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Green CCR Landfill

Disposal of Coal Combustion Residuals (CCR) from Electric Utilities Final Rule
CCR Landfill 2020 Annual Inspection Report

Big Rivers Electric Corporation

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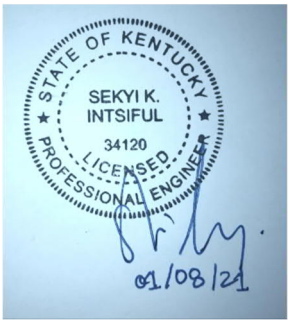

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1. Project Background

Per United States Environmental Protection Agency (USEPA) Final Coal Combustion Residual (CCR) Rule §257.84, annual inspection by a qualified professional engineer is required for each CCR unit. At the request of Big Rivers Electric Corporation (BREC), AECOM completed the annual inspection in accordance with the CCR Rule requirements and prepared this annual inspection report for the Green CCR Landfill at the Sebree Generating Station, located in Robards, at the boundary of Henderson County on the southeast and Webster County on the northeast, Kentucky.

The CCR Rule requires a visual inspection by a licensed professional engineer of each CCR unit to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. This inspection was performed in accordance with the scope of work presented in our proposal, dated July 23, 2020, executed under purchase order 260599 as part of general services agreement with BREC dated November 16, 2017.

2. Regulatory Requirements

The annual inspection criteria are specified in CCR Rule Section 257.84(b) (1) which at a minimum includes:

(i) 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 the previous annual inspections); and

(ii) A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit.

In addition to the annual inspections, 7-day inspection per CCR Rule Section 257.84 (a) are completed by BREC and are documented in the facility operating record.

Once the annual inspection has been completed, the CCR Rule Section 257.84(b) (2) requires the qualified professional engineer to prepare a report following each inspection that addresses the following:

(i) Any changes in geometry of the structure since the previous annual inspection;

(ii) The approximate volume of CCR contained in the unit at the time of the inspection;

(iii) 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

(iv) Any other change(s) which may have affected the stability of operation of the CCR unit since the previous annual inspection.

3. Review of Available Information

Prior to completing the visual inspection of the CCR unit, AECOM reviewed the 2019 Annual Inspection Report for the CCR unit, prepared by AECOM dated January 10, 2020. Any areas in need of repair were addressed by the report and BREC completed the appropriate repairs where necessary. The observations from the 2019 annual inspection completed by AECOM include:

- Lack of vegetation observed at the northeast corner on the uphill slope of top berm, on the fifth berm from top on the west to southwest area, and on the top portion near northeast corner of the seventh berm,

- Slight erosion observed in the northeast corner of the seventh berm from the top, and
- Rutting and erosion observed near the drain on the second berm from the top on the northeast side.

The 2019 inspection concluded “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.”

After the inspection observations were made available to BREC, maintenance measures were completed at the Green CCR Landfill to ensure the 2019 observations were addressed. Actions taken by BREC to address previous inspections observations include regrading or erosion and rutted areas and reseeding the areas of sparse vegetation during the fall when the weather conditions were conducive to vegetative growth.

These observations were repaired as soon as practical based on the mowing schedule and weather. Removing sediment buildup, filling low areas, and reseeding activities were to be completed when such repair activities don’t exacerbate any required maintenance.

In summary, no deficiencies were identified, and the previously stated observations were addressed prior to submittal of this report.

4. Inspection Procedures & Observations

Per CCR Rule Section 257.84 (b) (3) the owner or operator of the CCR unit (BREC) must complete the initial inspection no later than January 18, 2016. This report summarizes the sixth annual inspection performed by BREC since the final CCR Rule took effect October 14, 2015. The inspection was completed on August 18, 2020 and was completed by AECOM professional engineers Mark Keown, P.E. and Sekyi Intsiful, P.E. In addition to the annual inspection, BREC completes 7-day inspections of the CCR unit in accordance with Section 257.84 of the CCR Rule.

The inspection consisted of visual assessment of the landfill and associated protective cover soil, vegetation, and storm water management structures. The inspection began on the west side along the Mechanically Stabilized Poz-O-Tec (MSP) wall moving from north to south at the toe of the wall. The riprap check dams and erosion control matting were in good condition along the toe of the wall.

The inspection progressed to the south end of the landfill at the toe of the landfill moving to the east. Generally, this toe along the south appeared to be in good condition functioning as designed. Inspection continued to the east side of the landfill along the toe of the slope, where there were signs of rutting from equipment use in the area, free flowing water or seepage, and sloughing on the northeast side of the landfill. In response, a perimeter drainage control project was initiated to capture and route the free flowing water and seepage, which currently discharges to a permitted KPDES Outfall.

After inspecting the toe of the south and east sides of the landfill, the inspection proceeded to the first bench on the west, east and south sides of the landfill working up to the top of the landfill. Generally, the vegetation; surface water controls; and protective cover within the area appeared to be in good condition. However, erosion was observed in the following areas in the southwestern portion of the landfill: around the manhole on the first berm; at the toe of the slope below second berm; erosion and material deposition on third berm; and erosion on fourth berm with some areas more than a foot deep. Following the inspection BREC filled any voids, regraded, reseeded, and laid straw at the affected areas.

Excessive vegetation was observed at the crest of the landfill on the east side. Lack of vegetation was observed on the south side of second berm, lack of vegetation and erosion on the slope uphill of fourth berm and on west and mid-section of landfill, and sparse vegetation on fourth bench uphill slope on west of landfill. As part of the regular Green CCR Landfill maintenance, BREC reseeded areas of sparse vegetation during the fall when the weather conditions were conducive to vegetative growth.

The north side and top and bottom portions of the west side of the landfill are active. Generally, these areas appeared to be in good condition at the time of the inspection, except at the second berm downhill slope, where the vegetated slope was partially undercut and slightly overhanging due to erosion and separation from the active phase CCR materials.

