



Green CCR Landfill

**Disposal of Coal Combustion Residuals (CCR) from Electric Utilities Final Rule
CCR Landfill 2022 Annual Inspection Report**

January 5, 2023

Prepared By:



Project ID: 22-0215

**Big Rivers Electric Corporation
Disposal of Coal Combustion Residuals (CCR) from Electric Utilities Final Rule
CCR Landfill 2022 Annual Inspection Report**

CCR Landfill Information

Name: Green 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 seventh 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. The 2022 inspection was concluded on November 3, 2022 by David A. Lamb P.E. of Associated Engineers, Inc. of Madisonville, Kentucky. Weekly (7-day) inspections conducted by Big Rivers Electric Corporation are kept in the facility operating record.

The inspection consisted of a visual assessment of the landfill and associated drainage control features; and began on the west side of the landfill adjacent to the vertical expansion combination wall (expansion wall). Evidence of minor seepage and slight ponding in a few isolated places along the toe of the wall approximately 1,450' north of the southwest end of the wall was observed. It appears this seepage was being managed by the subsurface drainage improvement along the toe of the wall. These improvements included the installation of a perforated subsurface pipe and trench filled with drainage medium to route the seepage underground to strategically placed pump stations surrounding the landfill. These subsurface drainage improvements were not only completed on the west side of the landfill but were installed throughout the entire perimeter except for a small section on the north end of the pile. In the areas where higher concentrations of moisture were previously present laterals and/or parallel subsurface draining structures were added to further reduce the presence and effects of seepage at the surface. At the time of the inspection virtually all the seepage from the landfill had been routed underground to the subsurface drainage system which flows to a series of pump stations. These pump stations are then pumped to the target manhole which is then pumped into the Green Ash Pond where it is treated and discharged with the remainder of the contact water. There was an area along the south toe which the subsurface drainage system was having maintenance activity performed. This area lacked vegetative cover due to the construction activities, but seeding and final grading of the surface is scheduled for the spring per BREC. The drainage ditch adjacent to the west access road that parallels the expansion wall and reports to Pond 012 at the south end of the landfill has been regraded and repurposed to primarily convey non-contact surface run off. As previously mentioned, this ditch is unvegetated in places due to prolonged periods of water in areas. It will be addressed as part of regular maintenance.

The inspection proceeded from the west side landfill to the inactive east side along the access road adjacent to the embankment toe. Proceeding north, the completion of the subsurface seepage collection system appears to have re-routed most if not all the seepage previously noted underground. The ditch along the east side of the landfill had recently been mowed and there was an area of minor settlement and erosion related to the underdrain system. This will be addressed as a part of routine maintenance now that it is visible. Along the lower bench at approximately the midpoint a small surficial slope failure of the cover material due to mower activity was noted. The inspection of the lower slope continued to the north side of the inactive landfill where there was an area of stressed vegetation along the northeast toe which appears to be caused by recent mowing and removal of phragmite. This vegetation is anticipated to recover in the next growing season.

After the inspection of the lower slope and toe the inspection proceeded to the first bench of the landfill on the west side which is comprised by the top of Poz-O-Tec fill placed against the expansion wall. The inspection then proceeded along the south, east, and north sides continuing bench by bench to the top of the landfill. The CCR fill material was firm and had been compacted in all permeant areas of placement. There were areas along the northeast and northwest side of the first bench in the active placement area where Poz-O-Tec had been placed in over steepened piles due to road grading and bench construction. These piles pose no significant threat to the overall structural integrity of the landfill. As inspection activities proceeded upward areas of minor to moderate erosion were noted. Particularly: The southeast inlet on the 3rd bench exhibited minor erosion around its perimeter. The west ditch on the 2nd bench exhibited minor erosion and had placed small quantities of CCR material atop the temporary cover. Lastly, the top bench exhibited minor erosion small quantities of CCR material atop the temporary cover at the northeast corner.

