil Plant			Sampler:	John Myer						
Lab Address:	301 Alpha Drive Pittsburgh, PA 15238	Project #:	175588232			Sampling Company:	Stantec						
City:	Memphis	State, Zip:	TN 38109			Address:	601 Grassmere Park Dr, Suite 22						
Lab Manager/ Contact Information	Site PM Name:			Roy Quinn			City/State:	Nashville, TN					
Lab PM:	Gail Laga			Phone/Fax:	423-751-3753			Phone:	6158851144				
Phone/Fax:	615-301-5741/615-726-3404			Site PM Email:	roy.quinn@ta.com			Send EDDI/Hard Copy to:	tva_environsamples@ta.com				
Lab Email:	Gail.Laga@testamericainc.com												
Analysis Turnaround Time													
CALENDAR DAYS					WORKING DAYS								
TAT if different from Below													
<input type="checkbox"/> 24 Hours <input type="checkbox"/> 3 Business Days <input type="checkbox"/> 5 Business Days <input checked="" type="checkbox"/> 10 Business Days													
ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth		MATRIX CODE	OF GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Analyte
			Start Depth	End Depth									
1	ALF-BS-FB08-20190816	-	NA	NA	AQ	G	FB	8/16/2019	0743	2	N/A	<input type="checkbox"/>	X
2	ALF-BS-BG09-1.5/3.5-20190816	ALF-BG09	1.5	3.5	BS	G	N	8/16/2019	0831	3	N/A	<input type="checkbox"/>	X X X
3	ALF-BS-BG09-6.5/8.5-20190816	ALF-BG09	6.5	8.5	BS	G	N	8/16/2019	0854	3	N/A	<input type="checkbox"/>	X X X
4	ALF-BS-BG09-11.5/13.5-20190816	ALF-BG09	11.5	13.5	BS	G	N	8/16/2019	0915	3	N/A	<input type="checkbox"/>	X X X
5	ALF-BS-BG09-16.5/18.5-20190816	ALF-BG09	16.5	18.5	BS	G	N	8/16/2019	0934	3	N/A	<input type="checkbox"/>	X X X
6	ALF-BS-BG09-21.5/23.5-20190816	ALF-BG09	21.5	23.5	BS	G	N	8/16/2019	0953	3	N/A	<input type="checkbox"/>	X X X
7	ALF-BS-BG09-26.5/28.5-20190816	ALF-BG09	26.5	28.5	BS	G	N	8/16/2019	1016	3	N/A	<input type="checkbox"/>	X X X
8	ALF-BS-BG09-0.0/0.5-20190816	ALF-BG09	0.0	0.5	BS	G	N	8/16/2019	1040	3	N/A	<input type="checkbox"/>	X X X
9												<input type="checkbox"/>	
10												<input type="checkbox"/>	
11												<input type="checkbox"/>	
12												<input type="checkbox"/>	
13												<input type="checkbox"/>	
Additional Comments/Special Instructions: Additional volume collected should be used for MS/MSDs.													
BACKGROUND/SOIL_BLANKS: Anions unpreserved; Metals preserved w/ HNO ₃ to pH<2													
Dep: <i>JM</i> Wgt: 10.00 LBS SHIP LAT: 0.00 HANLING: 0.00 TOTAL: 0.00													
SAMPLER NAME AND SIGNATURE: John Myer <i>John Myer</i> Date: 8/16/19													
SHIPPING METHOD: <i>Ground 8/16/19</i>													
Temperature in °C: Sample on ice? Sample intact? Trip Blank?													



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.:	ALF_BS_20190816_1A		
1 of 1	Pages		
Task Desc:	ALF_BS		

Required Site to Lab:		Required Project Information:				Required Sampler Information			
Lab Name:	TestAmerica Pittsburgh	Site ID #:	Allen Fossil Plant	Sampler:		John Myer			
Lab Address:	301 Alpha Drive Pittsburgh, PA 15236	Project #:	175568282	Sampling Company:		Stantec			
		Site Address:	2574 Plant Road Memphis, TN, 38106	Address:	601 Grassmere Park Ct, Suite 22	Nashville, TN	Phone:	6158551144	
Lab Manager Contact Information		Site PM Name:	Roy Quinn	Sampling Team Number:	1				
Lab Mgr:	Gail Lape	Phone/Fax:	423-751-3753	Sent EDDM/Email Copy to:	bsz_delivery@msn.com				
Phone/Fax:	615-301-5741/615-726-3404	Site PM Email:	gail_lape@testamerica.us						
Lab Email:	Gail_Lape@testamerica.us								

