

April 24, 2020

**2020 Annual Inspection of CCR Facilities
Bull Run Fossil (BRF) Plant
Clinton, Anderson County, Tennessee**

Presented in this report are the results of the Tennessee Valley Authority's (TVA) annual Coal Combustion Residuals (CCR) Unit inspection required by the Environmental Protection Agency's CCR Rule. This annual inspection has been conducted, and the annual report has been prepared, in accordance with the following provisions in the CCR Rule:

- 40 CFR 257.83(b) (annual inspection requirements for CCR surface impoundments)
- 40 CFR 257.84(b) (annual inspection requirements for CCR landfills)

The 2020 annual inspection of CCR facilities at TVA's BRF Plant included review of the following structures:

- Dry Fly Ash Stack Lateral Expansion
- Main Ash Pond
- Fly Ash Stilling Pond 2C and Sluice Channel

The inspection was performed on April 8, 2020, in accordance with the BRF Inspection plan with the last annual inspection conducted March 25, 2019. The weather at the time of the inspection was fair and partly cloudy, and approximately 50 degrees. The facility received less than 0.1-inch of rain the week prior to the inspection.

The results of the field inspection (inspection forms and site layout maps) and instrumentation review are included within this report and the attached documents.

Data Review

The following documents were reviewed prior to performing the inspection.

- Main Ash Pond Stability Analysis (Stantec)
 - Static global and veneer
 - Seismic global
- Fly Ash Stilling Pond 2C Stability Analysis (Stantec)
 - Static global and veneer
 - Seismic global
- Dry Fly Ash Stack Phase 1 and Phase 2 Stability Analysis (Stantec)
 - Static global and veneer
- Dry Fly Ash Stack Lateral Expansion Stability Analysis (Stantec)
 - Static global
 - Seismic pseudostatic global
- 2016 Bull Run Fossil Inspection Plan
- 2019 Annual Inspection Report (April 26, 2019)
- Bull Run Fossil Informal Inspection Reports

- Annual Instrumentation and Monitoring Program Final Report (Rev. 0), Stantec, September 30, 2019
- Monthly Instrumentation Reports (March 2019--March 2020) by Stantec
- BRF Threshold and Action Level Updates (Rev. 0), Bottom Ash Disposal Area, Gypsum Disposal Area 2A, and Main Ash Pond (AECOM, December 1, 2016)
- BRF Threshold, Action, and Recommendation Level Updates (Rev. 0), Dry Fly Ash Stack (Stantec, December 14, 2016)
- Potential Failure Mode Analysis (May 6, 2016)

The documents were reviewed for previously identified areas of interest, potential locations of structural weakness at each facility, instrumentation condition and readings, and documentation of construction activities that occurred since the previous annual inspection.

General Conditions

The Dry Ash Stack Lateral Expansion was in operation and receiving CCR material at the time of the inspection. Active construction was in progress at the time of the site inspection. A subsurface toe drain is being construction along the south perimeter of the facility.

The Main Ash Pond and Fly Ash Stilling Pond 2C and Sluice Channel ceased receiving CCR material prior to October 19, 2015; therefore, they are inactive CCR Units under the CCR Rule and are subject to the deadlines set forth in 40 CFR 257.100. Active construction was in progress at the time of the inspection. Fly Ash Stilling Pond 2C is being repurposed into a Process Water Basin (PWB1) and is scheduled to be in service by August 2020. The current condition has the conveyance channel routing process water flows to the Main Ash Pond where discharge flows are pumped to the Clinch River and monitored at NPDES Outfall 001. PWB1 has been pumped dry where a liner, sump/pump, principal spillway and emergency spillway are being constructed.

A general overview of site conditions is provided below.

- A good stand of grass is generally maintained on the slopes of the perimeter dikes and stacks of all the facilities.
- Based on a document review, and site observations, there appears to be adequate freeboard at Main Ash Pond (Fly Ash Stilling Pond 2C, and Sluice Channel).
- Operation and maintenance activities at the facilities have been performed since the previous informal and annual inspections.
- No global slope instability was observed during this inspection.
- No evidence of sinkholes and depressions observed.
- Outlet structures and drainage pipes appear to be in good condition.

