



## TVA Disposal Facility Assessment Phase 1 Plant Summary Bull Run Fossil Plant (BRF)

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Location:	Bull Run Fossil Plant (BRF) 1265 Edgemoor Road Clinton, Anderson County, TN 37716		
	Latitude: 36.006 N	Longitude:	84.157 W
Plant Contact:	Jamey Dotson Program Manager Phone: 423-290-7269      Email: vjdotson@tva.gov		
Facts and Figures:	The Bull Run Fossil Plant has a single coal-fired generating unit and generates six billion kilowatt-hours of electricity each year. Construction began in 1962 and was completed in 1966. The plant consumes approximately 7,300 tons of coal per day. It is located on Melton Reservoir on the Clinch River, in Clinton, Tennessee.		
Coal Combustion Byproduct Disposal:	Approximately 240,000 tons of dry fly ash is collected in a silo each year and hauled to an onsite permitted dry stack disposal area (Dry Fly Ash Disposal Area). Approximately 25,000 tons per year of bottom ash is wet-sluciced to the main fly ash pond (Area 2). Approximately 240,000 dry tons of scrubber gypsum will be produced each year and will be wet sluciced to the permitted gypsum stacking area (Gypsum Disposal Area 2A). Approximately 50,000 tons of the scrubber gypsum will be marketed offsite to the cement industry.		
Geology and Seismicity:	The Bull Run Fossil Plant is located in east-central Tennessee along the east shore of the Clinch River, just north (upstream) of the confluence of the river and Bull Run Creek. As such, the portions of the plant along the river and adjacent to Bull Run Creek, including the ash disposal areas, are underlain by alluvium consisting of silts and clays with varying amounts of sand. The remaining portions of the plant are primarily underlain by residual soils resulting from the in-place weathering of the parent Ordovician and Cambrian age limestone and calcareous shale bedrock formations. The topography and geology within the vicinity of the plant are typical of the Valley and Ridge Physiographic Province, characterized by parallel ridges trending northeast to southwest and underlain by more erosion resistant		



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siltstones, sandstones, and dolomites, and valleys underlain by the less erosion resistant shales and limestones. The area has been subjected to several organic events that have caused folding, fracturing and faulting of the bedrock throughout the region. A succession of thrust faults within the area has resulted in several bedrock units being present beneath the plant footprint. The plant straddles Bull Run Ridge, which is underlain by the Rome Formation consisting of arenaceous shale and sandstone beds. The valley south of Bull Run Ridge is underlain by the interbedded argillaceous shales and siltstones of the Conasauga Group while the valley north of the ridge is underlain by several sub-units of the Chickamauga Formation consisting of limestone, shaley limestone, calcareous shale, and calcareous siltstones. The Chickamauga formation dips about 40° to the southeast, is moderately to highly jointed and faulted, and is moderately solutioned along the joints and bedding planes. These solution features produce near vertical “slots” filled with soft clay which can extend to significant depths.

Seismic events affecting eastern Tennessee, and thus the plant site, primarily emanate from three zones of earthquake activity – the New Madrid Seismic Zone (NMSZ), Southern Appalachia Seismic Zone (SASZ), and the South Carolina Seismic Zone (SCSZ). The most active zone of the SASZ, the East Tennessee Seismic Zone (ETSZ), extends from northwestern Georgia through east Tennessee and is situated in close proximity to the plant. However, most earthquakes emanating from this zone are relatively low in magnitude, with the largest known event in the ETSZ registering a magnitude of 4.6, suggesting a moderate risk of damage from a seismic event. In contrast, if a large earthquake were to occur within the New Madrid zone to the west, damage to East Tennessee would be possible. The “Geologic Hazards Map of Tennessee – Environmental Geology Series No. 5” developed and published by the Tennessee Department of Environment and Conservation (TDEC), Division of Geology and compiled by Robert Miller (1978) shows the plant to be located in Seismic Risk Zone 2.



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Facilities Reviewed:

- Bottom Ash Disposal Area 1
- Gypsum Disposal Area 2A
- Fly Ash Pond/Stilling Pond Area 2
- East/West Dredge Cell
- Dry Fly Ash Stack
- Dry Fly Ash Stack Sediment Pond



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Bottom Ash Disposal Area 1 (BAD-1)**

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1. General Facility Information

Facility Status: Active

Surface Area:	40 acres	Maximum Height (toe to top of stack):	52 feet (estimated top of stack to river)
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2. Site Visit Information

Stantec Assessment Team: Roger Denick, PE and John Beam, PG

TVA Staff Present: Travis Markum

Field Assessment Dates: January 14, 2009 and February 13, 2009

Weather/Site Conditions: mid 30 degrees F, partly sunny (January 14, 2009); mid 40 degrees F, sunny (February 13, 2009).

3. History/Description of Usage

History, Operation and Stacking Plan:

The Bottom Ash Disposal Area 1 was originally known as just Area 1. Area 1 was part of the original plant layout when the plant went online in 1966. Area 1 was originally a fly ash pond and had a spillway discharging into the Clinch River in the southwest corner. Starting in 1980, a major portion of Area 1 was diked to receive dredged material from Area 2 (fly ash). However, with the East/West Dredge Cell going online in 1981, this area was used as a fly ash settlement pond and discharged into the ash channel. The northwest corner of the Area 1 received sluiced bottom ash and a channel conveyed this to Area 2 (current operations). In 1985, the settlement pond in Area 1 ceased receiving sluiced ash and was filled with bottom ash. Bottom ash was stacked according to the 1986 stacking plan until 1988. From 1988 to 2004, bottom ash was temporarily stacked in this area prior to going to Area 2A for disposal. From 2004 to present bottom ash not sold is stacked in Bottom Ash Disposal Area 1. Currently 25,000 tons of bottom ash is sluiced into the ash channel in the northwest corner of the Bottom Ash Disposal Area 1. Bottom ash that is not sold offsite is stacked in Area 1.



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Stacking over Dredge Cells or CCB Ponds: Yes

Past Failures/Releases: No failures or releases reported.

#### 4. Owner's Operations, Maintenance and Inspection Information

TVA Maintenance: An Operations Manual is present for Bull Run Fossil Plant Area 1 and 2A, Ash and Gypsum Disposal Operations Plan (TVA,2004).

The following items are noted for Maintenance. Mowing and removal of excess vegetation on the ponds and dry stacks are done once per year. The drainage ditches are cleaned out and roads regraded once or twice a year. Other maintenance work is done on an as-needed basis.

TVA Inspections: TVA Engineering performs annual dike inspections and prepares reports. Plant personnel also perform quarterly red water seep inspections.

Problems Previously Identified During Past TVA Inspections: Seepage along west dike (1973 - 1976).  
Seepage along north dike with discoloration (1979).  
Slippage/settlement along south dike (1981).  
Standing water between earth dike and ash stack (1983).  
Standing water in ditch on west side (1994-current).  
Several slides on raised dike (1998).  
Erosion from stack drainage pipe on east side of ash channel (2008).

#### 5. Documents Reviewed

See attached Document Log for complete list of documents provided by TVA for review. In particular, the following provided pertinent information for the assessment of this facility:

TVA Design Drawings: Drawing numbers 10N208, 10N209, 10N213, 10N214, 10N280, 10N281, 10N410 through 10N412, and 10W288.

TVA As-Built Drawings: None available.

TVA Construction Testing Records: None available.

TVA Annual: TVA Annual Inspection Reports 1967-2008.



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Inspection Reports:

Geotechnical Data:               None available.

6.     Stantec Field Observations

See attached Concerns/Photo Log, Photos, and Site Plan Drawing.

6.1.   Exterior Slopes and Benches

Vegetation:	Mostly grass and light brush. Some brush and trees near river bank on south side (Section 5).
Trees:	Some trees near river on west side. Also isolated trees on south side near standing water near access road, below access road along channel between Area 1 and Area 2A (Gypsum Disposal).
Erosion:	None observed.
Instabilities:	Northeast slope excavated to make room for ash piles. Exposed bottom ash with small void between ash/soil interface.
Uniform Appearance	Good.
Benches:	Four benches noted at measured section 2. They were located 23 feet below top of stack (31 feet wide), 33 feet below top of stack (29 feet wide), 36 feet below top of stack (10 feet wide) and 44 feet below top of stack (8 feet wide).
Slope:	3.5H:1V Top of stack to intermediate bench, Section 2 2H:1V and steeper, intermediate bench to river, Section 2.
Height:	Approximately 50 feet (estimated Section 2).
Other:	Two animal burrows were noted in south slope above standing water near access road.  Tire ruts were noticed on the southwest side on the bench above the access road.



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6.2. Perimeter Drainage Ditches and Down-Drains

Vegetation:	Mostly grass, some brush.
Rip-Rap Channel Lining:	None observed.
Erosion:	None observed.
Siltation in Ditches:	Some ash siltation was observed in the drainage ditch on the south side bench above the access road. Also, major ash deposited at confluence of drainage ditch and ash channel on southeast side of stack.
Standing Water in Ditches or on Benches:	Standing water was observed in the drainage ditch along the access road on the west and south side of the stack. Water was stagnant and varied in width between 4 feet on the northwest corner, to exceeding 8 feet in the south east corner. This has been noted in previous inspection reports starting in 1983.
Silted/Impeded Drainage Pipes:	None observed.
Other:	Two animal burrows were noted in south slope above standing water near access road.  Tire ruts were noticed on the southwest corner of the bench above the access road. Standing water was observed in them.

7. Notable Observations and Concerns

- Standing water in the drainage ditch along the road of the west and south side of the Bottom Ash Stack is a concern. This drainage ditch begins upstream of the Chemical Pond and flows into the Ash Channel on the southeast corner of the Bottom Ash Stack. There appears to be very little gradient in this channel and the water is stagnant. This has been noted in past inspection reports as early as 1983. Past inspection reports have recommended cleaning and regrading of this area.
- Reddish discoloration was observed in the standing water on the west side of the Bottom Ash Stack. No movement was observed and it is unclear when or where this standing water originated.



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- A red water seep was noted on the lower southern slope of the Bottom Ash Stack, along the channel between Area 1 and 2A. The seep is located on the slope and just west of the confluence of the drainage channel and the ash channel. The bank was observed as soggy and some standing water was observed for a significant area. Redness was observed in the channel below. Heavy vegetation was present in the area of the seep. This seep has been noted in the previous inspection report (2008).
- Inlet and outlet pipes for the lower channel between Area 1 and 2A were not located during the field assessment.
- Tire ruts are observed with ponding water on the southwest side of the Bottom Ash Stack on the bench above the road.
- Trees are located on south exterior slope, and at a few other isolated locations on the west dike.
- Two animal burrows were observed in the south exterior slope above the standing water in the drainage ditch.
- The Bottom Ash Stack eastern slope has been excavated to make room for stockpiling ash. This is located near the inlets to the Bottom Ash Pond. A void was also observed at the interface between the soil and exposed ash in the slope.
- Slopes 2H:1V and steeper were noted on lower slopes.

## 8. Recommendations

### 8.1. Phase 2 Engineering and Programmatic Recommendations

- The Bottom Ash Disposal Area 1 is built over former ash ponds and dredge cells. A Phase 2 geotechnical exploration should be performed to evaluate stability. This would include a subsurface exploration and slope stability analysis. In addition, a monitoring program should be implemented including installation of piezometers and inclinometers.
- Based on the limited as-built drawings available, it is recommended that a program be established to develop current conditions / as-built drawings to record future modifications to this facility. Construction records should also be included as part of this program to record and quantify construction means, methods and results.
- It is recommended that Bottom Ash Disposal Area 1 undergo further engineering study to evaluate alternatives to alleviate the persistent standing water in the drainage channels. This may include detailed surveying of the discharge ditch and evaluation of alternatives to provide positive drainage.



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- Based on the findings of Phase 2 and designs from Phase 3, if performed, Stantec recommends that the existing O&M Manual be reviewed and updated. These updates may include sections on routine monitoring and facility maintenance.

8.2. Maintenance Recommendations

- Repair tire ruts where noted.
- Repair animal burrows where noted.
- Remove trees from south side of Bottom Ash Stack on upslope from access road.
- Locate and maintain inlet and outlet structures to the lower channel between the Bottom Ash Stack Area 1 and the Gypsum Disposal Area 2A. Area should drain to Clinch River.
- Continue to monitor areas of noted seeps and wet areas on a consistent basis.



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Phase 1 Coal Combustion Product Disposal  
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Gypsum Disposal Area 2A (GDA-2A)**

1. General Facility Information

Facility Status:	Active	NID Identification:	Not known
Surface Area (inside dikes):	35 acres	Maximum Height (toe to top of dike):	45 feet
Free Water Volume:	Unknown	Maximum Water Storage:	Unknown
Estimated CCB Storage:	40,000 tons	Dike Length:	4900 feet (estimated)
Plant Discharge to Facility:	Unknown	Current Pool Elevation:	825 (estimated)

2. Site Visit Information

Stantec Assessment Team: Roger Denick, PE and John Beam, PG

TVA Staff Present: Travis Markum

Field Assessment Dates: January 14, 2009, February 13, 2009 and February 14, 2009.

Weather/Site Conditions: Mid 30 degree F, partly sunny (January 14, 2009); mid 40 degree F, sunny (February 13, 2009 and February 14, 2009). Some moisture from overnight rain on February 14, 2009.

