January 15, 2016

Big Rivers Electric Corporation
Disposal of Coal Combustion Residuals (CCR) from Electric Utilities Final Rule
CCR Impoundment Annual Inspection Report

CCR Surface Impoundment Information

Name:	Green Station CCR Surface Impoundment
Operator:	Sebree Generating Station
Address:	9000 Highway 2096 Robards, Kentucky 42452

Qualified Professional Engineer

Name:	David A. Lamb
Company:	Associated Engineers, Inc.
Kentucky P.E. Number:	17822

Regulatory Applicability

Per 40 CFR §257.83(b), annual inspections by a qualified professional engineer must ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards.

Annual inspections of any CCR surface impoundment must include, at a minimum: (1) a review of all previously generated information regarding the status and condition of the CCR unit, including, but not limited to, all operating records and publicly accessible internet site entries, design and construction drawings and other documentation; (2) a thorough visual inspection to identify indications of distress, unusual or adverse behavior, or malfunction of the CCR unit and appurtenant structures; and (3) a thorough visual inspection of hydraulic structures underlying the base of the CCR unit and passing through the dike of the CCR unit for structural integrity and continued safe and reliable operation.

Additionally, following each annual inspection, the qualified professional engineer must prepare an inspection report which documents the following: (1) any changes in geometry of the impounding structure since the previous annual inspection; (2) the location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection; (3) the approximate maximum, minimum, and present depth and elevation of the impounded water and CCR since the previous annual inspection; (4) the storage capacity of the impounding structure at the time of inspection; (5) the approximate volume of the impounded water and CCR at the time of the inspection; (6) any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing

conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit and appurtenant structures; and (7) any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection.

Inspection Description

This is the first annual inspection report for the Green Station CCR surface impoundment pursuant to the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities Final Rule which became effective April 17, 2015.

An inspection was conducted on December 1, 2015; commencing in the morning when the piezometers were measured and continuing intermittently throughout the day, first with a drive-by inspection and followed by an on-ground inspection. The inspection was conducted by Tim Brown P.E. and Matthew Lile of Associated Engineers, Inc. of Madisonville, Kentucky.

The inspection consisted of a visual assessment of the surface impoundment, embankments and discharge (refer to Aerial Photo of the surface impoundment and the Annual Inspection Checklist included with this report); and began on the downstream side of the west embankment. The inspection noted that the embankment crest is comprised of a gravel access road and the slope is vegetated with a flat drainage way formed along the base. The drainage way contained slowly flowing water.

The inspection continued to the south embankment which contains the discharge pipes (two corrugated steel pipes, each 24 inches in diameter) with some debris build-up at the pipe outlets. The toe of the embankment was wet with water draining to the east. Standing water and heavy vegetation (phragmites) were present along the length of the embankment toe. The gravel access road continues along the crest of the south embankment. Erosion, bare areas and depressions evident on the downstream slope were minimal. The western portion of the upstream slope of the embankment is lined with rip-rap and the eastern portion is lined with rip-rap and supports woody vegetation (phragmites). Much of the upstream side of the south embankment has been rip-rapped. The pipe intakes are through a concrete common headwall collection structure with a variable height steel debris deflector on each pipe intake. The pipe conveyances were inspected by remote camera on January 8, 2016 and found to be in acceptable operating condition.

Associated Engineers, Inc. will be retained to assist in developing measures to address maintenance items (e.g. erosion, bare spots, drainage issues, invasive vegetation, etc.) identified in this inspection description.

Inspection Report Specifications

(i) CCR Surface Impoundment Geometry

This is the first annual inspection report for the Green Station CCR surface impoundment pursuant to the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities Final Rule which became effective April 17, 2015 and will serve as the baseline for any geometric changes that may occur in the future.

(ii) CCR Surface Impoundment Instrumentation

This is the first annual inspection report for the Green Station CCR surface impoundment pursuant to the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities Final Rule which became effective April 17, 2015 and will serve as the baseline for Instrumentation Measurement changes that may occur in the future.

(ii) a – Piezometers

There are five piezometers associated with this surface impoundment.