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 I.D.	MS/MSD	
			Start Depth	End Depth								
1	ALF-BS-FB08-20190816	-	NA	NA	AQ	G	FB	8/16/2019	0743	2	N/A	<input checked="" type="checkbox"/>
2	ALF-BS-BG09-1.5/3.5-20190816	ALF-BG09	1.5	3.5	BS	G	N	8/16/2019	0831	3	N/A	<input type="checkbox"/>
3	ALF-BS-BG09-6.5/8.5-20190816	ALF-BG09	6.5	8.5	BS	G	N	8/16/2019	0854	3	N/A	<input type="checkbox"/>
4	ALF-BS-BG09-11.5/13.5-20190816	ALF-BG09	11.5	13.5	BS	G	N	8/16/2019	0915	3	N/A	<input type="checkbox"/>
5	ALF-BS-BG09-16.5/18.5-20190816	ALF-BG09	16.5	18.5	BS	G	N	8/16/2019	0934	3	N/A	<input type="checkbox"/>
6	ALF-BS-BG09-21.5/23.5-20190816	ALF-BG09	21.5	23.5	BS	G	N	8/16/2019	0953	3	N/A	<input type="checkbox"/>
7	ALF-BS-BG09-26.5/28.5-20190816	ALF-BG09	26.5	28.5	BS	G	N	8/16/2019	1016	3	N/A	<input type="checkbox"/>
8	ALF-BS-BG09-0.0/0.5-20190816	ALF-BG09	0.0	0.5	BS	G	N	8/16/2019	1040	3	N/A	<input type="checkbox"/>
9												<input type="checkbox"/>
10												<input type="checkbox"/>
11												<input type="checkbox"/>
12												<input type="checkbox"/>
13												<input type="checkbox"/>

Additional Comments/Special Instructions:

Additional volume collected should be used for
MS/MSDs.

BACKGROUNDSOIL_BLANKS: Anions
unpreserved; Metals preserved w/ HNO3 to
pH<2

Carlynn Sexton
8/16/19

RELEASERED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Sample Receipt Conditions
Carlynn Sexton 8/16/19	8/16/19	14:51	John Myer 8/16/19	8/16/19	15:00	<input checked="" type="checkbox"/> Clean <input type="checkbox"/> Dry <input type="checkbox"/> N/A <input type="checkbox"/> Cool <input type="checkbox"/> Cold <input type="checkbox"/> Hot <input type="checkbox"/> Warm <input type="checkbox"/> Room Temp <input type="checkbox"/> Freezer <input type="checkbox"/> Frozen
						<input checked="" type="checkbox"/> Sample intact? <input type="checkbox"/> Trip Blank?
						Temperature in °C

Login Sample Receipt Checklist

Client: Stantec Consulting Services Inc

Job Number: 180-94275-1

Login Number: 94275

List Source: Eurofins TestAmerica, Pittsburgh

List Number: 1

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Creator: Say, Thomas C

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

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✓

Sample Login Acknowledgement

Job 180-94275-1

Client Job Description:	ALF_BS_20190816_1A	Report To:	Stantec Consulting Services Inc
Purchase Order #:	Purchase Order Requested		Bradly Toth
Work Order #:			27280 Haggerty Road
Project Manager:	Gail Lage		Suite C-11
Job Due Date:	9/3/2019		Farmington Hills, MI 48331
Job TAT:	10 Days		
Max Deliverable Level:	IV	Bill To:	Stantec Consulting Services Inc
Earliest Deliverable Due:	9/3/2019		Bradly Toth
			27280 Haggerty Road
			Suite C-11
			Farmington Hills, MI 48331

Login 180-94275

Sample Receipt:	8/17/2019 10:30:00 AM	Number of Coolers:	2
Method of Delivery:	FedEx Priority Overnight	Cooler Temperature(s) (C°):	2.8; 2.6;

Lab Sample #	Client Sample ID	Date Sampled	Matrix	Rpt Basis	Dry / Wet **
	Method				
	Method Description / Work Location				
180-94275-1	ALF-BS-FB08-20190816 ~ NA	8/16/2019 7:43:00 AM	Water		
6020A	Custom Metals / In-Lab			Total Recoverable	Wet
7470A	Mercury (CVAA) / In-Lab			Total	Wet
9056A_ORGFM_28D	Anions, Ion Chromatography / In-Lab			Total	Wet
180-94275-2	ALF-BS-BG09-1.5/3.5-20190816 ~ ALF-BG09	8/16/2019 8:31:00 AM	Solid		
6020A	Custom metals / In-Lab			Total	Dry
7471B	Mercury (CVAA) / In-Lab			Total	Dry
9045D	pH / In-Lab			Total	Wet
9056A_ORGFM_28D	Chloride, Sulfate, Fluoride / In-Lab			Soluble	Dry
D_2974	FOC / In-Lab			Total	Wet
Moisture	Percent Moisture / In-Lab			Total	Wet
180-94275-3	ALF-BS-BG09-6.5/8.5-20190816 ~ ALF-BG09	8/16/2019 8:54:00 AM	Solid		
6020A	Custom metals / In-Lab			Total	Dry
7471B	Mercury (CVAA) / In-Lab			Total	Dry
9045D	pH / In-Lab			Total	Wet
9056A_ORGFM_28D	Chloride, Sulfate, Fluoride / In-Lab			Soluble	Dry
D_2974	FOC / In-Lab			Total	Wet
Moisture	Percent Moisture / In-Lab			Total	Wet
180-94275-4	ALF-BS-BG09-11.5/13.5-20190816 ~ ALF-BG09	8/16/2019 9:15:00 AM	Solid		
6020A	Custom metals / In-Lab			Total	Dry
7471B	Mercury (CVAA) / In-Lab			Total	Dry
9045D	pH / In-Lab			Total	Wet
9056A_ORGFM_28D	Chloride, Sulfate, Fluoride / In-Lab			Soluble	Dry
D_2974	FOC / In-Lab			Total	Wet
Moisture	Percent Moisture / In-Lab			Total	Wet
180-94275-5	ALF-BS-BG09-18.5/18.5-20190816 ~ ALF-BG09	8/16/2019 9:34:00 AM	Solid		
6020A	Custom metals / In-Lab			Total	Dry
7471B	Mercury (CVAA) / In-Lab			Total	Dry
9045D	pH / In-Lab			Total	Wet
9056A_ORGFM_28D	Chloride, Sulfate, Fluoride / In-Lab			Soluble	Dry
D_2974	FOC / In-Lab			Total	Wet
Moisture	Percent Moisture / In-Lab			Total	Wet
180-94275-6	ALF-BS-BG09-21.5/23.5-20190816 ~ ALF-BG09	8/16/2019 9:53:00 AM	Solid		
6020A	Custom metals / In-Lab			Total	Dry
7471B	Mercury (CVAA) / In-Lab			Total	Dry
9045D	pH / In-Lab			Total	Wet
9056A_ORGFM_28D	Chloride, Sulfate, Fluoride / In-Lab			Soluble	Dry