The inspection team did not observe any deficiencies that would be considered significant. Significant inspection findings are conditions that indicate that the integrity of a significant or high hazard potential water retaining structure (potential loss of life and/or significant property damage) could be in jeopardy if corrective action is not taken. For embankments, significant findings might include, but not limited to, crest settlement, sloughing or wet areas in the downstream slope, increase in the volume of seepage or seepage containing soils, or adverse changes in piezometric levels.

Areas of Interest - 2019 Annual Inspection (March 25, 2019)

No areas of interest related to dam safety structural deficiencies for impoundments or embankments were reported in the 2019 inspection.

Areas of Interest - 2020 Annual Inspection (April 8, 2020)

No areas of interest related to dam safety structural deficiencies for impoundments or embankments were observed from the inspection.

Instrumentation

Instrumentation data was reviewed from March 2019, through part of April 2020. This data included automated and manual pressure head readings obtained at the piezometers and deflection measurements in the slope inclinometers. Instrumentation data is analyzed monthly and quarterly by TVA for significant fluctuations in the automated and manual data, respectively; and, an annual evaluation. The maximum recorded instrumentation readings are listed in the tables of the attachments, and instrumentation layouts are provided in Attachment A.

No changes in instrumentation and automation were observed in the reporting period.

CCR Rule Compliance

Based on 40 CFR §257.83 and §257.84 from the published EPA CCR Rule, various metrics are required for each CCR impoundment and landfill facility for the annual inspection in addition to the visual assessment of the CCR units. A table of these metrics is presented in Attachment D.

Bryan Kyker, PE

Attachment A – CCR Unit and Instrumentation Maps

Attachment B – Dry Fly Ash Stack Lateral Expansion

Attachment C – Main Ash Pond (Fly Ash Stilling Pond 2C and Sluice Channel)

Attachment D – CCR Rule Metric Table

Attachment E - Inspection Deficiency List



Bryan Kyker

4/24/2020

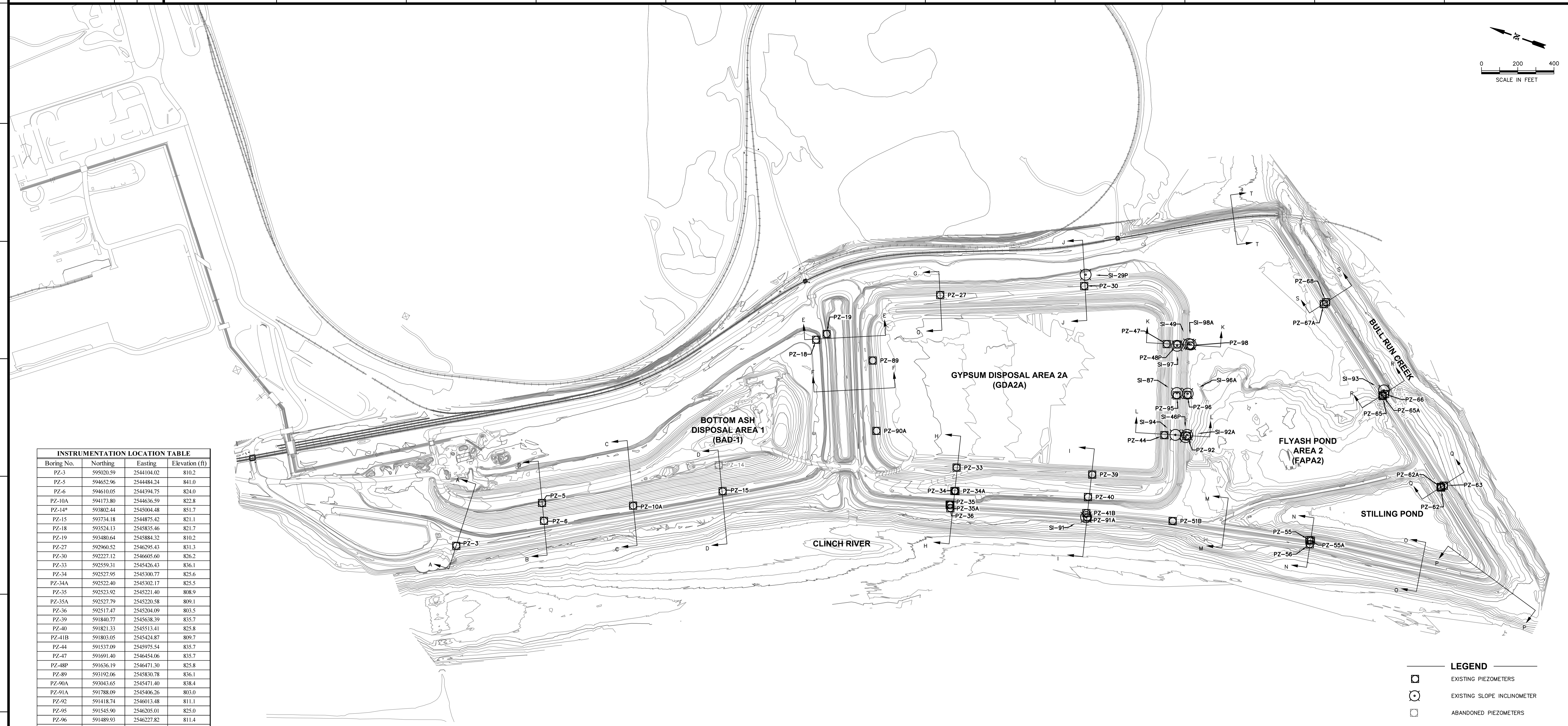
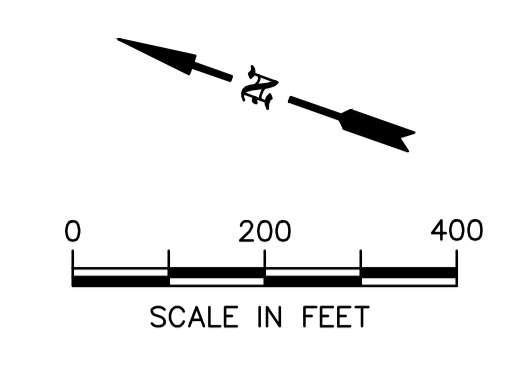
Attachment A