3. History/Description of Usage

History and Operation: Gypsum Disposal Area 2A was originally just called Area 2A. In 1981, a new interior dike was constructed within Area 2 to form Area 2A. Fly ash was sluiced to this area once construction was complete. In 1989, this area was used to dry stack bottom ash from Area 1. In 2004, this area became inactive. Construction began in 2006 to develop Area 2A for gypsum disposal. The Gypsum Disposal Area 2A went online in late 2008. Approximately 240,000 dry tons of scrubber gypsum will be produced each year and will be wet sluiced to the



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Gypsum Disposal Area 2A (GDA-2A)**

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permitted gypsum stacking area (Gypsum Pond Area 2A). It is estimated that approximately 50,000 tons of the scrubber gypsum will be sold.

Past Failures/Releases: No failures or releases reported.

**4. Owner's Operations, Maintenance and Inspection Information**

Emergency Action Plan: No EAP has been prepared for this facility.

Operations Manual: Yes, Bull Run Fossil Plant - Area 1 and 2A Ash and Gypsum Disposal Operations Plan (TVA, 2004).

TVA Maintenance: Mowing and removal of excess vegetation on the ponds and dry stacks are done once per year. The drainage ditches are cleaned out and roads regraded once or twice a year. Other maintenance work is done on an as-needed basis.

TVA Inspections: TVA Engineering performs annual dike inspections and prepares reports. Plant personnel also perform quarterly red water seep inspections.

Problems Previously Identified During Past TVA Inspections: Erosion gullies on lower south slope (2008). Bank slides on east side along ash channel (2009).

**5. Documents Reviewed**

See attached Document Log for complete list of documents provided by TVA for review. In particular, the following provided pertinent information for the assessment of this facility:

TVA Design Drawings: Drawing numbers 10W294 (Rev 0 and 1), 10W294-12, 10W297-1 through 10W297-40, 10W298-1 through 10W298-42.

TVA As-Built Drawings: None available.

TVA Construction Testing Records: None available.

TVA Annual Inspection Reports: TVA Annual Inspection Reports from 1967 to 2008.



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Gypsum Disposal Area 2A (GDA-2A)**

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Geotechnical Data: No boring information found but the Operation Manual (TVA, 2004) includes a stability analysis in Appendix G.

## 6. Stantec Field Observations

See attached Concerns/Photo Log, Photos, and Site Plan Drawing.

### 6.1. Interior Slopes

Vegetation: None observed, bare ash and clay.

Trees: None observed.

Wave Wash Protection: None observed.

Erosion: Numerous erosion gullies along interior slope in ash. None were large enough to compromise stability at this time.

Instabilities: Minor sloughing in corners.

Animal Burrows: None observed.

Freeboard: **Measured:** Varies. 6 feet (Section 5)  
11 feet (Sections 6,7 and 8)  
**Design:** Varies, pond/stacking plan

Encroachments: None were observed.

Slope: **Measured:** 3.5H:1V on all sides  
**Design:** 3H:1V (10W297-33)

### 6.2. Crest

Crest Cover and Slope: Clay soil, no vegetation.

Erosion: None observed.

Alignment: Good.

Settlement/Cracking: None observed.

Bare Spots/Rutting: Minor tire ruts were observed along length of crest.

Width: **Measured:** 30 feet (Section 5)



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Gypsum Disposal Area 2A (GDA-2A)**

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**Design:** 10 feet (Section 6, 7 and 8)  
15 feet (10W297-32)

### 6.3. Exterior Slopes

**Vegetation:** Sparse grass and brush on all but north side. North side has adequate grass on slopes. Trees and brush on slope to lower channel between Area 1 and 2A. West side had adequate grass on lower slopes.

**Trees:** None except in lower slope on north end near drainage channel between area 1 and 2A and along river on west side.

**Erosion:** Two erosion gullies noted on south lower slope. Some erosion seen along banks of ash channel on east side. (see observations)

**Instabilities:** Two depressions located on south lower slope. One of which is large (approximately 9 foot diameter) and located in line with outlet pipe from gypsum pond.

**Uniform Appearance:** Additional vegetation is needed to maintain a uniform slope.

**Seepage:** Wet areas were observed on the east portion of the lower south slope toe along ash pond.

**Benches:** Section 5 - three benches (28 feet wide (below crest), 12 feet wide, and 18 feet wide (access road).  
Section 6 - one bench (access road) 25 feet wide  
Section 7 - one bench (access road) 28 feet wide  
Section 8 - three benches (83 feet wide (below crest), 56 feet wide (access road, standing water) and 10 feet wide (above river bank).

**Foundations, Drains, Relief Wells, Instrumentation:** Internal drainage network for dewatering pond/stack. Lateral outlet pipes on east and west end at 250 feet c.c. (located). Some pipes on east end were silted or had separated joints (see observations). Lateral outlet pipes on south side were not located according to drawings and were silted or missing.

**Animal Burrows:** None observed.



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**Gypsum Disposal Area 2A (GDA-2A)**

Slope:	<b>Measured:</b> 3.5H:1V (top of dam to road, Section 6, 7, and 8) 2.6H:1V (top of dam to road, Section 5)
	<b>Design:</b> 3H:1V top of dam to access road (10W297-26) 2H:1V access road to river ( 10W297-26)
Height:	<b>Measured:</b> 34 feet (ash channel to crest, section 6) 29 feet (ash pond to crest, section 7) 48 feet (river to crest, section 8)
	<b>Design:</b> 45 feet (10W297)

6.4. Spillway Weirs/Riser Inlets

Number:	Two (2) - located in south portion of gypsum pond.
Size, Type and Material:	30 inch bituminous coated corrugated metal standpipe.
Height of Riser Inlets:	Unable to measure.
Access:	No access.
Joints:	Unable to observe.
Mis-Alignment:	None observed.
Closed/Abandoned Conduits:	None observed.

6.5. Outlet Pipes

Number:	Two (2) - discharging into Active Ash Pond Area 2.
Size, Type and Material:	24 inch PE pipe encased by 30 inch CMP with concrete sleeve.
Headwall:	None observed.
Joint Separations:	None observed.
Mis-Alignment:	None observed.
Closed/Abandoned Conduits:	None observed.



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Gypsum Disposal Area 2A (GDA-2A)**

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7. Notable Observations and Concerns

- Area 2A was previously a dredged ash cell before being converted recently to a Gypsum Pond (sluicing operations began December 2008). According to drawings, the pond is constructed on top of dredged fly ash with a compacted bottom ash drainage layer, with the embankments constructed out of fly ash with a clay cover. Ultimately, the Gypsum Pond will be a Gypsum Stack with height exceeding 100 feet (drawings 10W297 and 10W298 and 2004 Operations Manual). An elaborate underdrain system exists in the gypsum pond to collect internal drainage. However, slope instabilities are being observed on the east bank along the ash channel and on the south side on the slope to the ash pond. Construction of embankments and stacking over hydraulically placed ash is a potential slope stability issue and requires engineering analysis and geotechnical exploration.
- Several depressions were noted on the lower south slope into the ash pond. One of these depressions is large in size (approx. 8.5 feet by 13 feet by 1 foot deep) and appears to be in line with the western most discharge pipe from the gypsum pond.
- Two erosion areas were noted on lower south slope to ash pond. First area is next to west most rip rap channel measuring 5 feet wide, 2 feet deep starting at top of slope at access road and continuing down slope. Worst portion is within 20 feet of access road. Second erosion area is located 15 feet west of east most rip rap channel measuring 2 feet wide by 6 inches deep by 6 feet long (down the slope).
- Several lateral outlet drainage pipes on the east side, discharging to the ash channel, are not maintained. The southern most pipe is not long enough to reach the ash channel and is 1/2 filled with silt. Third pipe north of most southern pipe has separated joint at outlet.
- Several lateral outlet drainage pipes on the south side along the access road are missing and not maintained. Plans indicate that the lateral outlet pipes are to be spaced 120 feet on center on the south side. The lateral pipes were not located east of the western most rock channel on the downslope. The located lateral outlet pipes had separated joints, were 1/3 to 1/2 silted up, and had ponding water below them. In addition, several lateral outlet pipes at toe of lower southern slope discharging into the ash pond are silted or clogged.
- Wetness was observed at the toe of the vegetated mat on the south slope into the ash pond. The wet areas extended 6 to 10 feet upslope and were mainly noticed on the eastern third of the slope.
- Vegetative cover is sparse along slopes of gypsum pond.



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Gypsum Disposal Area 2A (GDA-2A)**

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- Interior slopes of pond have numerous erosion gullies and exposed ash slopes.
- Standing water is observed on the north side of the gypsum pond along the access road. This drainage channel is supposed to drain to the ash channel.
- Standing water was observed at the toe of the slope and the road on the west slope. This area drains to the stilling pond but has been overgrown with vegetation. The main area of standing water is along the southwest portion of the dike and the water extends from the road to the toe.
- Access road along the north side of gypsum pond is a dirt road. Three separate areas of wheel ruts with ponding water was observed along the road.
- Wheel ruts are observed on the crest of the pond. These ruts are shallow and not holding water but the crest is comprised of clay soil and should not be driven on.

## 8. Recommendations

### 8.1. Phase 2 Engineering and Programmatic Recommendations

- It is recommended that Gypsum Disposal Area 2A undergo further engineering study to evaluate the cause of the depressions and erosion on the south side and slope stability to evaluate the proposed stacking configuration.
- Due to the Gypsum Disposal Area 2A being constructed over former dredge ponds and the ultimate stacking exceeding 100 feet, it is recommended that the Gypsum Disposal Area 2A undergo a geotechnical exploration to evaluate the stability and feasibility of the area to adequately handle the future configuration. It is also recommended to install a monitoring program for this facility including the installation of piezometers and inclinometers. Based on the results, further evaluation and analysis could be needed.
- The drainage channels on the north and west side need to be maintained and evaluated to provide positive drainage and reduce the standing water. If adequate information is not available for regrading, a detailed survey should be done to determine the gradient and slope.
- Based on the findings of Phase 2 and designs from Phase 3, if performed, Stantec recommends that the existing O&M Manual be reviewed and updated. These updates may include sections on routine monitoring and facility maintenance.



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Gypsum Disposal Area 2A (GDA-2A)**

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8.2. Maintenance Recommendations

- Repair tire ruts where noted and encourage TVA employees to only drive on areas that have gravel roads or better.
- Repair animal burrows where noted.
- Repair erosion and sloughed areas where noted on interior slopes of ponds. Line interior pond slopes with rip-rap to help reduce future erosion.
- Clean siltation and repair separated joints from lateral drainage pipes on south and east side of Gypsum Disposal Area 2A.
- Repair tire ruts on access road on north side of Gypsum Disposal Area and replace dirt road with gravel consistent with access road on south side of Bottom Ash Stack.
- Remove excess vegetation, brush and deposited ash that has accumulated in runoff drainage channels along the north side of the Gypsum Disposal Area 2A. Regrade the channel to drain to the ash channel in the northeast corner.
- Continue to monitor areas of noted seeps and wet areas on a consistent basis.
- Establish more vegetative cover along the exterior slopes of the Gypsum Disposal Area 2A. This may include placement of vegetative mats and reseeded to provide vegetation.



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Phase 1 Coal Combustion Product Disposal  
Facility Summary  
Bull Run Fossil Plant (BRF)  
Fly Ash Pond Area 2 (FAP2)**

1. General Facility Information

Facility Status:	Active	NID Identification:	Not known
Surface Area (inside dikes):	41 acres	Maximum Height (toe to top of dike):	18 feet (crest to river, section 13)
Free Water Volume:	Unknown	Maximum Water Storage:	Unknown
Estimated CCB Storage:	4,320,000 tons	Dike Length:	4700 feet (estimated three sides)
Plant Discharge to Facility:	22.3 MGD	Current Pool Elevation:	806.5 feet

2. Site Visit Information

Stantec Assessment Team:	Roger Denick, PE and John Beam, PG
TVA Staff Present:	Travis Markum
Field Assessment Dates:	January 14, 2009 and February 14, 2009
Weather/Site Conditions:	mid 30 degrees F, partly sunny (January 14, 2009); low to mid 50 degrees F, sunny (February 14, 2009). Some moisture from overnight rain on February 14, 2009.

3. History/Description of Usage

History and Operation: The Fly Ash Pond Area 2 was one of the original facilities constructed when the plant went online in 1966-1967. No ash was sluiced to the pond until 1971 when a channel was constructed that linked Area 1 (current Bottom Ash Disposal Area 1) to the current Fly Ash Pond Area 2. The original spillway was located in the south end of the pond and discharged into Bull Run Creek. In 1976, an internal dike was constructed to form the stilling pond in the west portion of the pond. With the construction of the stilling pond was three concrete riser spillway structures which discharge into Melton Hill Reservoir (Clinch River). Water would enter the stilling pond through a rock weir in the middle of the internal dike. The spillway in the south portion of the pond was abandoned. In 1981, a portion of



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Fly Ash Pond Area 2 (FAP2)**

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Area 2 was diked off to form what is now Area 2A (Gypsum Disposal Area). This area in 1981 was used as a secondary fly ash settlement pond. Currently, the pond receives sluiced fly ash (and some bottom ash) from the ash channel which originates on the east side of the Bottom Ash Disposal Area 1. The pond also receives discharges from the Gypsum Disposal Area 2A, Coal Yard Runoff Pond and Chemical Treatment Pond. Approximately 25,000 tons per year of bottom ash is wet sluiced to the ash channel in the Bottom Ash Disposal Area. Some fly ash is also sluiced but the quantity is unknown. It is also unknown the exact amount of bottom ash that does not settle out prior to the ash channel reaching Fly Ash Pond Area 2.

