

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

CCR Landfill Information

Name: Green Station CCR Landfill
Operator: Sebree Generating Station
Address: 9000 Highway 2096
Robards, KY 42452

Qualified Professional Engineer

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

Regulatory Applicability

Per 40 CFR §257.84(b), annual inspections by a qualified professional engineer must ensure that the design, construction, operation, and maintenance of the CCR landfill is consistent with recognized and generally accepted good engineering standards.

Annual inspections of any CCR landfill must include, at a minimum: (1) a review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., the results of inspections by a qualified person, and results of previous annual inspections); and (2) a visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit.

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 structure since the previous annual inspection, (2) the approximate volume of CCR at the time of the inspection, (3) 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 (4) any other change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.

Inspection Description

This is the first annual inspection report for the Green Station CCR landfill 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 2, 2015; commencing in the morning and continuing 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 landfill and associated drainage control features (refer to Aerial Photo of the landfill and the Annual Inspection Checklist included with this report); and began on the south side of the landfill. The inspection noted that the slope and benches are fairly well vegetated with some erosion and bare areas with some benches retaining standing water. The slope toe was not well drained and also retained standing water particularly in longitudinal ruts from tractor/mower tires. Some storm drain inlets have settled and surface runoff collects in a depression before reaching the outlet pipe invert elevation for conveyance to the downstream retention pond.

The inspection continued to the east side where the ditch along the toe is poorly drained. The inspection noted that the slope and benches are fairly well vegetated with some erosion and bare areas and with some benches retaining standing water. Additionally, poor drainage on benches has allowed direct and indirect infiltration into/through soil cover. Animal burrows were noted at several locations and the facility has retained a varmint control contractor to eradicate burrowing rodents and other small mammals. Vegetation in some areas was restricted by thick thatch from mowing and stands of phragmites or canary reed grass. Soil around several storm water inlets was eroded or disturbed by burrowing animals and surface runoff bypassed the inlet contributing to erosion or areas of standing water and a contractor has been retained to make necessary storm water inlet repairs. Some erosion extended from the top of the slope to the toe and some grading was irregular and disrupted proper drainage. At some locations the crest of the pile is flat and does not promote positive drainage to storm water conveyances resulting in storm water being directed to the interior active landfill area.

Inspection of the west side began in the northwest corner and proceeded south. The condition of the slope and benches was similar to areas previously inspected with the slope and benches being fairly well vegetated with some erosion and bare areas, and some benches retaining standing water. The backfill material has settled and eroded at some of the storm drain inlets. All storm water catchment inlets should be inspected to ensure proper installation and maintenance; if damaged, necessary repairs should be made.

Except for the west and east corners, which were inspected respectively as part of the west and east sides, the north side of the landfill provides access to the center of the pile where the majority of active CCR material placement is ongoing. Surface runoff from the working area is directed to storm water sedimentation/retention ponds located at the base of the slope. Area along the northwest perimeter has been disturbed in preparation of retaining wall construction for future vertical expansion.

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

Inspection Report Specifications

(i) CCR Landfill Geometry

This is the first annual inspection report for the Green CCR landfill 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 Landfill Volume

The approximate total volume of CCR contained in the unit at the time of inspection is 20.3 million cubic yards. This volume was calculated from available flight derived baseline topography compared to December 2015 flight derived topographic contours.

(iii) CCR Landfill Structural, Operational, and Safety Items

Noted Deficiencies

1. Storm water catch basin grades and/or soil settlement around catch basin inlets and flowline obstructions/uneven drainage grades on benches are allowing infiltration to occur instead of proper conveyance of storm water runoff from the pile.

Corrective Measures

1. A contractor has been retained to make necessary storm water catch basin inlet repairs.
2. Associated Engineers, Inc. will be retained to assist in developing measures to address, as soon as practicable, storm water catch basin grades and flowline obstructions/uneven drainage grades on benches that are allowing infiltration to occur instead of proper conveyance of storm water runoff from the pile.

(iv) CCR Landfill Changes

This is the first annual inspection report for the Green Station CCR landfill 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.



Flight Date: December 6, 2015

BIG RIVERS ELECTRIC

**SEBREE GENERATING STATION: GREEN STATION
CCR LANDFILL**

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



2740 North Main St. • Madisonville, KY 42431 | 1001 Frederica St. • Owensboro, KY 42301
 Phone: (270) 821-7732 • Fax: (270) 821-7789 | Phone: (270) 684-8450 • Fax: (270) 684-8449
www.associatedengineers.com

BREC Final Rule CCR Landfill Annual Inspection Checklist

Generating Station: Sebree					Weather: Partly cloudy
Landfill: Green Station					Temperature (Degrees F): 40 (average)
Date: December 2, 2015					Inspector/Qualified Person: Tim Brown & Matthew Lile (AEI)
ITEM		STATUS			OBSERVATIONS
		YES	NO	N/A	
1	CONDITION OF INACTIVE AREA				
	Access road deterioration (potholes, rutting, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Any erosion	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Surficial erosion/rills in cover material
	Longitudinal cracks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Transverse cracks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Visual depressions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minor ponding in bench flowlines; tracking/rutting from tractor & mower tires
	Visual settlement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Bulging or slumping	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Any drainage features obstructed or damaged	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Catch basin grades/soil settlement around basins & flowline obstructions
	Are drainage features flowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Is seepage present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Is seepage or discharge carrying sediment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Adequate vegetative cover	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Isolated bare areas & invasive species monocultures
	Are trees growing on the slope	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Are there any animal burrows	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sporadic animal borrows; primarily small to medium rodent/mammal
	Any stone deterioration	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Adequate riprap/slope protection	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Debris or trash present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Is there exposed CCR material	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Isolated areas
2	CONDITION OF ACTIVE AREA				
	Access road deterioration (potholes, rutting, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Any erosion	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Any cracks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Any slides	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Visual depressions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minimal depressions due to incomplete grading
	Visual settlement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

		STATUS			OBSERVATIONS
		YES	NO	N/A	
	Bulging or slumping	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Any drainage features obstructed or damaged	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Settlement around catch basins & incomplete grading
	Is seepage present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Is seepage or discharge carrying sediment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Debris or trash present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	LINER AND LEACHATE COLLECTION SYSTEM				
	Are liners intact and being installed correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Is the leachate collection operating correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Is the leachate collection pond/storage functioning correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Is there any slope/bank erosion on pond	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Are there any animal burrows on pond	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Is the spillway functioning and discharging correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4	RUN-ON/RUNOFF-CONTROLS				
	Are run-on/runoff controls in place	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Are run-on/runoff controls functioning	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Are run-on/runoff controls effective	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Are run-on runoff controls being maintained	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Signs of seepage or wetness	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Sediment transport or deposition	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
DEFICIENCIES AND MAINTENANCE ITEMS					
<p>1. Storm water catch basin grades and/or soil settlement around catch basin inlets and flowline obstructions/uneven drainage grades on benches are allowing infiltration to occur instead of proper conveyance of storm water runoff from the pile.</p>					

**Professional Engineer Certification [Per 40 CFR §257.84(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 257.84(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