Project Maps

- CCR Unit Map
- Instrumentation Maps



BRF - CCR Unit Map
(NTS)



INSTRUMENTATION LOCATION TABLE

Boring No.	Northing	Easting	Elevation (ft)
PZ-3	595020.59	2544104.02	810.2
PZ-5	594652.96	2544484.24	841.0
PZ-6	594610.05	2544394.75	824.0
PZ-10A	594173.80	2544636.59	822.8
PZ-14*	593802.44	2545004.48	851.7
PZ-15	593734.18	2544875.42	821.1
PZ-18	593524.13	2545835.46	821.7
PZ-19	593480.64	2545884.32	810.2
PZ-27	592960.52	2546295.43	831.3
PZ-30	592227.12	2546605.60	826.2
PZ-33	592559.31	2545426.43	836.1
PZ-34	592527.95	2545300.77	825.6
PZ-34A	592522.40	2545302.17	825.5
PZ-35	592523.92	2545221.40	808.9
PZ-35A	592527.79	2545320.58	809.1
PZ-36	592517.47	2545204.09	803.5
PZ-39	591840.77	2545638.39	835.7
PZ-40	591821.33	2545513.41	825.8
PZ-41B	591803.05	2545424.87	809.7
PZ-44	591537.09	2545975.54	835.7
PZ-47	591691.40	2546454.06	835.7
PZ-48P	591636.19	2546471.30	825.8
PZ-89	593192.06	2545830.78	836.1
PZ-90A	593043.65	2545471.40	838.4
PZ-91A	591788.09	2545406.26	803.0
PZ-92	591418.74	2546013.48	811.1
PZ-95	591545.90	2546205.01	825.0
PZ-96	591489.93	2546227.82	811.4
PZ-98	591564.41	2546489.92	811.3
SI-29P	592240.40	2546666.88	816.8
SI-87	591549.15	2546217.62	824.8
SI-91	591794.45	2545405.16	799.2
SI-92A	591419.12	2546018.28	811.1
SI-94	591480.10	2545996.84	825.8
SI-96A	591491.69	2546234.27	811.4
SI-97	591634.61	2546464.16	825.9
SI-98A	591565.98	2546495.10	811.3
PZ-51B	591336.60	2545543.56	809.8
PZ-55	590589.87	2545693.73	810.1
PZ-55A	590581.12	2545694.58	810.3
PZ-56	590580.44	2545673.06	800.2
PZ-62	590006.07	2546208.94	809.4
PZ-62A	590004.50	2546211.20	809.6
PZ-63	589989.70	2546223.76	801.2
PZ-65	590472.00	2546579.19	809.1
PZ-65A	590474.38	2546581.37	809.1
PZ-66	590462.23	2546593.73	802.3
PZ-67A	590946.92	2546949.33	809.5
PZ-68	590938.03	2546963.83	803.7
SI-93	590476.18	2546610.00	799.8