Past Failures/Releases: No failures or releases reported.

4. Owner's Operations, Maintenance and Inspection Information

Emergency Action Plan: No EAP has been prepared for this facility.

Operations Manual: An Operations Manual is present for Bull Run Fossil Plant Area 1 and 2A, Ash and Gypsum Disposal Operations Plan (TVA,2004).

TVA Maintenance: Mowing and removal of excess vegetation on the ponds and dry stacks are done once per year. The drainage ditches are cleaned out and roads regraded once or twice a year. Other maintenance work is done on an as-needed basis.

TVA Inspections: TVA Engineering performs annual dike inspections and prepares reports. Plant personnel also perform quarterly red water seep inspections.

Problems Previously Identified During Past TVA Inspections: Seepage along west dike (1976-1979).  
Standing water along toe ditch (1993 - 1995).  
Erosion on inside dike of stilling pond (1993-2000).  
Wet, soft area on toe of south dike (1995).  
Water discharging out of abandoned concrete pipe in south side, debris in pipe (1995).  
Cracks in outlet pipes in joints (1996-2005).  
Bank erosion along Bull Creek Run (south side) (2007-2009).



**TVA Disposal Facility Assessment  
Phase 1 Coal Combustion Product Disposal  
Facility Summary  
Bull Run Fossil Plant (BRF)  
Fly Ash Pond Area 2 (FAP2)**

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5. Documents Reviewed

See attached Document Log for complete list of documents provided by TVA for review. In particular, the following provided pertinent information for the assessment of this facility:

TVA Design Drawings:	Drawing numbers 10E285, 10N213, 10N214, 10N280 through 10N284, 10N292.
TVA As-Built Drawings:	None available.
TVA Construction Testing Records:	None available.
TVA Annual Inspection Reports:	TVA Annual Inspection Reports from 1967 to 2008.
Geotechnical Data:	None available.

6. Stantec Field Observations

See attached Concerns/Photo Log, Photos, and Site Plan Drawing.

6.1. Interior Slopes

Vegetation:	Grass.
Trees:	None observed.
Wave Wash Protection:	Sporadic rip rap in places of past instabilities.
Erosion:	Wave erosion can be seen throughout interior slopes and internal dike between fly ash pond and stilling pond.
Instabilities:	Due to steepness of slope and erosion, numerous slumps and slides have occurred in the past. Some slumps were observed during the field assessment.
Animal Burrows:	None observed.
Freeboard:	<b>Measured:</b> 3.5 feet (all sections) <b>Design:</b> 4 feet (10N284)



**TVA Disposal Facility Assessment**  
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**Fly Ash Pond Area 2 (FAP2)**

Encroachments: None observed

Slope: **Measured:** 1H:1V (Section 9, 10, 11 and 13)  
2.5H:1V (Section 12)

**Design:** 2H:1V (10N214 and 10N284).

6.2. Crest

Crest Cover and Slope: Gravel road with grass shoulders.

Erosion: None.

Alignment: Good.

Settlement/Cracking: None observed.

Bare Spots/Rutting: None observed.

Width: **Measured:** 20 feet (Sections 9, 10, 12 and 13)  
12 feet (Section 11, divider dike)

**Design:** 16 feet (10N214)

6.3. Exterior Slopes

Vegetation: Grass.

Trees: Trees along river bank.

Erosion: None observed.

Instabilities: Certain slope areas are too steep and may be only marginally stable.

Uniform Appearance: Slopes are not uniform but are well vegetated. Tire ruts are noted on toe and slopes.

Seepage: Wet areas were observed along the toe and in tire ruts along south and west slopes. Main wet areas were in southwest corner near barge ties. Could not tell if this was local runoff or seepage.

Benches: 1 bench from toe of slope to slope of river bank. Width ranged from 12 feet to 24 feet.

Foundations, Drains, Relief Wells, Instrumentation: None observed.



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Animal Burrows:	Two animal burrows were observed in southwest corner.
Slope:	<b>Measured:</b> 1.7H to 1.5H:1V crest to bench. 2H:1V to 3H:1V bench to river <b>Design:</b> 2.H:1V (10N284)
Height:	<b>Measured:</b> 9 feet to 14 feet (crest to toe) <b>Design:</b> 20 feet (crest to toe, 10N284)

6.4. Spillway Weirs/Riser Inlets

Number:	3 located in Stilling Pond in west side of Area 2.
Size, Type and Material:	36" Concrete.
Height of Riser Inlets:	12.5 feet (riser to invert of outlet).
Access:	Floating walkway.
Joints:	Water was flowing over spillway, could not review.
Mis-Alignment:	Water was flowing over spillway, could not review.
Closed/Abandoned Conduits:	None found.

6.5. Outlet Pipes

Number:	Three (3) located in west side of Stilling Pond, discharging into Melton Reservoir/Clinch River.
Size, Type and Material:	36 inches Concrete.
Headwall:	None.
Joint Separations:	Past joint separations have been repaired.
Mis-Alignment:	None observed.
Closed/Abandoned Conduits:	Abandoned conduit located in south dike along Bull Run Creek. This might be former spillway abandoned in 1976. Unknown how it was abandoned and plugged.



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7. Notable Observations and Concerns

- Outlet from stilling pond is through three concrete riser structures discharging into the Clinch River. RCP push-together riser structure spillways are a concern. Some minor surging was noted during the field assessment.
- A significant amount of fly ash was accumulating in the pond during the field assessment. Ash could be seen in the water. At some places, only a foot of water was seen over the ash surface.
- Steep slopes were seen on the interior and exterior slopes of the ash pond. Several areas were observed on the interior slope where banks have slid towards the pond and are now protected with rock. These slopes were observed at steeper than 2H:1V in numerous places.
- Tire ruts were noticed on the exterior bench, toe and slope. These tire ruts are ponding water on the toe of the exterior slope. This was observed along the entire length of the exterior slope.
- Wet areas were noticed at the exterior slope toe in numerous places. Many wet areas were noted in tire ruts and may be localized ponding.
- Steep slopes, erosion and sloughs were noted on the divider dike between the ash pond and the stilling pond.
- Two animal burrows were noted on the exterior slope near the SW corner of the stilling pond.
- A small slough was noted on the west interior slope of the stilling pond above the rip rap. This occurred south of the riser structure spillways.

8. Recommendations

8.1. Phase 2 Engineering and Programmatic Recommendations

- It is recommended that a geotechnical evaluation be done for the Active Fly Ash Pond/Stilling Pond Area 2 based on slope stability concerns. This evaluation could include implementation of a monitoring program including installation of piezometers and inclinometers. Based the results of this evaluation, further analysis might be needed.
- Due to the field observations of the quantity of ash being deposited in the pond as well as the lack of adequate freeboard, it is recommended that a hydrologic and hydraulic analysis be done to accurately determine the current maximum storage capacity within the pond.



**TVA Disposal Facility Assessment  
Phase 1 Coal Combustion Product Disposal  
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Bull Run Fossil Plant (BRF)  
Fly Ash Pond Area 2 (FAP2)**

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- Based on the findings of Phase 2 and designs from Phase 3, if performed, Stantec recommends that the existing O&M Manual be reviewed and updated. These updates may include sections on routine monitoring and facility maintenance.
- Evaluate the origin of the 24 inch concrete pipe in the south bank of Bull Run Creek. If this pipe is inactive, evaluate the adequacy of the abandonment and any leakage from the pipe. If needed, develop and implement a pipe abandonment plan.

## 8.2. Maintenance Recommendations

- Monitor the area near the current spillway outlets for increased flow due to leakage through riser joints. Also monitor for leakage through the ground surface coming from potential abandoned spillways that could be caused by improper abandonment procedures.
- Repair animal burrows where noted.
- Active Fly Ash Pond/Stilling Pond Area 2 may need to be dredged of deposited ash to increase capacity.
- Repair erosion and sloughed areas where noted on interior slopes of ponds. Line interior pond slopes with rip-rap to help reduce future erosion.
- Continue mowing program on slopes but avoid leaving deep ruts from mowing on side slopes. This was especially evident on the exterior slopes of the Fly Ash Pond Area 2. Also, cut back brush on slopes.
- Continue to monitor areas of noted seeps and wet areas on a consistent basis.



**TVA Disposal Facility Assessment  
Phase 1 Coal Combustion Product Disposal  
Facility Summary  
Bull Run Fossil Plant (BRF)  
East/West Dredge Cell (EWDC)**

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1. General Facility Information

Facility Status: Inactive

Surface Area: 23 acres (estimated)      Maximum Height (toe to top of stack): 70 feet (measured)

2. Site Visit Information

Stantec Assessment Team: Roger Denick, PE and John Beam, PG

TVA Staff Present: Travis Markum

Field Assessment Dates: January 15, 2009 and February 14, 2009

Weather/Site Conditions: lower 20 degrees F, partly sunny (January 15, 2009); low to mid 50 degrees F, sunny (February 14, 2009). Some moisture from overnight rain on February 14, 2009.

3. History/Description of Usage

History, Operation and Stacking Plan: The East/West Dredge Cell (originally called Ash Disposal Area Inside Railroad Loop) went online in 1981 to receive dredged fly ash from the Active Fly Ash Pond Area 2. Dredged ash was piped to the east and west pond area at the foot of the hill and bounded by the railroad embankment for disposal. Each pond had a concrete riser structure which discharged into Melton Reservoir. Due to instabilities with the railroad embankment, ash was removed from the ponds and placed on the adjacent hillside in 1986. Ash was periodically dredged from Area 2 and placed in the east and west ponds starting again in 1990 until 1995 when it was officially closed. Currently, this area is inactive.

Stacking over Dredge Cells or CCB Ponds: No. Stacking was done on the hillside adjacent to ponds. Ponds have been filled and closed.

Past Failures/Releases: No failures or releases reported.



**TVA Disposal Facility Assessment  
Phase 1 Coal Combustion Product Disposal  
Facility Summary  
Bull Run Fossil Plant (BRF)  
East/West Dredge Cell (EWDC)**

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4. Owner's Operations, Maintenance and Inspection Information

TVA Maintenance:	Mowing and removal of excess vegetation on the ponds and dry stacks are done once per year. The drainage ditches are cleaned out and roads regraded once or twice a year. Other maintenance work is done on an as-needed basis.
TVA Inspections:	TVA Engineering performs annual dike inspections and prepares reports. Plant personnel also perform quarterly red water seep inspections.
Problems Previously Identified During Past TVA Inspections:	Red water seep and standing water on eastern toe (2007-current).

5. Documents Reviewed

See attached Document Log for complete list of documents provided by TVA for review. In particular, the following provided pertinent information for the assessment of this facility:

TVA Design Drawings:	Drawing number 10W294-1 through 10W294-11, 10W289-1 through 10W289-7.
TVA As-Built Drawings:	None available.
TVA Construction Testing Records:	None available.
TVA Annual Inspection Reports:	TVA Annual Inspection Reports from 1967 to 2008.
Geotechnical Data:	None available.

6. Stantec Field Observations

See attached Concerns/Photo Log, Photos, and Site Plan Drawing.

6.1. Exterior Slopes and Benches

Vegetation:	Grass.
Trees:	None observed
Erosion:	Minor erosion along east rip rap channel.



**TVA Disposal Facility Assessment  
Phase 1 Coal Combustion Product Disposal  
Facility Summary  
Bull Run Fossil Plant (BRF)  
East/West Dredge Cell (EWDC)**

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Instabilities:	None observed.
Uniform Appearance	Good.
Benches:	Three (3) main benches, each 20 feet wide.
Slope:	All slopes measured as 2H:1V except bottom most slope which was 4H:1V (Section 14).
Height:	Approx. 70 feet (Section 14).
Other:	Animal burrow noted near 12 inch drainage pipe in drainage ditch along west side toe.

#### 6.2. Perimeter Drainage Ditches and Down-Drains

Vegetation:	Grass, dense at times. Vegetation appears to be affecting grade and encouraging standing water in drainage ditches along toe and in ditch to spillways.
Rip-Rap Channel Lining:	None present in ditches. Rip rap present around spillway.
Erosion:	None observed.
Siltation in Ditches:	None observed.
Standing Water in Ditches or on Benches:	Standing water observed on all three benches. 1 <sup>st</sup> bench downslope from top of stack had standing water on west side. Next two benches had standing water on east side. Bottom bench was largest and in area of red water seep noted in previous inspections.
Silted/Impeded Drainage Pipes:	CMP culvert on top of stack in west rip rap channel has been driven over and appears to be draining the wrong way (see observations).
Other:	None.



**TVA Disposal Facility Assessment  
Phase 1 Coal Combustion Product Disposal  
Facility Summary  
Bull Run Fossil Plant (BRF)  
East/West Dredge Cell (EWDC)**

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7. Notable Observations and Concerns

- Standing water is noticed at the toe of the dredge cell on the east side. This area extends over 200 feet from the rip rap channel along the toe. Some reddish discoloration is noticed in the water as well as oil sheen. This area has been noted in past inspection reports for a red water seep. No movement was noticed in the water.
- Standing water is observed around the outlet riser pipes near the railroad. The standing water extends both east and west along the perimeter with the railroad track and to the rip rap channels on the dredge cell.
- Truck ruts are noted on the top of the dredge cell. Truck ruts near the west corner have standing water in them.
- Drainage channels along the bottom of the dredge cell to the outlet structure contained brush and heavy vegetation. A fallen tree had also dammed up a portion of the drainage channel on the west side.
- Culvert is seen on the top of the dredge cell in the west rip rap channel. The culvert pipe is not covered and has been driven over. Culvert pipe is also above the grade of the rip rap and appears to be angled the wrong way.