ID	Northing	Easting	Top of Casing Elevation	Depth to Static Water Level	Static Water Elevation*
P-1A	480202.55	1492104.21	396.17	12.22 feet	383.95
P-2A	480186.48	1492464.48	395.98	13.95 feet	382.03
P-3A	480175.11	1492692.75	395.91	13.93 feet	381.98
P-6	480122.51	1492462.58	379.33	0.98 foot	378.35
P-7	480137.28	1492099.00	380.26	0.90 foot	379.36

*Value listed is the maximum recorded reading (water elevation) since commencement of the Final Rule requirement to monitor CCR surface impoundment instrumentation.

(ii) b – Water Level Indicator

There is a water level indicator located on the pump intake structure at the north end of the impoundment. The water level elevation at the time of the annual inspection was 394.8 feet above mean sea level.

(iii) CCR Surface Impoundment Contents Elevations

This is the first annual inspection report for the Green Station CCR surface impoundment pursuant to the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities Final Rule which became effective April 17, 2015 and will serve as the baseline for Instrumentation

Measurement changes that may occur in the future. As such, Minimum and Maximum depths and elevations of impounded water and CCR are not available.

Minimum depth of impounded water and CCR = Not Available

Minimum elevation of impounded water and CCR = Not Available

Maximum depth of impounded water and CCR = Not Available

Maximum elevation of impounded water and CCR = Not Available

Present depth of impounded water and CCR = 16 feet and 46 feet (at respective locations of maximum impounded water and CCR depths)

Present elevation of impounded water and CCR = 394 feet and 408 feet, respectively, above mean sea level

These approximate depths and respective elevations are based on the most recent (December 2015) flight derived topographic contours and bathymetric survey data.

(iv) CCR Surface Impoundment Storage Capacity

The remaining storage capacity is approximately 172,000 cubic yards (if CCR can be placed to the elevation of the current water surface). This volume was calculated based on the maximum allowable storage volume and the current volume of CCR stored in the facility based on the most recent bathymetric survey.

(v) CCR Surface Impoundment Contents Volumes

The approximate volume of impounded water and CCR is 981,000 cubic yards (approximate water volume = 172,000 cubic yards and approximate CCR volume = 809,000 cubic yards). This volume was calculated based on the maximum storage capacity, the current amount of CCR stored in the facility based on the most recent bathymetric survey, and the best available as-built data for the structure construction prior to placement of CCR.

(vi) CCR Surface Impoundment Structural, Operational, and Safety Items

Noted Deficiencies

No deficiencies were observed during the annual inspection.

(vii) CCR Surface Impoundment Changes

This is the first annual inspection report for the Green Station CCR surface impoundment pursuant to the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities Final Rule which became effective April 17, 2015 and will serve as the baseline for any future changes which may have affected the stability or operation of the CCR unit since the previous annual inspection.

BIG RIVERS ELECTRIC

SEBREE GENERATING STATION: GREEN STATION
CCR SURFACE IMPOUNDMENT

Job Number:	15-0140D
Date:	1/15/2016
Scale:	NOT TO SCALE
Drawn By:	E.J.A.

ASSOCIATED ENGINEERS, INC.
ENGINEERS • GEOLOGISTS • SURVEYORS

2740 North Main St. • Madisonville, KY 42431
Phone: (270) 821-7732 • Fax: (270) 821-7789

1001 Frederica St. • Owensboro, KY 42301
Phone: (270) 684-8450 • Fax: (270) 684-8449

www.associatedengineers.com

BREC Final Rule CCR Impoundment Annual Inspection Checklist

Generating Station:	Sebree	Weather:	Partly cloudy
Impoundment:	Green Station	Temperature (Degrees F):	44 (average)
Date:	December 1, 2015	Inspector/Qualified Person:	Tim Brown & Matthew Lile (AEI)

