November 28, 2018

Roy Quinn
TVA Cumberland Fossil Plant
815 Cumberland City Road
Cumberland City, TN 37050

RE: TVA Bull Run Fossil Plant Project/175568274 – Analytical Report
RJ Lee Group Project Number AOH1052043-0

Dear Mr. Quinn,

RJ Lee Group, Inc. (RJLG) Monroeville laboratory received six samples on November 19, 2018 associated with Tennessee Valley Authority (TVA) Bull Run Fossil Plant. The samples were logged into RJ Lee Group project number AOH1052043-0 and assigned RJLG sample numbers as indicated in Appendix A.

The samples were received in good condition with all custody seals in place and intact. Attached in Appendix A is the signed sample receipt confirmation form, COC and sample receipt check list.

These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified to return the samples covered in this report, RJ Lee Group will store them for a period of ninety (90) days before discarding.

Should you have any questions regarding this information, please do not hesitate to contact us.

Sincerely,

Bryan R. Bandli, PhD
Principal Investigator

Attachments: Chain of Custody Forms
Mineral Identification Report

350 Hochberg Road, Monroeville, PA 15146 | PH: 724.325.1776 | F: 724.733.1799

Appendix A

Chain of Custody Forms

Chain of Custody
RJ Lee Group Work Order #: AOH1052043-0
Project Name/Case #: Bull Run Fossil Plant/175568274

Received From:	Relinquished To:
Suama Bolden Stantec Warehouse Row North 1110 Market Street Suite 214A Chattanooga, TN 37402 United States Email: accountspayable@tva.gov Main: 317-220-9374	RJLee Group, Inc. 350 Hochberg Road Monroeville, PA 15146 United States Main: 724-325-1776 Fax: 724-325-1775

Sample ID	Client Sample ID	Date Received
10456649	BRF-BS-BG18-0.0/0.5-20181113	11/19/2018 8:50 AM EST
10456650	BRF-BS-BG17-0.0/0.5-20181114	11/19/2018 8:50 AM EST
10456651	BRF-BS-DUP02-20181116	11/19/2018 8:50 AM EST
10456652	BRF-BS-BG07-0.0/0.5-20181114	11/19/2018 8:50 AM EST
10456653	BRF-BS-BG06-0.0/0.5-20181114	11/19/2018 8:50 AM EST
10456654	BRF-BS-BG04-0.0/0.5-20181116	11/19/2018 8:50 AM EST
10456655	QC_BRF-BS-BG07-0.0/0.5-20181114	11/19/2018 8:50 AM EST

	Received From: Suama Bolden	*Method of Shipment:* *Federal Express*	
	Company: Stantec		**Date:** 11/19/2018
	Received By: Monica Carse	*Package Condition Upon Receipt:* *Sealed*	
	Company: RJ Lee Group, Inc.		**Date:** 11/19/2018

	Relinquished	*Method of Shipment:*	
	Company:		**Date:**
	Received By:	*Package Condition Upon Receipt:*	
	Company:		**Date:**

	Relinquished	*Method of Shipment:*	
	Company:		**Date:**
	Received By:	*Package Condition Upon Receipt:*	
	Company:		**Date:**

350 Hochberg Road, Monroeville, PA 15146
Phone: (724) 325-1776 | Fax: (724) 733-1799

RJ Lee Group
Sample Receipt and Log in Check List

Client:	**Tennessee Valley Authority**	**Date Received:**	**11/19/2018**	**Log in Date:**	**11/19/2018**
Time Received:	**8:50 AM**	**By:**	**Monica Carse**	**COC#:**	**BRF_BS_20181116_1C**
Project:	**AOH1052043-0**	**# Coolers Received**	**1**	**Means of Shipment:**	**FedEx**
Air Bill:	**7838 2462 3057**				

As Received Screen	Yes	No	Comments
Were the Coolers received in good condition?	✓		
Was there evidence of tampering?		✓	
Are Custody Seals intact and in good condition?	✓		
Were Coolers received between 2 and 4 degrees C?	N/A		
Were all samples intact?	✓		
Were all samples accurately labeled?	✓		
Was the COC received in good condition?	✓		
Did the sample ID on COC match the ID on the sample jars?	✓		
Were there any discrepancies among samples and COC?		✓	
Is the COC completely filled out?	✓		
Was the COC relinquished properly?	✓		

List any anomalies associated with Sample Receipt

N/A

Analyst Signature: M. Carse 11-19-18

Manager Signature: [signature] 11-20-18

AOH1052043-0

TVA Environmental Investigations

Tennessee Valley Authority

Chain-of-Custody / Analytical Request Document

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

COOLER No.:	of
COC No:	BRF_BS_20181116_1C
1 of 1 Pages	
Task Desc:	BRF_BS

Required Ship to Lab:		Required Project Information:				Required Sampler Information			
Lab Name:	RJ Lee Group, Inc.	Site ID #:	Bull Run Fossil Plant			Sampler:	W.Padgett, S.Bolden, M.Edmunds		
Lab Address:	350 Hochberg Road	Project #:	175568274			Sampling Company:	Stantec		
	Monroeville, PA 15146	Site Address	1265 Edgemoor Rd			Address	Warehouse Row North 1110 Market Street, Suite		
		City	Clinton	State, Zip:	TN, 37716	City/State	Chattanooga	Phone:	317-220-9374
Lab Manager Contact Information		Site PM Name:	Roy Quinn						
Lab PM:	Monica Carse	Phone/Fax:	423-751-3753			Sampling Team Number:	1		
Phone/Fax:	724.325.1776	Site PM Email:				Send EDD/Hard Copy to:			
Lab Email:									