Inspection Report Specifications

(i) CCR Landfill Geometry

The Green CCR Landfill is used for the placement of coal combustion residual material, currently fly ash, bottom ash and related material. The landfill is raised above adjacent ground to a maximum elevation of approximately 608 feet above mean sea level. The original ground surface within the landfill footprint was irregular and the predominant features were small stream valleys draining towards the Green River which is located just east of the landfill; and towards Groves Creek which is located just south of the landfill.

Changes to the landfill geometry since the previous (2021) annual inspection include continued placement of CCR material behind the constructed vertical expansion wall on the west exterior slope; and the placement of additional CCR and cover material on the landfill.

(ii) CCR Landfill Volume

The total volume of CCR material contained in the Green CCR Landfill was estimated to be 23.4 million cubic yards. This volume was calculated from available baseline topography compared to August 2022 flight derived topographic contours.


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

No deficiencies or disrupting conditions that would require immediate measures to remedy were identified in the inspection. The inspection findings consisted of maintenance items that were not observed to be signs or potential signs of significant structural weakness.

(iv) CCR Landfill Changes

There have been no changes to the Green CCR Landfill since the previous 2021 annual inspection that have the potential to affect the stability or operation of the landfill. Changes include placement of additional CCR and cover material as well as the improvement and maintenance of the seepage collection system and Pond 012



 ASSOCIATED ENGINEERS, INC. ENGINEERS • GEOLOGISTS • SURVEYORS	BIG RIVERS ELECTRIC CORPORATION		Job Number: 22-0215	Revisions:
	Green CCR Landfill		Date: 01/05/2023	
	2022 Annual Inspection Aerial Photo		Scale: 1" = 250'	
			Drawn By: A.E.I.	
2740 North Main St. • Madisonville, KY 42431 Phone: (270) 821-7732 • Fax: (270) 821-7789 www.associatedengineers.com				

BREC Final Rule CCR Landfill 2022 Annual Inspection Checklist

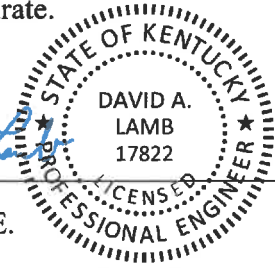
Operator: CCR Landfill: Date:	Sebree Generating Station Green November 03, 2022	Weather: Temperature (Degrees F): Inspector/Qualified Person:	Overcast 62 (high) David A. Lamb P.E.		
ITEM		STATUS			OBSERVATIONS
		YES	NO	N/A	
1 CONDITION OF INACTIVE AREA					
Access road deterioration (potholes, rutting, etc.)		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Any erosion		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Some 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"/>	Some low areas in bench flowlines and longitudinal tracking 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"/>	Some runoff ditches have minor erosion and contain sediment in areas
Are drainage features flowing		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is seepage present		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Seepage has primarily been routed and contained to the subsurface seepage collection system.
Is seepage or discharge carrying sediment		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Adequate vegetative cover		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Isolated bare areas and 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 burrows; primarily rodent
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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minor to moderate erosion on active disposal areas and haul roads
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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		STATUS			OBSERVATIONS

	YES	NO	N/A	
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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is seepage present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minor quantities along face of combination wall remainder is routed to the subsurface collection system.
Is seepage or discharge carrying sediment	<input type="checkbox"/>	<input checked="" 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are run-on/runoff controls functioning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are run-on/runoff controls effective	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are run-on runoff controls being maintained	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Signs of seepage or wetness	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sediment transport or deposition	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
DEFICIENCIES AND MAINTENANCE ITEMS				

No deficiencies or disrupting conditions that would require immediate measures to remedy were identified in the inspection. The inspection findings consisted of maintenance items that were not observed to be signs or potential signs of significant structural weakness.

**Professional Engineer Certification [Per 40 CFR §257.84(b)]
Green CCR Landfill
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

David A. Lamb P.E.

State of Kentucky License No. 17822

Date: January 5, 2023