	ITEM	STATUS			OBSERVATIONS
		YES	NO	N/A	
1	**TOP OF DAM**				
	Visual settlement	☐	☒	☐	
	Misalignment	☐	☒	☐	
	Cracking	☐	☒	☐	
	Access road deterioration (potholes, rutting, etc.)	☒	☐	☐	Isolated potholes, animal burrows and ruts
2	**UPSTREAM SLOPE**				
	Any erosion	☒	☐	☐	
	Longitudinal cracks	☐	☒	☐	
	Transverse cracks	☐	☒	☐	
	Adequate vegetative cover	☐	☒	☐	Sporadic bare areas & invasive species monocultures where not rip-rapped
	Are trees growing on the slope	☐	☒	☐	
	Adequate riprap/slope protection	☒	☐	☐	
	Visual depressions	☐	☒	☐	
	Visual settlement	☐	☒	☐	
	Any stone deterioration	☐	☒	☐	
	Debris or trash present	☐	☒	☐	
3	**DOWNSTREAM SLOPE AND TOE**				
	Any erosion	☒	☐	☐	
	Longitudinal cracks	☐	☒	☐	
	Transverse cracks	☐	☒	☐	
	Adequate vegetative cover	☒	☐	☐	
	Are trees growing on the slope	☐	☒	☐	
	Visual depressions or bulges	☒	☐	☐	Tracking/rutting from tractor & mower tires
	Visual settlement	☐	☒	☐	
	Animal Burrows	☒	☐	☐	Sporadic animal borrows; primarily small rodent
	Are boils present at the toe or slopes	☐	☒	☐	
	Are drainage features obstructed or damaged	☒	☐	☐	Drainage ditch along toe has heavy vegetation impeding higher flows
	Are drainage features flowing	☒	☐	☐	
	Is seepage present	☐	☒	☐	

	ITEM	STATUS			OBSERVATIONS
		YES	NO	N/A	
	Is seepage or discharge carrying sediment	☐	☒	☐	
	Soft or spongy zones present	☒	☐	☐	
4	**ABUTMENTS**				
	Any erosion	☒	☐	☐	
	Visual differential movement	☐	☒	☐	
	Any cracks	☐	☒	☐	
	Are drainage features flowing	☐	☒	☐	
	Is seepage present	☐	☒	☐	
	Is seepage or discharge carrying sediment	☐	☒	☐	
5	**PRINCIPAL SPILLWAY**				
	Any deterioration of the spillway structure	☐	☒	☐	
	Any deterioration of the spillway conduit	☐	☒	☐	
	Spillway clear from obstructions	☒	☐	☐	
	Is the spillway functioning and discharging correctly	☒	☐	☐	
	Trash racks or skimmer operational	☒	☐	☐	
	Any signs of leakage with the structure or conduit	☐	☒	☐	
	Abnormally high or low pool elevation	☐	☒	☐	
6	**EMERGENCY SPILLWAY**				
	Any deterioration of the spillway structure	☐	☐	☒	
	Spillway clear from obstructions	☐	☐	☒	
	Signs or erosion or slope sloughing	☐	☐	☒	
	Adequate vegetative cover	☐	☐	☒	
	Signs of or currently discharging water	☐	☐	☒	
7	**VALVES/GATES**				
	Are the valves/gates operational	☐	☐	☒	
	Are the valves/gates broken or bent	☐	☐	☒	
	Are the valves/gates corroded or rusted	☐	☐	☒	
	Have the valves/gates been maintained	☐	☐	☒	
8	**HYDRAULIC STRUCTURES UNDER/THROUGH DAM**				
	Hydraulic structures under/through embankment are in safe and reliable operating condition	☒	☐	☐	
	Abnormal flow	☐	☒	☐	
	Abnormally colored discharge	☐	☒	☐	
	Debris or sediment in discharge	☐	☒	☐	
9	**SEEPAGE**				
	Seepage from toe drain	☐	☐	☒	

ITEM		STATUS			OBSERVATIONS
		YES	NO	N/A	
	Seepage from abutment drain	☐	☐	☒	
	Seepage from blanket drain	☐	☐	☒	
	Seepage from slope areas	☐	☒	☐	

DEFICIENCIES AND MAINTENANCE ITEMS

No deficiencies were observed during the annual inspection.

Professional Engineer Certification [Per 40 CFR §257.83(b)
Annual Inspections by a Qualified Professional Engineer

I hereby certify that myself or an agent under my review has prepared this Annual Inspection Report (Report), and being familiar with the provisions of the final rule to regulate the disposal of coal combustion residuals (CCR) as solid waste under subtitle D of the Resource Conservation and Recovery Act (RCRA), attest that this Report has been prepared in accordance with good engineering practices and meets the intent of 40 CFR Part 257.83(b). To the best of my knowledge and belief, the information contained in this Report is true, complete, and accurate.

David A. Lamb, P.E.

State of Kentucky License No. 17822

Date: 1-15-2016