The inspection was limited to the portions of the landfill that had protective cover soils placed and were not part of the working face of the landfill. The working face of the landfill is maintained by BREC operations.

5. Inspection Findings

Per CCR Rule Section 257.84(b) (2) the following observations were made.

5.1 CCR Landfill Geometry

The Green CCR Landfill is used for the placement of coal combustion residual (CCR) material including primarily Poz-O-Tec and related materials. The landfill has a maximum elevation of approximately 608 feet above mean sea level (ft. AMSL), based on aerial photogrammetry conducted by Associated Engineers in September 2020. The Green River lies to the east and Groves Creek lies to the south of the landfill. The landfill has approximately 7 continuous benches on the south and east side, each higher in elevation until the top of landfill is reached. The north side and top and bottom portions of the west side of the landfill are receiving CCR placement as part of BREC operations. An aerial photograph of the Green CCR Landfill is presented in Figure 1.

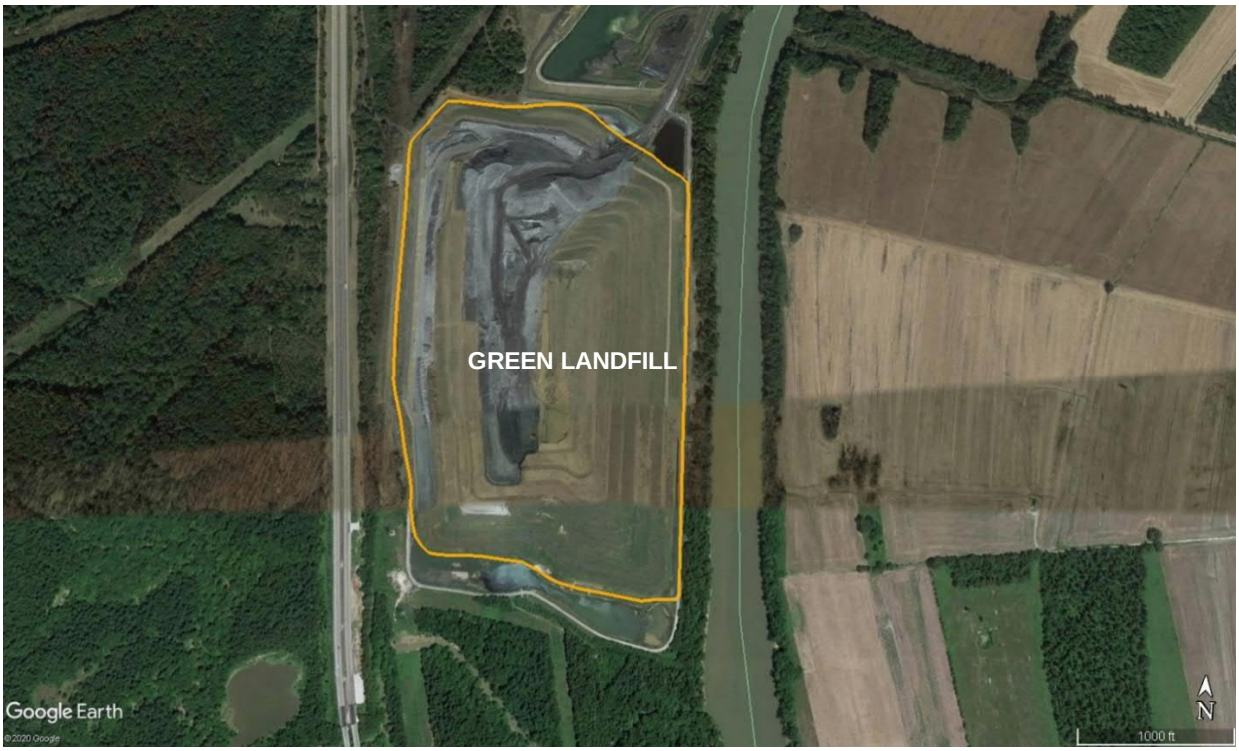

Figure 1: Big Rivers Green Landfill Overview (Google Earth, 2020)

Changes to the landfill geometry since the previous 2019 annual inspection includes placement of additional CCR, protective cover soils and establishing vegetation on the landfill.

5.2 CCR Landfill Volume

The total volume of CCR material contained in the Green CCR Landfill was estimated to be approximately 22.8 million cubic yards, based on aerial photogrammetry conducted by Associated Engineers in September 2020.

5.3 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.

The observations were limited to sparse and excessive vegetation, and rutting; seepage; and sloughing at the toe of slope on the northeast side of the landfill. BREC has been made aware and had rectified the aforementioned observations at the writing of this report.

5.4 CCR Landfill Changes

There have been no changes to the Green CCR Landfill since the previous 2019 annual inspection that may have the potential to affect the stability or operation of the CCR unit. Changes include typical operations activity such as placement of additional CCR material and protective cover soil to meet the closure design grades of the landfill. The MSP wall is being constructed as designed and showed no signs of instability at the time of the inspection.

6. Recommendations – General Maintenance and Monitoring Conditions

Overall

1. Continue regular mowing of all berms with vegetation control to prevent the growth of excessive woody plants and brushes.
2. Continue regular maintenance of minor erosion rills and rutting in timely manner.
3. Continue weekly inspection as required by the CCR mandated roles and submit Inspection Reports to the facility operating record in a timely manner.

Active Areas

1. Continue current maintenance practices.

Closed Areas

1. Continue current maintenance practices.
2. Continue to complete seasonal repairs such as reseeding areas of sparse vegetation and filling in ruts caused by the tractor and mowing operations.
3. Continue to check catch basins for obstructions and clear as needed.