8. Recommendations

8.1. Phase 2 Engineering and Programmatic Recommendations

- It is recommended that a current Operations and Maintenance Plan be developed for this facility.

8.2. Maintenance Recommendations

- Repair tire ruts where noted and encourage TVA employees to only drive on areas that have gravel roads or better.
- Repair animal burrows where noted.
- Remove excess vegetation, brush and trees that have accumulated in runoff drainage channels
- Continue to monitor areas of noted seeps and wet areas on a consistent basis.



**TVA Disposal Facility Assessment  
Phase 1 Coal Combustion Product Disposal  
Facility Summary  
Bull Run Fossil Plant (BRF)  
Dry Fly Ash Stack (DS1)**

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1. General Facility Information

Facility Status: Active (Phase II)

Surface Area: 50 acres (Phase I and II)      Maximum Height (toe to top of stack): 56 feet (estimated)

2. Site Visit Information

Stantec Assessment Team: Roger Denick, PE and John Beam, PG

TVA Staff Present: Travis Markum

Field Assessment Dates: January 15, 2009 and February 15, 2009

Weather/Site Conditions: Lower 20 degrees F, partly sunny (January 15, 2009) and mid 40 degrees F, sunny (February 15, 2009).

3. History/Description of Usage

History, Operation and Stacking Plan: The Dry Fly Ash Stack is located north of the coal stack and went online in 1982 to receive dry fly ash. The stack is divided into two phases, I and II. Phase I is located on the north portion of the stack and was completed and covered in 1993. Phase II is located on the south portion of the Dry Fly Ash Stack and came online in the early 1990's and is still in operation. Currently approximately 240,000 tons of dry fly ash is collected in a silo each year and hauled to an onsite permitted dry stack disposal area (Dry Fly Ash Stack).

Stacking over Dredge Cells or CCB Ponds: None.

Past Failures/Releases: No failures or releases reported.

4. Owner's Operations, Maintenance and Inspection Information

TVA Maintenance: Mowing and removal of excess vegetation on the ponds and dry stacks are done once per year. The drainage ditches are cleaned out and roads regraded once or twice a year. Other maintenance work is done on an as-needed basis.



**TVA Disposal Facility Assessment  
Phase 1 Coal Combustion Product Disposal  
Facility Summary  
Bull Run Fossil Plant (BRF)  
Dry Fly Ash Stack (DS1)**

TVA Inspections:	TVA Engineering performs annual dike inspections and prepares reports. Plant personnel also perform quarterly red water seep inspections.
Problems Previously Identified During Past TVA Inspections:	Slump in south side perimeter dike (1994). Large seep with sloughing on western dike of Phase I (1998-2001). Seep found in north side of Phase I (2004-2005). Seep found east of existing seep in north side Phase I (2005-2006). Slope failure on west face of Phase I (2006).

5. Documents Reviewed

See attached Document Log for complete list of documents provided by TVA for review. In particular, the following provided pertinent information for the assessment of this facility:

TVA Design Drawings:	Drawing Numbers 10W293-1 through 10W293-6.
TVA As-Built Drawings:	None available.
TVA Construction Testing Records:	None available.
TVA Annual Inspection Reports:	TVA Annual Inspection Reports from 1967 to 2008.
Geotechnical Data:	None available.

6. Stantec Field Observations

See attached Concerns/Photo Log, Photos, and Site Plan Drawing.

6.1. Exterior Slopes and Benches

Vegetation:	Grass, good.
Trees:	None observed.
Erosion:	Minor erosion gullies were noted at the interface between Phase I and Phase II on the south side.
Instabilities:	None observed.



**TVA Disposal Facility Assessment**  
**Phase 1 Coal Combustion Product Disposal**  
**Facility Summary**  
**Bull Run Fossil Plant (BRF)**  
**Dry Fly Ash Stack (DS1)**

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Uniform Appearance	Good.
Benches:	2 benches with 10 foot widths (Section 19).
Slope:	3H:1V and flatter.
Height:	Approximately 56 feet above access road (Section 19).
Other:	Possible seeps noted on northeast side (see observations).

6.2. Perimeter Drainage Ditches and Down-Drains

Vegetation:	Grass, dense at places.
Rip-Rap Channel Lining:	Rip rap channel located on top of stack on Phase I, draining from north end of stack into drainage channel. Drainage channels are not rip rapped.
Erosion:	Erosion pool was observed in the drainage ditch below a 10 inch HDPE drainage pipe from the top of the stack.
Siltation in Ditches:	None observed.
Standing Water in Ditches or on Benches:	Numerous wet area were observed in the drainage ditches and benches in Phase I (see observations).
Silted/Impeded Drainage Pipes:	Concrete drainage pipe on the slope near interface of Phase I and Phase II on the south side was half full of silt.
Other:	

7. Notable Observations and Concerns

- Erosion pool located under 10 inch HDPE drainage pipe from top of stack to drainage channel on north side of Phase II.
- Two 10 inch HDPE drainage pipes were located on south side of Phase II and carried runoff from top of stack to sediment pond. On the east most pipe, one of the joints had been separated and tied together with rope. Ponding water was noticed below this joint. The west most pipe did not reach the pond and was discharging onto the ground.



**TVA Disposal Facility Assessment  
Phase 1 Coal Combustion Product Disposal  
Facility Summary  
Bull Run Fossil Plant (BRF)  
Dry Fly Ash Stack (DS1)**

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- At the 24 inch culvert noted on north end of Phase II, the upstream flange was separated and the pipe had some deterioration.
- Standing water was noticed on toe near road on northeast side of Phase I. Several possible seeps observed but no flowing water. This area had been noted for seeps in past inspection reports.
- Wetness was observed on the southeast corner upslope from the drainage channel near the road.
- Concrete pipe and headwall observed on south side of Phase II near the interface with Phase I. Pipe was full of silt and there was noticeable wetness below the pipe on the slope.
- Drainage channels (especially in Phase I) have dense grass vegetation which is impeding the drainage of runoff and causing localized wet areas.

## 8. Recommendations

### 8.1. Phase 2 Engineering and Programmatic Recommendations

- Review of documents and drawings for this facility have shown that the latest drawing for this area was done in 1982 (10W293 series) and does not accurately depict current conditions. It is recommended that a current drawing set be prepared for this area to accurately depict current conditions.
- Based on the findings of Phase 2 and designs from Phase 3, if performed, Stantec recommends that the existing O&M Manual be reviewed and updated. These updates may include sections on routine monitoring and facility maintenance.

### 8.2. Maintenance Recommendations

- Continue to monitor areas of noted seeps and wet areas on a consistent basis.
- Repair animal burrows where noted.
- Continue mowing program and keep drainage channels clear of excess vegetation. The drainage channels should be cleared on a more frequent basis than the mowing program to provide positive drainage and reduce a wet condition along current toe of the stack.



**TVA Disposal Facility Assessment**  
**Phase 1 Coal Combustion Product Disposal**  
**Facility Summary**  
**Bull Run Fossil Plant (BRF)**  
**Dry Fly Ash Stack Sediment Pond (DSP)**

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1. General Facility Information

Facility Status:	Active	NID Identification:	N/A
Surface Area (inside dikes):	3 acres	Maximum Height (toe to top of dike):	N/A
Free Water Volume:	Unknown	Maximum Water Storage:	Unknown
Estimated CCB Storage:	N/A	Dike Length:	N/A
Plant Discharge to Facility:	N/A	Current Pool Elevation:	815 (estimated)

2. Site Visit Information

Stantec Assessment Team:	Roger Denick, PE and John Beam, PG
TVA Staff Present:	Travis Markum
Field Assessment Dates:	January 15, 2009 and February 15, 2009
Weather/Site Conditions:	lower 20 degrees F, partly sunny (January 15, 2009) and mid 40 degrees F, sunny (February 15, 2009)

3. History/Description of Usage

History and Operation:	The Dry Fly Ash Stack Sediment Pond came online with Phase I of the Dry Fly Ash Stack and was originally a 90 feet x 130 feet pond to take runoff from Phase I (drawing 10W293-1). The pond was expanded with Phase II in the early 1990's and discharges to the Coal Yard Drainage Pond through a 60 inch concrete culvert. The current spillway is a concrete box riser structure with 3 sets of 2 inch diameter holes spaced approximately 1 foot off center to allow low flow to pass. The pond is a depression with no actual embankments.
Past Failures/Releases:	No failures or releases reported.



**TVA Disposal Facility Assessment  
Phase 1 Coal Combustion Product Disposal  
Facility Summary  
Bull Run Fossil Plant (BRF)  
Dry Fly Ash Stack Sediment Pond (DSP)**

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4. Owner's Operations, Maintenance and Inspection Information

Emergency Action Plan:	No EAP has been prepared for this facility.
Operations Manual:	An Operations Manual is present for Bull Run Fossil Plant Area 1 and 2A, Ash and Gypsum Disposal Operations Plan (TVA,2004).
TVA Maintenance:	Mowing and removal of excess vegetation on the ponds and dry stacks are done once per year. The drainage ditches are cleaned out and roads regraded once or twice a year. Other maintenance work is done on an as-needed basis.
TVA Inspections:	TVA Engineering performs annual dike inspections and prepares reports. Plant personnel also perform quarterly red water seep inspections.
Problems Previously Identified During Past TVA Inspections:	None reported.

5. Documents Reviewed

See attached Document Log for complete list of documents provided by TVA for review. In particular, the following provided pertinent information for the assessment of this facility:

TVA Design Drawings:	Drawing Numbers 10W293-1 through 10W293-6.
TVA As-Built Drawings:	None available.
TVA Construction Testing Records:	None available.
TVA Annual Inspection Reports:	TVA Annual Inspection Reports from 1967 to 2008.
Geotechnical Data:	None available.



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**Bull Run Fossil Plant (BRF)**  
**Dry Fly Ash Stack Sediment Pond (DSP)**

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6. Stantec Field Observations

See attached Concerns/Photo Log, Photos, and Site Plan Drawing.

6.1. Interior Slopes

Vegetation:	No vegetation on south and west side, grass, small brush on north and east side.
Trees:	None observed.
Wave Wash Protection:	None observed.
Erosion:	Erosion was noted on the southeast side of the pond measuring 4 feet wide by 1.5 feet deep along interior slope.
Instabilities:	None observed.
Animal Burrows:	None observed.
Freeboard:	<b>Measured:</b> 5 feet (Section 15) 8 feet (Section 16) <b>Design:</b> Approximately 5 feet (10W293-4)
Encroachments:	None observed.
Slope:	<b>Measured:</b> 1.6H:1V (Section 15) 2H:1V (Section 16) <b>Design:</b> Not known.

6.2. Crest

Crest Cover and Slope:	Pond is depression, no crest.
Erosion:	N/A
Alignment:	N/A
Settlement/Cracking:	N/A
Bare Spots/Rutting:	N/A
Width:	<b>Measured:</b> N/A <b>Design:</b> N/A



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**Bull Run Fossil Plant (BRF)**  
**Dry Fly Ash Stack Sediment Pond (DSP)**

---

6.3. Exterior Slopes

Vegetation:	N/A	
Trees:	N/A	
Erosion:	N/A	
Instabilities:	N/A	
Uniform Appearance:	N/A	
Seepage:	N/A	
Benches:	N/A	
Foundations, Drains, Relief Wells, Instrumentation:	N/A	
Animal Burrows:	N/A	
Slope:	<b>Measured:</b>	N/A
	<b>Design:</b>	N/A
Height:	<b>Measured:</b>	N/A
	<b>Design:</b>	N/A

6.4. Spillway Weirs/Riser Inlets

Number:	One (1) - 3 foot by 7 foot box riser.
Size, Type and Material:	Spillway is a concrete box riser with three columns of two inch diameter seep holes on side. Outlet from riser structure is 60 inch concrete culvert flowing into the Coal Yard Drainage Pond.
Height of Riser Inlets:	Unknown.
Access:	On west bank of pond.
Joints:	Box riser.
Mis-Alignment:	None observed.
Closed/Abandoned Conduits:	None observed.



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Phase 1 Coal Combustion Product Disposal  
Facility Summary  
Bull Run Fossil Plant (BRF)  
Dry Fly Ash Stack Sediment Pond (DSP)**

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6.5. Outlet Pipes

Number:	One (1)
Size, Type and Material:	60 inch concrete culvert.
Headwall:	Yes
Joint Separations:	No
Mis-Alignment:	None observed.
Closed/Abandoned Conduits:	None observed.

7. Notable Observations and Concerns

- Pond works in conjunction with the Dry Fly Ash Stack and controls runoff from area.
- Pond is a depression and does not have any measurable crest or embankments.
- A 24 inch and a 16 inch pipe were observed at the southeast corner of the pond. The origin of these pipes is unknown. Minor erosion was observed below the outlets.
- Minor erosion was observed along the west and south interior banks. These banks had little vegetation. This pond is a depression so this is not a stability issue.