* INSTRUMENT ABANDONED

LEGEND

- EXISTING PIEZOMETERS
- EXISTING SLOPE INCLINOMETER
- ABANDONED PIEZOMETERS

R #										
R #										
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVID	APPD	ISSD	PROJECT	AS CONST
SCALE: NONE EXCEPT AS NOTED										
ACTIVE INSTRUMENTATION LOCATION PLAN										
BAD-1, GDA2A, AND FAPA2										
DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:				
BULL RUN TENNESSEE VALLEY AUTHORITY FOSSIL AND HYDRO ENGINEERING										
AUTOCAD	2013	DATE	12/15/15	49	C	R #				



P:\Jobs4\Projects\TVA\Instrumentation\FY 15 (60444505)\7.0 ACAD Drawings\BRF\Active Instrumentation 03132012\Active Instrumentation 12152015.dwg User:Kati_Mimore Dec 15, 2015 12:12pm

Attachment B

Dry Fly Ash Stack Lateral Expansion

- Inspection Checklist
- Site Layout



BULL RUN FOSSIL PLANT 2020 INTERMEDIATE INSPECTION

1. Site Name: **Bull Run Fossil Plant** 2. Facility Name: **Dry Fly Ash Stack Lateral Expansion** 3. Date: **04/8/2020**
 4. Operator Name: **Trans Ash** 5. Hazard Classification: **N/A**
 6. Inspector's Names: **Jodie Birdwell, George Keil, Patrick Kiser, Bryan Kyker and Scott Turbow**
 7. Weather Conditions / Temperature: **Fair Conditions and approximately 50 degrees**

Check the appropriate box below. If not applicable, record "N/A". Provide comments when appropriate. Any other areas that should be investigated more closely should also be noted in the "Comments" section. Indicate the locations of any areas identified, and photograph and attach to the form. Previous observation forms should be reviewed and any NEW observations or degradation of previous conditions should be reported on this observation form.