Analysis Turnaround Time

☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

- ☐ 24 Hours
- ☐ 3 Business Days
- ☑ 5 Business Days
- ☐ 10 Business Days (Standard)

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth: Depth Unit (Start Depth)	Sample Depth: Select Unit (End Depth)	MATRIX CODE	G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Filtered N	Preserve None	Analysis BACKGROUNDSOIL_PLM
1	BRF-BS-BG18-0.0/0.5-20181113	BRF-BG-18	0.0	0.5	S	G	N	11/13/2018	1159	1		☐			X
2	BRF-BS-BG17-0.0/0.5-20181114	BRF-BG-17	0.0	0.5	S	G	N	11/14/2018	0949	1		☐			X
3	BRF-BS-DUP02-20181116	-	NA	NA	S	G	FD	11/16/2018	-	1		☐			X
4	BRF-BS-BG07-0.0/0.5-20181114	BRF-BG-07	0.0	0.5	S	G	N	11/14/2018	1707	1		☐			X
5	BRF-BS-BG06-0.0/0.5-20181114	BRF-BG-06	0.0	0.5	S	G	N	11/14/2018	1304	1		☐			X
6	BRF-BS-BG04-0.0/0.5-20181116	BRF-BG-04	0.0	0.5	S	G	N	11/16/2018	1204	2		☑			X

Additional Comments/Special Instructions:

RELINQISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Suama Bolden (Stantec)	11/16/2018	1715	M Carse/RJLee GROUP	11.19.18	08:50

Sample Receipt Conditions			
☐Yes ☑No	☐Yes ☑No	☑Yes ☐No	☐Yes ☑No
☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Temperature in °C	Sample on Ice?	Sample Intact?	Trip Blank?

SHIPPING METHOD:	SAMPLER NAME AND SIGNATURE
Courier	Walker Padgett
	Suama Bolden
	Matthew Edmunds

Form TVA 30087A

Appendix B

Mineral Identification Report

RJLG RJ LeeGroup, Inc.

Mineral Identification

Polarized Light Microscopy (PLM) Laboratory Report

Roy Quinn
TVA Cumberland Fossil Plant
815 Cumberland City Road
Cumberland City , TN 37050 United States
Email: jrquinn@tva.gov
Main: 423-751-3753

Report Date: 11/26/2018
Sample Received Date: 11/19/2018
RJLG Project: AOH1052043-0
Customer COC: BRF_BS_20181116_1C
Purchase Order:
Analytical Method: Fly Ash Determination by PLM

Customer Sample # :	RJLG ID	Date Analyzed	Date Collected	Area % Fly Ash	Non-Fly Ash Components	Comments
BRF-BS-BG04-0.0/0.5-20181116	10456654	11/26/2018	11/16/2018	ND	Carbonate Opaques Quartz	Beige Sediment.
BRF-BS-BG06-0.0/0.5-20181114	10456653	11/26/2018	11/14/2018	ND	Carbonate Opaques Quartz	Beige Sediment.
BRF-BS-BG07-0.0/0.5-20181114	10456652	11/26/2018	11/14/2018	ND	Carbonate Opaques Quartz	Beige Sediment.
BRF-BS-BG17-0.0/0.5-20181114	10456650	11/26/2018	11/14/2018	ND	Carbonate Opaques Quartz	Beige Sediment.
BRF-BS-BG18-0.0/0.5-20181113	10456649	11/26/2018	11/13/2018	1%	Carbonate Opaques Quartz	Beige Sediment.
BRF-BS-DUP02-20181116	10456651	11/26/2018	11/16/2018	ND	Carbonate Opaques Quartz	Beige Sediment.
QC_BRF-BS-BG07-0.0/0.5-20181114	10456655	11/26/2018	11/14/2018	ND	NA	Beige Sediment.

Disclaimer Notes

* Samples will be returned to client immediately upon the release of final report.
* These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.
* This test report relates to the items tested.
* Any reproduction of this document must include the entire document in order for the report to be valid.
* This report may not be used to claim product endorsement by NVLAP Lab Code 101208-0 or any agency of the U.S. Government.
* Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA # 100364, NVLAP # 101208-0, NY ELAP # 10884) facility.
* If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results is limited to the reported values.
* For the purposes of this method, Fly Ash is defined as any particle consistent with Coal Ash.
* The method reporting level is 1% and anything <1% is considered a not-detected.

Quartz – Angular anisotropic particulate with low relief.
Feldspar – Angular to blocky anisotropic particulate, low to moderate relief, biaxial, can have polysynthetic twinning.
Clay – Sheet silicates with polycrystalline or display non-uniform extinction with low to moderate relief, and zero to low birefringence. Clay also refers to particles that are less than 2.0 microns.
Opaques – Opaque is a generic term for a particle that does not transmit light. Opaque minerals are distinguished from opaque bottom ash based on morphology of fracture.
Fly Ash – Isotropic to opaque spheres, agglomeration of spheres, and angular ash particles.
Organic Particulate – Pollen, plant and insect matter, and carbonaceous matter.
Carbonates – High birefringent, can be rhombohedral, with high relief.
Diatoms – Silica rich isotropic particles with various morphologies.
Mica – Sheet silicate with moderate to high relief and low birefringence, mono-crystalline, and normal extinction.
Miscellaneous Silicate – Isotropic and anisotropic silicates, with low to high relief, identification unsure and beyond the scope of the method to identify.
Amphibole – Elongated anisotropic particulate with moderate to high relief.
Coal – Irregular to angular particles with moderate opacity, edges and thin particles are reddish brown in color.
<1% Fly Ash – Fly Ash observed, none counted.
ND – No Fly Ash detected.