8. Recommendations

8.1. Phase 2 Engineering and Programmatic Recommendations

- Review of documents and drawings for this facility have shown that the latest drawing for this area was done in 1982 (10W293 series) and does not accurately depict current conditions. It is recommended that a current drawing set be prepared for this area to accurately depict current conditions.
- Based on the findings of Phase 2 and designs from Phase 3, if performed, Stantec recommends that the existing O&M Manual be reviewed and updated. These updates may include sections on routine monitoring and facility maintenance.



**TVA Disposal Facility Assessment  
Phase 1 Coal Combustion Product Disposal  
Facility Summary  
Bull Run Fossil Plant (BRF)  
Dry Fly Ash Stack Sediment Pond (DSP)**

---

8.2. Maintenance Recommendations

- Repair erosion and sloughed areas where noted on interior slopes of ponds. Line interior pond slopes with rip-rap to help reduce future erosion.
- Establish vegetation on interior slopes on south and west side to reduce erosion.
- The 24 inch and 16 inch pipes in the southeast corner of the pond needs to be evaluated to determine origin and current status. If it is determined the pipe are out of service or not properly abandoned, an abandonment plan need to be formulated and implemented.



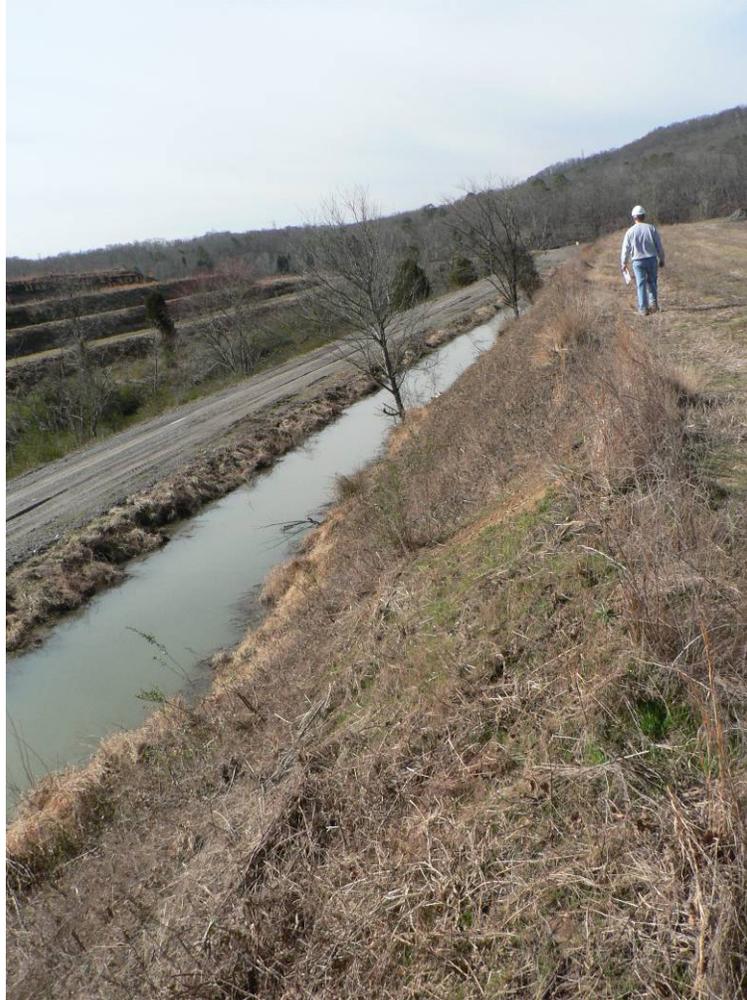
Drawing Mark BAD-1-1

Typical side slope on west side of bottom ash stack showing standing water in drainage ditch.



Drawing Mark BAD-1-2

Tire ruts on slope and lower bench on west side of bottom ash disposal area.



Drawing Mark BAD-1-3 View of side slope and standing water in drainage ditch on south side of bottom ash disposal area.



Drawing Mark BAD-1-4 Possible animal burrow on south side slope near drainage ditch.



Drawing Mark BAD-1-5 Red water seep area on the lower south slope along channel between the Bottom Ash Disposal Area 1 and Gypsum Disposal Area 2A.



**TVA Disposal Facility Assessment  
Phase 1 Coal Combustion Product Disposal Facility Summary  
Bull Run Fossil Plant (BRF)  
Bottom Ash Disposal Area 1  
Photos, Concerns/Photo Log**



**Drawing Mark BAD-1-6** Confluence of ash channel and drainage ditch on south side of the bottom ash disposal area showing settlement of fly ash in channel.



**Drawing Mark BAD-1-7** Disjointed discharge pipes from top of bottom ash disposal area.



Drawing Mark BAD-1-8 Erosion gully near north end of ash pond with loose concrete slab covering edge of gully on east side of bottom ash disposal area.



Drawing Mark BAD-1-9 Cut in stack for stockpile area showing void between soil layer and ash.



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**TVA Disposal Facility Assessment  
Phase 1 Coal Combustion Product Disposal Facility Summary  
Bull Run Fossil Plant (BRF)  
Bottom Ash Disposal Area 1  
Photos, Concerns/Photo Log**

<b>Concerns/Photo Log</b>		
<b>Drawing Mark</b>	<b>Comments</b>	<b>Photo/GPS ID</b>
BAD-1-1	Typical side slope on west side of bottom ash stack showing standing water in diversion ditch.	BRP1B1364
BAD-1-2	Tire ruts on slope and lower bench on west side of bottom ash disposal area.	BRP1B1374
BAD-1-3	View of side slope and standing water in drainage ditch on south side of bottom ash disposal area.	BRP1B1401
BAD-1-4	Possible animal burrow on south side slope near drainage ditch.	BRP1B1405
BAD-1-5	Red water seep area on the lower south slope along channel between the Bottom Ash Disposal Area 1 and Gypsum Disposal Area 2A.	BRP1B1411
BAD-1-6	Confluence of ash channel and drainage ditch on south side of the bottom ash disposal area showing settlement of fly ash in channel.	BRP1B1397
BAD-1-7	Disjointed discharge pipes from top of Bottom Ash Disposal Area.	BRP1B1429
BAD-1-8	Erosion gully near north end of ash pond with loose concrete slab covering edge of gully on east side of bottom ash disposal area.	BRP1B1418
BAD-1-9	Cut in stack for stockpile area showing void between soil layer and ash.	BRP1B1423



Drawing Mark GDA-2A-1

Standing water in roadside drainage ditch on north side of Gypsum Disposal Area 2A.



Drawing Mark GDA-2A-2

Stagnate water in drainage channel on north end of west side of gypsum disposal area.



Drawing Mark GDA-2A-3 Ponding water in drainage channel on west side of gypsum disposal area.



Drawing Mark GDA-2A-4 Interior slope erosion (typical) within the gypsum disposal area.



Drawing Mark GDA-2A-5 Depression on south end of gypsum disposal area.



Drawing Mark GDA-2A-6 Erosion gully on south end of gypsum disposal area



Drawing Mark GDA-2A-7 Partially soil filled lateral outlet pipe on south side intermediate bench.



Drawing Mark GDA-2A-8 Damaged lateral outlet pipe on south side intermediate bench.



Drawing Mark GDA-2A-9 Covered lateral outlet pipe at base of south side of gypsum disposal area entering fly ash pond.



Drawing Mark GDA-2A-10 Separated and partially soil covered lateral outlet pipe on east side of gypsum disposal area.



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**TVA Disposal Facility Assessment  
Phase 1 Coal Combustion Product Disposal Facility Summary  
Bull Run Fossil Plant (BRF)  
Gypsum Disposal Area 2A  
Photos, Concerns/Photo Log**

<b>Concerns/Photo Log</b>		
<b>Drawing Mark</b>	<b>Comments</b>	<b>Photo/GPS ID</b>
GDA-2A-1	Standing water in roadside drainage ditch on north side of Gypsum Disposal Area 2A.	BRP1B1410
GDA-2A-2	Stagnate water in drainage channel on north end of west side of gypsum disposal area.	BRP1B1491
GDA-2A-3	Ponding water in drainage channel on west side of gypsum disposal area.	BRP1B1485
GDA-2A-4	Interior slope erosion (typical) within the gypsum disposal area.	BRP1A623
GDA-2A-5	Depression on south end of gypsum disposal area.	BRP1B1479
GDA-2A-6	Erosion gully on south end of gypsum disposal area.	BRP1B1480
GDA-2A-7	Partially soil filed lateral outlet pipe on south side intermediate bench.	BRP1B1467
GDA-2A-8	Damaged lateral outlet pipe on south side intermediate bench.	BRP1B1469
GDA-2A-9	Covered lateral outlet pipe at base of south side of gypsum disposal area entering fly ash pond.	BRP1B1474
GDA-2A-10	Separated and partially soil covered lateral outlet pipe on east side of gypsum disposal area.	BRP1B1459



Drawing Mark FAP-2-1

Tire ruts and wet area on south side, east corner of fly ash pond.



Drawing Mark FAP-2-2

Steep exterior slope on south side fly ash pond.



Drawing Mark FAP-2-3

Possible beaver burrow on south side of fly ash pond near outlet of concrete pipe along creek.



Drawing Mark FAP-2-4

Separated concrete pipe of unknown origin entering creek.



Drawing Mark FAP-2-5 Weir area at southeast portion of pond..-



Drawing Mark FAP-2-6 Steep, irregular slopes and overall conditions of inner levee between fly ash pond and stilling pond.



**Drawing Mark FAP-2-7** Three spillway structures on northwest side of pond.



**Drawing Mark FAP-2-8** Steep slopes with tire ruts and possible slumping on west side of stilling pond.



Drawing Mark FAP-2-9      Slump on interior cresting of stilling pond along west side dike.



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**TVA Disposal Facility Assessment**  
**Phase 1 Coal Combustion Product Disposal Facility Summary**  
**Bull Run Fossil Plant (BRF)**  
**Fly Ash Pond Area 2**  
**Photos, Concerns/Photo Log**

<b>Concerns/Photo Log</b>		
<b>Drawing Mark</b>	<b>Comments</b>	<b>Photo/GPS ID</b>
FAP-2-1	Tire ruts and wet area on south side, east corner of fly ash pond.	BRP1B1526
FAP-2-2	Steep exterior slope on south side fly ash pond.	BRP1B1509
FAP-2-3	Separated concrete pipe of unknown origin entering creek.	BRP1B1517
FAP-2-4	Possible beaver burrow on south side of fly ash pond near outlet of concrete pipe along creek.	BRP1B1523
FAP-2-5	Weir area at southeast portion of pond.	BRP1A736
FAP-2-6	Steep, irregular slopes and overall conditions of inner levee between fly ash pond and stilling pond.	BRP1B1528
FAP-2-7	Three spillway structures on northwest side of pond.	BRP1A782
FAP-2-8	Steep slopes with tire ruts and possible slumping on west side of stilling pond.	BRP1A762
FAP-2-9	Slump on interior crest of stilling pond along west side dike.	BRP1B1550



Drawing Mark EWDC-1-1 Overall view of the East and West Dredge Cells.



Drawing Mark EWDC-1-2 View of east side lower slope and bottom area showing standing water and reddish soils.



Drawing Mark EWDC-1-3 Red water seep and standing water at bottom of slope on east side of dredge cell.



Drawing Mark EWDC-1-4 Tire ruts creating a depression and wet area on top of dredge cell.



Drawing Mark EWDC-1-5  
CMP culvert on top of stack that is partially covered, dented, and appeared to drain the wrong direction.



Drawing Mark EWDC-1-6  
Standing water around outlets on the southeast side of the East and West Dredge Cells.



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TVA Disposal Facility Assessment  
Phase 1 Coal Combustion Product Disposal Facility Summary  
Bull Run Fossil Plant (BRF)  
East and West Dredge Cells  
Photos, Concerns/Photo Log

Concerns/Photo Log		
Drawing Mark	Comments	Photo/GPS ID
EWDC-1-1	Overall view of the East and West Dredge Cells.	BRP1B1556
EWDC-1-2	View of east side lower slope and bottom area showing standing water and reddish soils.	BRP1B1591
EWDC-1-3	Red water seep and standing water at bottom of slope on east side of dredge cell.	BRP1B1608
EWDC-1-4	Tire ruts creating a depression and wet area on top of dredge cell.	BRP1B1600
EWDC-1-5	CMP culvert that is partially covered, dented, and appeared to drain the wrong direction.	BRP1B1601
EWDC-1-6	Standing water around outlets on southeast side of the East and West Dredge Cells.	BRP1B1566



Drawing Mark DSP-1-1 Overall view of Dry Fly Ash Stack Drainage Pond.



Drawing Mark DSP-1-2 View of outlet facility and side slopes for ash stack sediment pond.



Drawing Mark DSP-1-3      Bare slopes near outlet to ash stack sediment pond.





Drawing Mark DS-1-1

Inlet pipes down embankment slope to sediment pond diversion, shifted on slope from past storm event.



Drawing Mark DS-1-2

Tied discharge pipes at separation on bench on the southern side of Dry Fly Ash Stack.



Drawing Mark DS-1-3

Erosion at outlet end of ash drainage discharge pipe at diversion ditch to sediment pond.



Drawing Mark DS-1-4

Silted concrete pipe and headwall on southern portion of Dry Fly Ash Stack. Note water below outlet.



Drawing Mark DS-1-5

Typical slopes near seepage area on northeast portion of lower slope of Dry Fly Ash Stack.