	Yes	No		Yes	No
8. Pre-Job Safety Briefing Performed	X		14. DIKE TOE AREAS		
9. Activity / Construction on / at facility	X		A. Wet Areas of Interest <input type="radio"/> New <input type="radio"/> Existing		X
10. DIKE CREST			<input type="radio"/> Clear or Muddy		N/A
A. Settlement / Cracking		X	<input type="radio"/> Flow Increase / Decrease		N/A
B. Rutting		X	<input type="radio"/> Aquatic Vegetation Growing		X
C. Lateral Displacement		X	<input type="radio"/> Ash or Clay Deposits Below Seep Outlet		X
D. Erosion		X	B. Boils <input type="radio"/> New <input type="radio"/> Existing		X
11. IMPOUNDMENT			<input type="radio"/> Clear or Muddy		N/A
A. Minimum Freeboard Required		N/A	<input type="radio"/> Flow Increase / Decrease		N/A
B. Actual Minimum Freeboard		N/A	<input type="radio"/> Growing in Size		N/A
C. Pool Elevation Measurement		N/A	C. Sinkholes/Depressions <input type="radio"/> New <input type="radio"/> Existing		X
12. DIKE INTERIOR/EXTERIOR SLOPES			15. WATER COLLECTION SYSTEM		
A. Instabilities (Sloughs or Slides)		X	A. Estimated Flow Measurement		N/A
B. Erosion		X	B. Increased Flow		N/A
C. Sinkholes/Depressions <input type="radio"/> New <input type="radio"/> Existing		X	C. Emitting Clear or Dirty Water		N/A
D. Vegetation / Brush / Trees (excessive)		X	16. SPILLWAY WEIRS & OUTLETS		
E. Animal Burrows <input type="radio"/> New <input type="radio"/> Existing		X	A. Decant Riser Misaligned		N/A
F. Wet Areas of Interest <input type="radio"/> New <input type="radio"/> Existing		X	B. Decant Pipe Joints Leaking/Separated		N/A
<input type="radio"/> Clear or Muddy		N/A	C. Headwall in Good Condition		N/A
<input type="radio"/> Increased Flow		N/A	D. Siphons/Emergency Spillway in Good Condition		N/A
<input type="radio"/> Ash or Clay Deposits Below Seep Outlet		X	E. Spillway Outlet in Good Condition		N/A
G. Seep around Drain Pipe (s)		X	17. OPERATIONS & MAINTENANCE		
13. DEFICIENCIES			A. Routine O&M Performed	X	
A. Prior Deficiencies Checked		X	B. Changes in Operations		X
B. New Deficiencies Identified / Flagged		X	18. INSTRUMENTATION		
C. Immediate Actions Taken (Note Below)		N/A	A. Instrumentation readings reviewed		X
D. Photos of deficiencies attached		N/A	B. Instrumentation functioning properly		N/A
			C. Physical Damage to Instrumentation		N/A

19. Major adverse changes in these items could cause instability and should be investigated more closely as soon as possible for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, etc.) in the space below. General inspection comments and observations should also be noted below.

9. Active construction to construct a internal drainage feature (South Toe Drain).

10D & 12B. No significant erosion.

18. No instrumentation.

21. I hereby attest the above is based on actual field observations made during the period indicated, by either myself or an appointed representative and are accurate,

Period Covered:

From: 3/2019 To: 4/2020

Signature: _____

Date: _____

2020 BRF Annual Inspection - Dry Fly Ash Stack Lateral Expansion



Dry Fly Ash Lateral Expansion

Attachment C

Main Ash Pond and Fly Ash Stilling Pond 2C and Sluice Channel

- Inspection Checklist
- Site Layout
- Instrumentation



BULL RUN FOSSIL PLANT 2020 INTERMEDIATE INSPECTION

1. Site Name: **Bull Run Fossil Plant** 2. Facility Name: **Main Ash Pond (FAS Pond 2C & Sluice Channel)** 3. Date: **04/8/2020**
 4. Operator Name: **Trans Ash** 5. Hazard Classification: **Significant**
 6. Inspector's Names: **Jodie Birdwell, George Keil, Patrick Kiser, Bryan Kyker and Scott Turbow**
 7. Weather Conditions / Temperature: **Fair Conditions and approximately 50 degrees**

Check the appropriate box below. If not applicable, record "N/A". Provide comments when appropriate. Any other areas that should be investigated more closely should also be noted in the "Comments" section. Indicate the locations of any areas identified, and photograph and attach to the form. Previous observation forms should be reviewed and any NEW observations or degradation of previous conditions should be reported on this observation form.