* Method on-hold

** Wet/Dry indicates whether the reported results will be corrected for moisture content, and based on sample Wet weight or Dry weight

Sample Login Acknowledgement

Lab Sample #	Client Sample ID	Date Sampled	Matrix	Rpt Basis	Dry / Wet **
Method	Method Description / Work Location				
D_2974	FOC / In-Lab			Total	Wet
Moisture	Percent Moisture / In-Lab			Total	Wet
180-94275-7	ALF-BS-BG09-28.5/28.5-20190818 ~ ALF-BG09	8/16/2019 10:16:00 AM	Solid		
6020A	Custom metals / In-Lab			Total	Dry
7471B	Mercury (CVAA) / In-Lab			Total	Dry
9045D	pH / In-Lab			Total	Wet
9056A_ORGFM_28D	Chloride, Sulfate, Fluoride / In-Lab			Soluble	Dry
D_2974	FOC / In-Lab			Total	Wet
Moisture	Percent Moisture / In-Lab			Total	Wet
180-94275-8	ALF-BS-BG09-0.0/0.5-20190816 ~ ALF-BG09	8/16/2019 10:40:00 AM	Solid		
6020A	Custom metals / In-Lab			Total	Dry
7471B	Mercury (CVAA) / In-Lab			Total	Dry
9045D	pH / In-Lab			Total	Wet
9056A_ORGFM_28D	Chloride, Sulfate, Fluoride / In-Lab			Soluble	Dry
D_2974	FOC / In-Lab			Total	Wet
Moisture	Percent Moisture / In-Lab			Total	Wet

* Method on-hold

** Wet/Dry indicates whether the reported results will be corrected for moisture content, and based on sample Wet weight or Dry weight.

Login Sample Receipt Checklist

Client: Stantec Consulting Services Inc

Job Number: 180-94275-1

Login Number: 94275

List Source: Eurofins TestAmerica, Pittsburgh

List Number: 1

Creator: Say, Thomas C

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



SECTION 5

PROJECT CORRESPONDENCE

Andrew Piasecki

From: Lage, Gail <Gail.Lage@testamericaninc.com>
Sent: Wednesday, October 2, 2019 2:22 PM
To: Andrew Piasecki; CSO – TVA Projects
Cc: TVA_Deliverables; Amanda Cover; Jessica Mayberry
Subject: RE: ALF BS - Request for 180-94275-1

Andrew - Here are the answers for #1 and #3

The FOC is the organic matter X 0.58.

Sample 94275-3 Organic matter was 1.944 X 0.58= 1.12752 rounded to 1.1%

For the pH, there is no raw data, the information is entered directly into TALs for the pH readings..

Gail Lage
Senior Project Manager

Eurofins TestAmerica
2960 Foster Creighton Drive
Nashville, TN 37204
USA

Phone: 615-301-5741

From: Andrew Piasecki [mailto:apiasecki@envstd.com]
Sent: Wednesday, October 02, 2019 12:29 PM
To: CSO – TVA Projects
Cc: TVA_Deliverables; Amanda Cover; Jessica Mayberry
Subject: ALF BS - Request for 180-94275-1



Hi Gail,

Please address the following for Job 180-94275-1:

1. We're unable to recalculate the FOC results. Can you please provide an example calculation?
2. ICV/CCV and ICB/CCB summary forms were missing for the ICPMS instrument A sequence starting on 8/31/19 at 9:52.
3. For the pH analyses, can you please provide the raw data or a pH bench log, so that we can confirm the reported sample results and QC?

Please provide a revised L4 to include items 2 and 3 from this list.

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