Drawing Mark DS-1-6

Closeup of standing water in seep area on northeast portion of Dry Fly Ash Stack.



Drawing Mark DS-7

Erosion pool below outlet pipe on the east side of Phase I area of dry stack.



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**TVA Disposal Facility Assessment**  
**Phase 1 Coal Combustion Product Disposal Facility Summary**  
**Bull Run Fossil Plant (BRF)**  
**Dry Fly Ash Stack Sediment Pond**  
**Photos, Concerns/Photo Log**

<b>Concerns/Photo Log</b>		
<b>Drawing Mark</b>	<b>Comments</b>	<b>Photo/GPS ID</b>
DS-1-1	Inlet pipes down embankment slope to sediment pond diversion, shifted on slope from past storm event.	BRP1B1693
DS-1-2	Tied discharge pipes at separation on bench on the southern side of Dry Fly Ash Stack.	BRP1B1640
DS-1-3	Erosion at outlet end of ash drainage discharge pipe at diversion ditch to sediment pond.	BRP1B1641
DS-1-4	Silted concrete pipe and headwall on southern portion of Dry Fly Ash Stack. Note water below outlet.	BRP1B1692
DS-1-5	Typical slopes near seepage area on northeast portion of lower slope of Dry Fly Ash Stack.	BRP1A858
DS-1-6	Closeup of standing water in seep area on northeast portion of Dry Fly Ash Stack.	BRP1B1689
DS-1-7	Erosion pond below outlet on the east side of Phase 1 area of dry stack.	BRP1B1670



**Coal Combustion Product Disposal Facility Assessment  
Phase 1 Document Review Form  
Bull Run Fossil Plant (BRF)**

Date Reviewed	Reviewed by	File Name	File Type
3/30/2009	RAD	1963-03_BRF-10N230-Sht -Rev 9.cal	CAL
3/30/2009	RAD	1963-03_BRF-10N231-Sht -Rev 8.cal	CAL
3/30/2009	RAD	1963-09_BRF-10N233-Sht -Rev 3.cal	CAL
3/30/2009	RAD	1963-10_BRF-10N238-Sht -Rev 2.cal	CAL
3/30/2009	RAD	1963-11_BRF-10N237-Sht -Rev 2.cal	CAL
3/30/2009	RAD	1964-03_BRF-10N240-Sht -Rev 2.cal	CAL
3/30/2009	RAD	1964-03_BRF-10N241-Sht -Rev 1.cal	CAL
3/30/2009	RAD	1964-07_BRF-10N232-Sht -Rev 2.cal	CAL
2/11/2009	RAD	1966-10_BRF-10N209-Sht -Rev 3 Main Plant Ash Disposal Areas Supplemental Details Sheet 2.cal	CAL
3/30/2009	RAD	1966-10_BRF-10N209-Sht -Rev 3.cal	CAL
3/30/2009	RAD	1967-10_BRF-10N208-Sht -Rev 2.cal	CAL
3/13/2009	RAD	1975-11_BRF-10E285-Sht -Rev 0 Main Plant Fly Ash Disposal Area No 2 Catwalk To Water Level Monitoring Station.cal	CAL
2/11/2009	RAD	1977-02_BRF-10W287-Sht -Rev 1 Main Plant Relocated Dike For Ash Disposal Lines Under L & N Railroad.cal	CAL
3/27/2009	RAD	1979 - BRF Dredge 2A No5 604G986 R0.pdf	PDF
2/11/2009	RAD	1979-07_BRF-10W288-Sht -Rev 1 Main Plant Reclaimed Ash Disposal Area No. 1 Grading Plan.cal	CAL
3/13/2009	RAD	1982-06_BRF-10W293-1-Sht -Rev 2 Main Plant Ash Disposal Area North Of Coal Pile Sheet 1.cal	CAL
3/13/2009	RAD	1982-06_BRF-10W293-2-Sht -Rev 1 Main Plant Ash Disposal Area North Of Coal Pile Sheet 2.cal	CAL
3/13/2009	RAD	1982-11_BRF-10W293-3-Sht -Rev 3 Main Plant Ash Disposal Area North Of Coal Pile Sheet 3.cal	CAL
3/13/2009	RAD	1982-12_BRF-10W293-4-Sht -Rev 3 Main Plant Ash Disposal Area North Of Coal Pile Sheet 4.cal	CAL
3/13/2009	RAD	1982-12_BRF-10W293-5-Sht -Rev 1 Main Plant Ash Disposal Area North Of Coal Pile Sections & Details.cal	CAL
3/13/2009	RAD	1982-12_BRF-10W293-Sht 4-Rev 0.cal	CAL
3/27/2009	RAD	1985 - Bull Run Steam Plant Ashponds1And2Asoil Investigationoesoilsschedule814.pdf	PDF
3/27/2009	RAD	1985 - Bull Run Steam Plant Ashponds1And2Asoil Investigationoesoilsschedule814.pdf	PDF
3/27/2009	RAD	1985 - BullRunsteamplantashponds1And2Asoilinvestigationoesoilsschedule814.pdf	PDF
3/27/2009	RAD	1985 - BullRunsteamplantashponds1And2Asoilinvestigationoesoilsschedule814.pdf	PDF
3/30/2009	RAD	1985 - BullRunsteamplantashstorageareasnorthwestofrailroadloopandtherailroadloopsoilsinvestigationoesoilsschedule816.pdf	PDF
3/30/2009	RAD	1985 - BullRunsteamplantflyashstackinrailroadloopndsoilschedule819.pdf	PDF
3/30/2009	RAD	1985 - BullRunsteamplantailroadloopandnwofrrlooprrembankmentscheduleno.pdf	PDF
3/30/2009	RAD	1985 - BullRunsteamplantailroadloopborrowinvestigation.pdf	PDF
2/11/2009	RAD	1986-04_BRF-10W294-Sht -Rev 0 Main Plant Ash Disposal Area North Of Coal Pile Sections And Details.cal	CAL
2/11/2009	RAD	1986-04_BRF-10W294-Sht -Rev 1 Main Plant Ash Disposal Area North Of Coal Pile Sections And Details.cal	CAL
3/30/2009	RAD	1987 - BullRunfossilplantrailroadlogoby Soilsgroupsanalysis.pdf	PDF
3/27/2009	RAD	1989 - BullRunfossilplantanassessmentofthephaseiiflyashdrystackingwr28149104.pdf	PDF
3/27/2009	RAD	1989 - BullRunfossilplantleachategenerationfromdrystackedflyashpart1Fieldexperiments.pdf	PDF
3/27/2009	RAD	1989 - BullRunfossilplantreportofageotechnicalexplorationdisposalponddikestrtatetestinganddrillingmarch1989.pdf	PDF
3/27/2009	RAD	1989 - BullRunfossilplantreportofageotechnicalexplorationdisposalponddikestrtatetestinganddrillingmarch1989.pdf	PDF
3/27/2009	RAD	1990 - BullRunfossilplanttradkendricktoeoliveraugust151990Subsurfaceexplorationandsitegeotechnicalassessment.pdf	PDF
3/30/2009	RAD	1992 - BullRunfossilplantconstructionqualitycontrolfordryflyashstackstage1Closuresreport209004087A.pdf	PDF



**Coal Combustion Product Disposal Facility Assessment  
Phase 1 Document Review Form  
Bull Run Fossil Plant (BRF)**

Date Reviewed	Reviewed by	File Name	File Type
3/30/2009	RAD	1993 - Bull Run Fossil Plant Qualitycontrolforflyashstackiexistinggeologicbuffersreport209004112A.pdf	PDF
2/10/2009	RAD	1993-12_BRF-10W293-6-Sht -Rev 0 Main Plant Ash Disposal Area North Of Coal Pile Sections And Details.cal	CAL
2/10/2009	RAD	1994-10_BRF-10W290-2-Sht -Rev 4 Powerhouse Unit 1 Civil Electrostatic Fly-Ash Collector Paving And Grading Plan.cal	CAL
3/30/2009	RAD	1995 - BullRunfossilplantnovember81995Qaqcofconstructionfortheremaininglowerhalfofstageiidryflyashstackingfacilitiesreport.pdf	PDF
3/30/2009	RAD	1998-06_BRF-10W257-Sht -Rev 1.cal	CAL
3/27/2009	RAD	2004 - BRF Ash Disposal Area No1.tif	TIF
3/27/2009	RAD	2004 - BRF Ash Disposal Area No1.tif	TIF
3/27/2009	RAD	2004 - Bull Run Fossil Plant Mactec Reportofgeotechnicalexplorationashdisposalareajuly132004.pdf	PDF
3/27/2009	RAD	2004 - Bull Run Fossil Plant Mactec Reportofgeotechnicalexplorationashdisposalareajuly132004.pdf	PDF
3/27/2009	RAD	2006 - BullRunfossilplantmacteclettertoronpurkeymarch82006Reportoffieldinvestigationofashmaterials.pdf	PDF
2/11/2009	RAD	Br27631.cal	CAL
2/12/2009	JDB/RAD	BRF 2009 Ash Pond Inspection Tdec -- Plant Walkdown Results.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy2000.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy2001.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy2002.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy2004.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy2005.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy2006.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy2007.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy67.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy68.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy69.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy70.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy71.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy72.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy73.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy74.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy75.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy76.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy77.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy78.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy79.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy80.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy81.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy82.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy83.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy84.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy85.pdf	PDF



**Coal Combustion Product Disposal Facility Assessment  
Phase 1 Document Review Form  
Bull Run Fossil Plant (BRF)**

Date Reviewed	Reviewed by	File Name	File Type
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy86.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy87.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy88.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy89.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy90.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy93.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy94.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy95.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy96.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy97.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy98.pdf	PDF
2/12/2009	JDB/RAD	BRF Ash Pond Insp Fy99.pdf	PDF
3/30/2009	RAD	BRF Blackwhite 10W296-1 No2.pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inpsection (1994).pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inpsection (1995).pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inpsection (1996).pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inpsection (1997).pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inpsection (1998).pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inpsection (1999).pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inpsection (2000).pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inpsection (2001).pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inpsection (2002).pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inpsection (2003).pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inpsection (2004).pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inpsection (2005).pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inpsection (2006).pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inpsection (2007).pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inpsection (2008) & Plant Follow-Up.pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inpsection (2008).pdf	PDF
2/12/2009	JDB/RAD	BRF Dike Stability Inspection (1-9-09) S&Me Report.pdf	PDF
3/27/2009	RAD	BRF Dredge Cell 2A Graph No4.pdf	PDF
3/13/2009	RAD/JDB	BRF Geotechnical Engg Aug18 2005 Prep For Advatech By Urs.pdf	PDF
3/6/2009	RAD	BRF Operations Manual Area 1 And 2A Ash And Gypsum Disposal Revision A August 30 2004.pdf	PDF
3/13/2009	RAD/JDB	BRF Operations Manual Gypsum And Ash Disposal Areas 1 1A 2A Volume 2 Nov 2004 Rev July 2005.pdf	PDF
3/27/2009	RAD	BRF Permit Ash Disposal Areas ! And @A Drawings November 1999.pdf	PDF
2/12/2009	JDB/RAD	BRF Quarterly Red Water Seep Inspections (1993-2008).pdf	PDF
3/13/2009	RAD/JDB	BRF Report Of Geotechnical Exploration East And West Ash Disposal Areas Mactec Engineering And Consulting Inc Aug 18 2004 Mactec Project 304304103701.pdf	PDF