	Yes	No		Yes	No
8. Pre-Job Safety Briefing Performed	X		14. DIKE TOE AREAS		
9. Activity / Construction on / at facility	X		A. Wet Areas of Interest <input type="radio"/> New <input type="radio"/> Existing		X
10. DIKE CREST			<input type="radio"/> Clear or Muddy		N/A
A. Settlement / Cracking		X	<input type="radio"/> Flow Increase / Decrease		N/A
B. Rutting		X	<input type="radio"/> Aquatic Vegetation Growing		X
C. Lateral Displacement		X	<input type="radio"/> Ash or Clay Deposits Below Seep Outlet		X
D. Erosion		X	B. Boils <input type="radio"/> New <input type="radio"/> Existing		X
11. IMPOUNDMENT			<input type="radio"/> Clear or Muddy		N/A
A. Minimum Freeboard Required		5 ft	<input type="radio"/> Flow Increase / Decrease		N/A
B. Actual Minimum Freeboard		>5 ft	<input type="radio"/> Growing in Size		N/A
C. Pool Elevation Measurement		Unknown	C. Sinkholes/Depressions <input type="radio"/> New <input type="radio"/> Existing		X
12. DIKE INTERIOR/EXTERIOR SLOPES			15. WATER COLLECTION SYSTEM		
A. Instabilities (Sloughs or Slides)		X	A. Estimated Flow Measurement		N/A
B. Erosion		X	B. Increased Flow		N/A
C. Sinkholes/Depressions <input type="radio"/> New <input type="radio"/> Existing		X	C. Emitting Clear or Dirty Water		N/A
D. Vegetation / Brush / Trees (excessive)		X	16. SPILLWAY WEIRS & OUTLETS		
E. Animal Burrows <input type="radio"/> New <input type="radio"/> Existing		X	A. Decant Riser Misaligned		N/A
F. Wet Areas of Interest <input type="radio"/> New <input type="radio"/> Existing		X	B. Decant Pipe Joints Leaking/Separated		N/A
<input type="radio"/> Clear or Muddy		N/A	C. Headwall in Good Condition		N/A
<input type="radio"/> Increased Flow		N/A	D. Siphons/Emergency Spillway in Good Condition		N/A
<input type="radio"/> Ash or Clay Deposits Below Seep Outlet		N/A	E. Spillway Outlet in Good Condition		N/A
G. Seep around Drain Pipe (s)		X	17. OPERATIONS & MAINTENANCE		
13. DEFICIENCIES			A. Routine O&M Performed	X	
A. Prior Deficiencies Checked		X	B. Changes in Operations		X
B. New Deficiencies Identified / Flagged		X	18. INSTRUMENTATION		
C. Immediate Actions Taken (Note Below)		N/A	A. Instrumentation readings reviewed	X	
D. Photos of deficiencies attached		N/A	B. Instrumentation functioning properly	X	
			C. Physical Damage to Instrumentation		X

19. Major adverse changes in these items could cause instability and should be investigated more closely as soon as possible for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, etc.) in the space below. General inspection comments and observations should also be noted below.

9 - Construction in progress at Main Ash Pond. Stilling Pond 2C is being repurposed into Process Water Basin 1. Construction is approximately 80% completed.

11A&B - By observation it appears there is greater than 5' of FB. Process water flows are conveyed to the Main Ash Pond and overflows pumped to the Clinch River which construction is in process at PWB1.

11C - Staff gauge not in service while construction is in progress.

16A-E - Principal and Emergency spillways nearing the end of construction at PWB1.

21. I hereby attest the above is based on actual field observations made during the period indicated, by either myself or an appointed representative and are accurate,

Period Covered:

From: 3/2019 To: 4/2020

Signature: _____

Date: _____

2020 BRF Annual Inspection - Main Ash Pond (Stilling Pond 2C, and Sluice Channel)



BRF Instrumentation Data			
Main Ash Pond			
Instrument	Instrument Type	Maximum Water Elevation Since Previous Inspection (ft)	Date Maximum Water Elevation Recorded
BRF_PZ51B	Piezometer	803.6	2/6/2020
BRF_PZ65	Piezometer	799.4	2/6/2020
BRF_PZ65A	Piezometer	801.3	2/6/2020
BRF_PZ66	Piezometer	799	2/6/2020
BRF_PZ67A	Piezometer	802.7	3/26/2020
BRF_PZ68	Piezometer	799	2/6/2020
BRF_S_2D_PZ1	Piezometer	779.2	12/16/2019
BRF_S_2D_PZ2	Piezometer	792.9	12/16/2019
BRF_S_2D_PZ3	Piezometer	802.4	12/16/2019
BRF_S_2D_PZ4	Piezometer	813.6	12/16/2019