**Coal Combustion Product Disposal Facility Assessment  
Phase 1 Document Review Form  
Bull Run Fossil Plant (BRF)**

Date Reviewed	Reviewed by	File Name	File Type
2/12/2009	JDB/RAD	BRF Site Map (071393).pdf	PDF
2/10/2009	RAD	BRF-10Ds410-Sht 1-Rev 2 U1 Ash Sluice Pipe Trench & Supports.cal	CAL
2/10/2009	RAD	BRF-10E285-Sht -Rev 0 Main Plant Fly Ash Disposal Area No 2 Catwalk To Water Level Monitoring Station.cal	CAL
2/10/2009	RAD	BRF-10H294-10-Sht -Rev 0 Yard Dry Ash Stack-Northwest Of Rr Loop Miscellaneous Ditch Protection Details.cal	CAL
2/10/2009	RAD	BRF-10H294-11-Sht -Rev 0 Yard Dry Ash Stack-Northwest Of Rr Loop Highway - Railroad Grade Crossing Details.cal	CAL
2/10/2009	RAD	BRF-10H294-9-Sht -Rev 0 Yard Dry Ash Stack-Northwest Of Rr Loop Pipe Culvert Installation & Bedding Details.cal	CAL
2/10/2009	RAD	BRF-10N207-Sht -Rev 4 Yard Car Wash Finished Grading And Paving Plan.cal	CAL
2/11/2009	RAD	BRF-10N207-Sht -Rev 4 Yard Car Wash Finished Grading And Paving Plan.cal	CAL
2/11/2009	RAD	BRF-10N208-Sht -Rev 2 Main Plant Ash Disposal Areas Supplemental Details Sheet 1.cal	CAL
2/10/2009	RAD	BRF-10N213-Sht -Rev 14 Main Plant Ash Disposal Areas And Dikes.cal	CAL
2/11/2009	RAD	BRF-10N213-Sht -Rev 14 Main Plant Ash Disposal Areas And Dikes.cal	CAL
2/10/2009	RAD	BRF-10N214-Sht -Rev 4 Main Plant Ash Disposal Areas Supplemental Details Sheet 3.cal	CAL
2/11/2009	RAD	BRF-10N214-Sht -Rev 4 Main Plant Ash Disposal Areas Supplemental Details Sheet 3.cal	CAL
2/11/2009	RAD	BRF-10N232-Sht -Rev 2 Yard Drainage Details Coal Area.cal	CAL
2/11/2009	RAD	BRF-10N251-Sht -Rev 3 Yard Coal Yard Surfacing.cal	CAL
2/10/2009	RAD	BRF-10N280-Sht -Rev 3 Main Plant Ash Disposal Area Connection Area 1 & Area 2 Sheet 1.cal	CAL
2/11/2009	RAD	BRF-10N280-Sht -Rev 3 Main Plant Ash Disposal Area Connection Area 1 & Area 2 Sheet 1.cal	CAL
2/10/2009	RAD	BRF-10N281-Sht -Rev 2 Main Plant Ash Disposal Area Connection Area 1 & Area 2 Sheet 2.cal	CAL
2/11/2009	RAD	BRF-10N281-Sht -Rev 2 Main Plant Ash Disposal Area Connection Area 1 & Area 2 Sheet 2.cal	CAL
2/10/2009	RAD	BRF-10N282-Sht -Rev 1 Standard Drawing Ash Disposal Spillway.cal	CAL
2/11/2009	RAD	BRF-10N282-Sht -Rev 1 Standard Drawing Ash Disposal Spillway.cal	CAL
2/10/2009	RAD	BRF-10N283-Sht -Rev 0 Standard Drawing Weir For Ash Disposal Spillway.cal	CAL
2/11/2009	RAD	BRF-10N283-Sht -Rev 0 Standard Drawing Weir For Ash Disposal Spillway.cal	CAL
2/10/2009	RAD	BRF-10N284-Sht -Rev 2 Main Plant Ash Disposal Areas Supplemental Details Sheet 4.cal	CAL
2/11/2009	RAD	BRF-10N284-Sht -Rev 2 Main Plant Ash Disposal Areas Supplemental Details Sheet 4.cal	CAL
2/10/2009	RAD	BRF-10N292-Sht -Rev 0 Main Plant Ash Disposal Areas Divider Dike Skimmer & Access Catwalk To Spillway.cal	CAL
2/11/2009	RAD	BRF-10N292-Sht -Rev 0 Main Plant Ash Disposal Areas Divider Dike Skimmer & Access Catwalk To Spillway.cal	CAL
2/11/2009	RAD	BRF-10N340-Sht -Rev 0 Yard Unit 1 Concrete Cable Tunnel To Coal Structures Plan & Profile.cal	CAL
2/11/2009	RAD	BRF-10N353-Sht -Rev 2 Coal Handling Facilities Unit 1 Concrete Access To Manhole No. 8 Outline & Reinforcement.cal	CAL
2/11/2009	RAD	BRF-10N410-Sht -Rev 6 Yard Unit 1 Concrete Ash Sluice Pipe Trench & Supports Outline & Reinf - Sheet .cal	CAL
2/11/2009	RAD	BRF-10N411-Sht -Rev 5 Yard Unit 1 Concrete Ash Sluice Pipe Trench & Supports Outline & Reinforcement - Sheet 2.cal	CAL
2/11/2009	RAD	BRF-10N412-Sht -Rev 4 Yard Unit 1 Concrete Ash Sluice Pipe Trench & Supports Outline & Reinf - Sheet 3.cal	CAL
2/10/2009	RAD	BRF-10W204-Sht -Rev 3 Main Plant Fly-Ash Collecting System Areas Available For Contractor Use During Const.cal	CAL
2/11/2009	RAD	BRF-10W211-Sht -Rev 9 Main Plant General Grading Plan Coal Yard.cal	CAL
2/10/2009	RAD	BRF-10W258-1-Sht -Rev 5 Yard-Dry Fly-Ash Collection System Unit 1 Finished Grading,Drainage & Paving Plan - Sheet 1.cal	CAL
2/11/2009	RAD	BRF-10W258-1-Sht -Rev 5 Yard-Dry Fly-Ash Collection System Unit 1 Finished Grading,Drainage & Paving Plan - Sheet 1.cal	CAL
2/10/2009	RAD	BRF-10W258-2-Sht -Rev 2 Yard-Dry Fly-Ash Collection System Unit 1 Finished Grading,Drainage & Paving Plan - Sheet 2.cal	CAL
2/11/2009	RAD	BRF-10W258-2-Sht -Rev 2 Yard-Dry Fly-Ash Collection System Unit 1 Finished Grading,Drainage & Paving Plan - Sheet 2.cal	CAL



**Coal Combustion Product Disposal Facility Assessment  
Phase 1 Document Review Form  
Bull Run Fossil Plant (BRF)**

Date Reviewed	Reviewed by	File Name	File Type
2/10/2009	RAD	BRF-10W259-1-Sht -Rev 3 Yard Ash Pipe Trench Sump Plan.cal	CAL
2/10/2009	RAD	BRF-10W259-2-Sht -Rev 3 Yard Ash Pipe Trench Sump Details & Sections.cal	CAL
2/10/2009	RAD	BRF-10W259-3-Sht -Rev 2 Yard Ash Pipe Trench Sump Details & Sections.cal	CAL
2/11/2009	RAD	BRF-10W286-Sht -Rev 0 Main Plant Chemical Treatment Pond Plan And Details.cal	CAL
2/11/2009	RAD	BRF-10W288-Sht -Rev 1 Main Plant Reclaimed Ash Disposal Area No. 1 Grading Plan.cal	CAL
2/10/2009	RAD	BRF-10W289-1-Sht -Rev 3 Main Plant Ash Disposal Area Inside Loop Track Plan.cal	CAL
2/10/2009	RAD	BRF-10W289-2-Sht -Rev 3 Main Plant Ash Disposal Area Inside Loop Track Sections & Details.cal	CAL
2/10/2009	RAD	BRF-10W289-3-Sht -Rev 2 Main Plant - Yard Ash Disposal Area Inside Loop Track Stacking Plan.cal	CAL
2/10/2009	RAD	BRF-10W289-4-Sht -Rev 2 Main Plant - Yard Ash Disposal Area Inside Loop Track Stacking Plan Sections.cal	CAL
2/10/2009	RAD	BRF-10W289-6-Sht -Rev 1 Main Plant Ash Disposal Area Inside Loop Track - Closure Grading Plan .cal	CAL
2/10/2009	RAD	BRF-10W289-7-Sht -Rev 1 Main Plant Ash Disposal Area Inside Loop Track - Closure Sections & Monitoring Wells.cal	CAL
3/13/2009	RAD	BRF-10W289-Sht 4-Rev 0.cal	CAL
2/10/2009	RAD	BRF-10W290-2-Sht -Rev 4 Powerhouse Unit 1 Civil Electrostatic Fly-Ash Collector Paving And Grading Plan.cal	CAL
2/10/2009	RAD	BRF-10W290-2-Sht -Rev 5 Powerhouse Unit 1 Civil Electrostatic Fly-Ash Collector Paving And Grading Plan.cal	CAL
2/10/2009	RAD	BRF-10W290-3-Sht -Rev 3 Powerhouse Unit One Civil Electrostatic Fly Ash Collector Paving And Grading Plan.cal	CAL
2/10/2009	RAD	BRF-10W290-3-Sht -Rev 4 Powerhouse Unit One Civil Electrostatic Fly Ash Collector Paving And Grading Plan.cal	CAL
2/11/2009	RAD	BRF-10W293-1-Sht -Rev 2 Main Plant Ash Disposal Area North Of Coal Pile Sheet 1.cal	CAL
2/11/2009	RAD	BRF-10W293-2-Sht -Rev 1 Main Plant Ash Disposal Area North Of Coal Pile Sheet 2.cal	CAL
2/11/2009	RAD	BRF-10W293-3-Sht -Rev 3 Main Plant Ash Disposal Area North Of Coal Pile Sheet 3.cal	CAL
2/11/2009	RAD	BRF-10W293-4-Sht -Rev 3 Main Plant Ash Disposal Area North Of Coal Pile Sheet 4.cal	CAL
2/11/2009	RAD	BRF-10W293-5-Sht -Rev 1 Main Plant Ash Disposal Area North Of Coal Pile Sections & Details.cal	CAL
2/11/2009	RAD	BRF-10W293-6-Sht -Rev 0 Main Plant Ash Disposal Area North Of Coal Pile Sections And Details.cal	CAL
3/5/2009	RAD	BRF-10W293-Sht 4-Rev 0.cal	CAL
2/10/2009	RAD	BRF-10W294-12-Sht -Rev 0 Yard Ash Disposal Area - 2A Plan Section & Details Stack Grading.cal	CAL
2/10/2009	RAD	BRF-10W294-1-Sht -Rev 0 Yard Dry Ash Track-Northwest Of Rr Loop Retention Pond Stack Base & Haul Road Grading & Drainage Plan.cal	CAL
2/10/2009	RAD	BRF-10W294-2-Sht -Rev 0 Yard Dry Ash Stack-Northwest Of Rr Loop Haul Road Grading Drainage And Miscellaneous Sections .cal	CAL
2/10/2009	RAD	BRF-10W294-3-Sht -Rev 0 Yard Dry Ash Stack-Northwest Of Rr Loop Stacking Plan And Haul Road.cal	CAL
2/10/2009	RAD	BRF-10W294-4-Sht -Rev 0 Yard Dry Ash Stack-Northwest Of Rr Loop Haul Road & Stack Misc Sections & Profiles.cal	CAL
2/10/2009	RAD	BRF-10W294-5-Sht -Rev 0 Yard Dry Ash Stack-Northwest Of Rr Loop Construction Notes.cal	CAL
2/10/2009	RAD	BRF-10W294-6-Sht -Rev 0 Yard Dry Ash Stack-Northwest Of Rr Loop Ash Disposal Area Spillways Type A & B.cal	CAL
2/10/2009	RAD	BRF-10W294-7-Sht -Rev 0 Yard Dry Ash Stack-Northwest Of Rr Loop Ash Disposal Area Skimmer Details.cal	CAL
2/10/2009	RAD	BRF-10W294-8-Sht -Rev 0 Yard Dry Ash Stack-Northwest Of Rr Loop Ash Disposal Area Gravity Drain.cal	CAL
2/10/2009	RAD	BRF-10W294-Sht -Rev 0 Main Plant Ash Disposal Area North Of Coal Pile Sections And Details.cal	CAL
2/10/2009	RAD	BRF-10W294-Sht -Rev 1 Main Plant Ash Disposal Area North Of Coal Pile Sections And Details.cal	CAL
2/10/2009	RAD	BRF-10W297-10-Sht -Rev 0 Yard Gypsum & Ash Disposal Existing Conditions Sheet 4.cal	CAL
2/10/2009	RAD	BRF-10W297-11-Sht -Rev 0 Yard Gypsum & Ash Disposal Initial Site Grading Sheet 1.cal	CAL
2/10/2009	RAD	BRF-10W297-12-Sht -Rev 0 Yard Gypsum & Ash Disposal Initial Site Grading Sheet 2 .cal	CAL



**Coal Combustion Product Disposal Facility Assessment  
Phase 1 Document Review Form  
Bull Run Fossil Plant (BRF)**

Date Reviewed	Reviewed by	File Name	File Type
2/10/2009	RAD	BRF-10W297-13-Sht -Rev 0 Yard Gypsum & Ash Disposal Initial Site Grading Sheet 3.cal	CAL
2/10/2009	RAD	BRF-10W297-14-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 1 Sheet 1.cal	CAL
2/10/2009	RAD	BRF-10W297-15-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 1 Sheet 2.cal	CAL
2/10/2009	RAD	BRF-10W297-16-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 1 Sheet 3.cal	CAL
2/10/2009	RAD	BRF-10W297-17-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 2 Sheet 1 .cal	CAL
2/10/2009	RAD	BRF-10W297-18-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 2 Sheet 2.cal	CAL
2/10/2009	RAD	BRF-10W297-19-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 2 Sheet 3.cal	CAL
2/10/2009	RAD	BRF-10W297-1-Sht -Rev 0 Yard Gypsum & Ash Disposal Drawing Index And Legend.cal	CAL
2/10/2009	RAD	BRF-10W297-20-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 3 Sheet 1.cal	CAL
2/10/2009	RAD	BRF-10W297-21-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 3 Sheet 2.cal	CAL
2/10/2009	RAD	BRF-10W297-22-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 3 Sheet 3.cal	CAL
2/10/2009	RAD	BRF-10W297-23-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 4 Sheet 1.cal	CAL
2/10/2009	RAD	BRF-10W297-24-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 4 Sheet 2.cal	CAL
2/10/2009	RAD	BRF-10W297-25-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 4 Sheet 3.cal	CAL
2/10/2009	RAD	BRF-10W297-26-Sht -Rev 0 Yard Gypsum & Ash Disposal Area 2A Sections.cal	CAL
2/10/2009	RAD	BRF-10W297-27-Sht -Rev 0 Yard Gypsum & Ash Disposal Area 2A Sections.cal	CAL
2/10/2009	RAD	BRF-10W297-28-Sht -Rev 0 Yard Gypsum & Ash Disposal Area 1A Sections.cal	CAL
2/10/2009	RAD	BRF-10W297-29-Sht -Rev 0 Yard Gypsum & Ash Disposal Areas 1 & 1A Sections.cal	CAL
2/10/2009	RAD	BRF-10W297-2-Sht -Rev 0 Yard Gypsum & Ash Disposal Site Location Plan.cal	CAL
2/10/2009	RAD	BRF-10W297-30-Sht -Rev 0 Yard Gypsum & Ash Disposal Miscellaneous Details Sheet 1.cal	CAL
2/10/2009	RAD	BRF-10W297-31-Sht -Rev 0 Yard Gypsum & Ash Disposal Metal Spillway Details Sheet 2.cal	CAL
2/10/2009	RAD	BRF-10W297-32-Sht -Rev 0 Yard Gypsum & Ash Disposal Typical Cross Section & Details Sheet 3.cal	CAL
2/10/2009	RAD	BRF-10W297-33-Sht -Rev 0 Yard Existing Ash Disposal Details Sheet 4.cal	CAL
2/10/2009	RAD	BRF-10W297-34-Sht -Rev 0 Yard Gypsum & Ash Disposal Cover, Culvert & Road Details Compacted Clay Final Cover.cal	CAL
2/10/2009	RAD	BRF-10W297-35-Sht -Rev 0 Yard Gypsum & Ash Disposal Geocomposite Final Cover.cal	CAL
2/10/2009	RAD	BRF-10W297-36-Sht -Rev 0 Yard Gypsum & Ash Disposal Drainage Plan, Roads, & Ditch Schedule Final Cover.cal	CAL
2/10/2009	RAD	BRF-10W297-37-Sht -Rev 0 Yard Gypsum & Ash Disposal Ditch Details & Notes Final Cover.cal	CAL
2/10/2009	RAD	BRF-10W297-38-Sht -Rev 0 Yard Gypsum & Ash Disposal Waste Disposal Options Stage 1.cal	CAL
2/10/2009	RAD	BRF-10W297-39-Sht -Rev 0 Yard Gypsum & Ash Disposal Waste Disposal Options Stage 2.cal	CAL
2/10/2009	RAD	BRF-10W297-3-Sht -Rev 0 Yard Gypsum & Ash Disposal Phasing Sheet 1.cal	CAL
2/10/2009	RAD	BRF-10W297-40-Sht -Rev 0 Yard Gypsum & Ash Disposal Dredge Cell Plan.cal	CAL
2/10/2009	RAD	BRF-10W297-4-Sht -Rev 0 Yard Gypsum & Ash Disposal Phasing Sheet 2.cal	CAL
2/10/2009	RAD	BRF-10W297-5-Sht -Rev 0 Yard Gypsum & Ash Disposal Layout Plan Initial Grading.cal	CAL
2/10/2009	RAD	BRF-10W297-6-Sht -Rev 0 Yard Gypsum & Ash Disposal Layout Plan Final Cover.cal	CAL
2/10/2009	RAD	BRF-10W297-7-Sht -Rev 0 Yard Gypsum & Ash Disposal Existing Conditions Sheet 1.cal	CAL
2/10/2009	RAD	BRF-10W297-8-Sht -Rev 0 Yard Gypsum & Ash Disposal Existing Conditions Sheet 2.cal	CAL
2/10/2009	RAD	BRF-10W297-9-Sht -Rev 0 Yard Gypsum & Ash Disposal Existing Conditions Sheet 3.cal	CAL
2/10/2009	RAD	BRF-10W298-10-Sht -Rev 0 Yard Gypsum & Ash Disposal Existing Conditions Sheet 4.cal	CAL



**Coal Combustion Product Disposal Facility Assessment  
Phase 1 Document Review Form  
Bull Run Fossil Plant (BRF)**

Date Reviewed	Reviewed by	File Name	File Type
2/10/2009	RAD	BRF-10W298-11-Sht -Rev 0 Yard Gypsum & Ash Disposal Initial Site Grading Sheet 1.cal	CAL
2/10/2009	RAD	BRF-10W298-12-Sht -Rev 0 Yard Gypsum & Ash Disposal Initial Site Grading Sheet 2.cal	CAL
2/10/2009	RAD	BRF-10W298-13-Sht -Rev 0 Yard Gypsum & Ash Disposal Initial Site Grading Sheet 3.cal	CAL
2/10/2009	RAD	BRF-10W298-14-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 1 Sheet 1 .cal	CAL
2/10/2009	RAD	BRF-10W298-15-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 1 Sheet 2.cal	CAL
2/10/2009	RAD	BRF-10W298-16-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 1 Sheet 3.cal	CAL
2/10/2009	RAD	BRF-10W298-17-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 2 Sheet 1.cal	CAL
2/10/2009	RAD	BRF-10W298-18-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 2 Sheet 2.cal	CAL
2/10/2009	RAD	BRF-10W298-19-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 2 Sheet 3.cal	CAL
2/10/2009	RAD	BRF-10W298-1-Sht -Rev 0 Yard Gypsum & Ash Disposal Drawing Index And Legend .cal	CAL
2/10/2009	RAD	BRF-10W298-20-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 3 Sheet 1.cal	CAL
2/10/2009	RAD	BRF-10W298-21-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 3 Sheet 2.cal	CAL
2/10/2009	RAD	BRF-10W298-22-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 3 Sheet 3.cal	CAL
2/10/2009	RAD	BRF-10W298-23-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 4 Sheet 1.cal	CAL
2/10/2009	RAD	BRF-10W298-24-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 4 Sheet 2.cal	CAL
2/10/2009	RAD	BRF-10W298-25-Sht -Rev 0 Yard Gypsum & Ash Disposal Stage 4 Sheet 3.cal	CAL
2/10/2009	RAD	BRF-10W298-26-Sht -Rev 0 Yard Gypsum & Ash Disposal Area 2A Sections.cal	CAL
2/10/2009	RAD	BRF-10W298-27-Sht -Rev 0 Yard Gypsum & Ash Disposal Area 2A Sections.cal	CAL
2/10/2009	RAD	BRF-10W298-28-Sht -Rev 0 Yard Gypsum & Ash Disposal Area 1A Sections.cal	CAL
2/10/2009	RAD	BRF-10W298-29-Sht -Rev 0 Yard Gypsum & Ash Disposal Areas 1 & 1A Sections.cal	CAL
2/10/2009	RAD	BRF-10W298-2-Sht -Rev 0 Yard Gypsum & Ash Disposal Site Location Plan .cal	CAL
2/10/2009	RAD	BRF-10W298-30-Sht -Rev 0 Yard Gypsum & Ash Disposal Miscellaneous Details Sheet 1.cal	CAL
2/10/2009	RAD	BRF-10W298-31-Sht -Rev 0 Yard Gypsum & Ash Disposal Metal Spillway Details Sheet 2.cal	CAL
2/10/2009	RAD	BRF-10W298-32-Sht -Rev 0 Yard Gypsum & Ash Disposal Typical Cross Section & Details Sheet 3.cal	CAL
2/10/2009	RAD	BRF-10W298-33-Sht -Rev 0 Yard Existing Ash Disposal Details Sheet 4 .cal	CAL
2/10/2009	RAD	BRF-10W298-34-Sht -Rev 0 Yard Gypsum & Ash Disposal Cover, Culvert & Road Details Compacted Clay Final Cover.cal	CAL
2/10/2009	RAD	BRF-10W298-35-Sht -Rev 0 Yard Gypsum & Ash Disposal Geocomposite Final Cover.cal	CAL
2/10/2009	RAD	BRF-10W298-36-Sht -Rev 0 Yard Gypsum & Ash Disposal Drainage Plan, Roads, & Ditch Schedule Final Cover.cal	CAL
2/10/2009	RAD	BRF-10W298-37-Sht -Rev 0 Yard Gypsum & Ash Disposal Ditch Details & Notes Final Cover.cal	CAL
2/10/2009	RAD	BRF-10W298-38-Sht -Rev 0 Yard Gypsum & Ash Disposal Waste Disposal Options Stage 1 .cal	CAL
2/10/2009	RAD	BRF-10W298-39-Sht -Rev 0 Yard Gypsum & Ash Disposal Waste Disposal Options Stage 2 .cal	CAL
2/10/2009	RAD	BRF-10W298-3-Sht -Rev 0 Yard Gypsum & Ash Disposal Phasing Sheet 1 .cal	CAL
2/10/2009	RAD	BRF-10W298-40-Sht -Rev 0 Yard Gypsum & Ash Disposal Wick Drain Arrangement .cal	CAL
2/10/2009	RAD	BRF-10W298-41-Sht -Rev 0 Yard Gypsum & Ash Disposal Typical Cross-Sections And Details.cal	CAL
2/10/2009	RAD	BRF-10W298-42-Sht -Rev 0 Yard Gypsum & Ash Disposal Cleanout & Standpipe Details .cal	CAL
2/10/2009	RAD	BRF-10W298-4-Sht -Rev 0 Yard Gypsum & Ash Disposal Phasing Sheet 2 .cal	CAL
2/10/2009	RAD	BRF-10W298-5-Sht -Rev 0 Yard Gypsum & Ash Disposal Layout Plan Initial Grading.cal	CAL
2/10/2009	RAD	BRF-10W298-6-Sht -Rev 0 Yard Gypsum & Ash Disposal Layout Plan Final Cover.cal	CAL



**Coal Combustion Product Disposal Facility Assessment  
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Date Reviewed	Reviewed by	File Name	File Type
2/10/2009	RAD	BRF-10W298-7-Sht -Rev 0 Yard Gypsum & Ash Disposal Existing Conditions Sheet 1.cal	CAL
2/10/2009	RAD	BRF-10W298-8-Sht -Rev 0 Yard Gypsum & Ash Disposal Existing Conditions Sheet 2.cal	CAL
2/10/2009	RAD	BRF-10W298-9-Sht -Rev 0 Yard Gypsum & Ash Disposal Existing Conditions Sheet 3.cal	CAL
3/30/2009	RAD	Bull Run Ash Storage Facility Soils Investigation.pdf	PDF
3/30/2009	RAD	Bull Run Dry Fly Ash Collection Facility Spec Manual.pdf	PDF
3/30/2009	RAD	Bull Run Dry Fly Ash Storage Geologic Buffer Report.pdf	PDF
3/30/2009	RAD	Bull Run Fossil Plant Book No 4D.pdf	PDF
3/30/2009	RAD	Bull Run Fossil Plant Develop Dredgecell Pond 2A Pcn5058.pdf	PDF
3/30/2009	RAD	Bull Run Fossil Plant Drainage Substitution Phase I li Rlp July 29 2005.pdf	PDF
3/30/2009	RAD	Bull Run Fossil Plant Dup Constr Quality Control For Dly Fly Ash Stack Stage 1 Closure.pdf	PDF
3/30/2009	RAD	Bull Run Fossil Plant Duplicate Constr Quality Control For Dly Fly Ash Stack Stage 1 Closure.pdf	PDF
3/30/2009	RAD	Bull Run Fossil Plant EdgemoorroadentranceBRF041011.pdf	PDF
3/30/2009	RAD	Bull Run Fossil Plant Folder Qa Qc Fgd.pdf	PDF
3/27/2009	RAD	Bull Run Fossil Plant Gypsum Disposalareaqaqcreports.pdf	PDF
3/30/2009	RAD	Bull Run Fossil Plant Permitashdisposalareas1And2Adrawingsnovember1999.pdf	PDF
3/27/2009	RAD	Bull Run Fossil Plant Wastedisposalandashstackingplandecember22005.pdf	PDF
3/30/2009	RAD	Bull Run Fossilplant Hydrogeologyofashdisposalareas1And2Aseptember1999.pdf	PDF
3/30/2009	RAD	Bull Run Permit Ash Disposal Areas 1 And2A Drawings Nov 1999.pdf	PDF
3/30/2009	RAD	Bull Run Solid Waste Landfill Application.pdf	PDF
3/30/2009	RAD	Bull Run Steam Plant Duplicate Fly Ash Stack In Railroad Loop Dnesoilsched 819.pdf	PDF
3/30/2009	RAD	Bull Run Steam Plant Duplicate Fly Ashstack In Railroad Loop Dne Soil Sched 819.pdf	PDF
3/30/2009	RAD	Bull Run Steam Plant Railroad Loop Borrow Investigation.pdf	PDF
2/10/2009	RAD	BullRun.pdf (this is an aerial view w/ structures located - also includes top and toe of dike elevations)	PDF
3/30/2009	RAD	BullRunfossilplantmemofvanmetertoglbuchananjune51980Ashdensityandgradationtestsendessoilsscheduleno812.pdf	PDF
3/27/2009	RAD	BullRunfossilplantoperationsmanualgypsumandashdisposalareas1Aand2Avolume1ldl010208November2004Revisedjuly2005.pdf	PDF
3/27/2009	RAD	BullRunfossilplantursfinalreportgeotechnicalenggaugust182005.pdf	PDF
3/13/2009	RAD	BullRunopsmanualgypsumandashdispareas1,1A,2Avol3.pdf	PDF
3/27/2009	RAD	BullRunopsmanualgypsumandashdispareas1,1A,2Avol3.pdf	PDF
3/13/2009	RAD	BullRunripperroomfloorbeaminspjune20-22,2001.pdf	PDF
3/13/2009	RAD	Permit Ash Disposal Areas 1 And2A Drawings Nov 1999.pdf	PDF
2/12/2009	JDB/RAD	S&Me Report 1431-09-010 Tva BRF.pdf	PDF