BRF Instrumentation Data
Facility: Fly Ash Pond Area 2

Instrument	Instrument Type	Maximum Water Elevation Since Previous Inspection (ft)	Date Maximum Water Elevation Recorded
BRF_PZ55	Piezometer	794.4	2/6/2020
BRF_PZ55A	Piezometer	793.5	2/6/2020
BRF_PZ56	Piezometer	799.5	4/20/2019
BRF_PZ62	Piezometer	788.6	12/16/2019
BRF_PZ62A	Piezometer	793.3	3/25/2020
BRF_PZ63	Piezometer	Dry	

Attachment D

CCR Rule Requirements Table

- Dry Fly Ash Stack Lateral Expansion
- Main Ash Pond (Fly Ash Stilling Pond 2C, and Sluice Channel)

**Bull Run Fossil Plant 2020 Annual (Intermediate) Inspection
 CCR Rule Section §257.84 - Inspection Requirements for CCR Landfills**

	Dry Fly Ash Stack Lateral Expansion
Any changes in geometry of the structure since the previous annual inspection	No
The approximate volume of CCR contained in the unit at the time of the inspection (CY)	657,000
Appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit	None observed, See Attachment B
Any other changes which may have affected the stability or operation of the CCR unit since the previous annual inspection	None observed, See Attachment B

**Bull Run Fossil Plant 2020 Annual (Intermediate) Inspection
CCR Rule Section §257.83 - Inspection Requirements for CCR Surface Impoundments
Main Ash Pond (Fly Ash Stilling Pond 2C and, Sluice Channel)**

	Sluice Channel ³	Fly Ash Pond 2C ³	Stilling Pond (PWB1) ³
Any changes in geometry of the impounding structure since the previous annual inspection	No	No	Yes ⁴
Location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection	See Attachment A and C		
Approximate minimum depth (elevation) of the impounded water since the previous annual inspection ¹	N/A ⁶	0.0 ft (max ash elev. = 807 ft, min pool elev. = 799.9 ft)	N/A ⁵
Approximate maximum depth (elevation) of the impounded water since the previous annual inspection ¹	N/A ⁶	31 ft (min ash elev. = 770 ft, max pool elev. = 801 ft)	N/A ⁵
Approximate present depth (elevation) of the impounded water ¹	N/A ⁶	31 ft (min ash elev. = 770 ft, max pool elev. = 801 ft)	N/A ⁵
Approximate minimum depth (elevation) of the CCR material since the previous annual inspection ¹	0 ft (782 - 782 ft)	0 ft (770 - 770 ft)	N/A ⁵
Approximate maximum depth (elevation) of the CCR material since the previous annual inspection ¹	28 ft (810 - 782 ft)	37 ft (807 - 770 ft)	N/A ⁵
Approximate present depth (elevation) of the CCR material ¹	0 ft (782 ft) - Min, 28 ft (810 ft) - Max	0 ft (770 ft) - Min, 37 ft (807 ft) - Max	N/A ⁵
Storage capacity of the impounding structure at the time of the inspection ²	N/A ⁶	225,054 CY	N/A ⁵
Approximate volume of impounded water at the time of the inspection ²	N/A ⁶	76549 CY	N/A ⁵
Approximate volume of CCR material at the time of the inspection ¹	1,432,000 CY ⁷		N/A ⁵
Appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit	None observed, See Report and Attachment C	None observed, See Report and Attachment C	None observed, See Report and Attachment C
Any other changes which may have affected the stability or operation of the impounding structure since the previous annual inspection	None observed, See Report and Attachment C	None observed, See Report and Attachment C	None observed, See Report and Attachment C

¹Based lowest elevation utilized in TriAD volume calculation conducted April 2017. Updated March 2020 with Stantec geotech borings.

²Based on the lowest top of dike elevation from 2016 TVA survey.

³Inactive Unit

⁴Stilling Pond being repurposed into Process Water Basin (PWB1). CCR material has been removed.

⁵Stilling Pond 2C (PWB1) has been pumped dry while construction is in process. PWB1 will go into service around end of June 2020.

⁶Shallow conveyance channel with liner system has been constructed on top of the Sluice Channel and conveys process water flows to the Main Ash Pond until PWB1 construction is completed.

⁷Approximate volume was adjusted due to recently obtained updated data (borings). In place CCR volumes recalculated.

Attachment E

2020 Annual Inspection Item (Deficiency) List

NO ITEMS REPORTED