Closure Plan
Jeffrey Energy Center
Bottom Ash Settling Area

Revision 0 - October 2016

Revision 1 - April 2021

Revision 2 - April 2026

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Plan Review/Amendment Log §257.102(b)(3)

Date of Review	Reviewer	Sections Amended
October 13, 2016	APTIM Environmental & Infrastructure, LLC	Original Draft
April 2021	Evergy, Inc	Revised company name, corrected CCR unit name, removed regulatory requirements cross-reference table, removed figures, updated maximum volume, separated the plan for closure of this unit separately from the Bottom Ash Landfill, revised for closure by removal & to be closer in alignment with other Evergy closure plans.
April 2026	Evergy, Inc	Revised closure process to reflect closure by consolidation that was completed within the Bottom Ash Settling Area

1.0 INTRODUCTION

Evergy, Inc. (Evergy) has revised the following Closure Plan (Plan) for the Bottom Ash Settling Area (BASA) located at the Jeffrey Energy Center (JEC) in St. Mary's, Kansas. JEC is a coal-fired generating station. The BASA has been deemed to be a regulated coal combustion residual unit under the United States Environmental Protection Agency (USEPA) Disposal of Coal Combustion Residuals from Electric utilities Final Rule (CCR Rule) 40 CFR §257 and §261.

This Plan details the closure requirements outlined in §257.102(b) for CCR units closed by consolidation of CCR. It includes closure criteria for closure in place and closure by removal. The criteria for conducting the closure or retrofit of CCR units for the BASA are detailed in Section 2.0. Additionally, the following Plan details the necessary steps to close the BASA at any point in during the active life, based on recognized and good engineering practices.

2.0 REGULATORY OVERVIEW OF CCR CLOSURE PLAN REQUIREMENTS

On April 17, 2015, USEPA published the CCR Rule under Subtitle D of the Resource Conservation and Recovery Act (RCRA) as 40 CFR Part §257 and §261. The purpose of the CCR Rule is to regulate the management of CCR in regulated CCR units for landfill and surface impoundments. The BASA has been deemed to be a regulated CCR unit at JEC.

Section 257.102(b) of the CCR Rule requires owners or operators of CCR landfills and surface impoundments to prepare a Plan describing the closure of the unit and schedule for implementation of the Plan. The following citations from the CCR Rule are applicable for the BASA as discussed in this Plan:

§257.102(b)(1) stipulates:

(b) Written closure plan – (1) Content of the plan. The owner or operator of a CCR unit must prepare a written closure plan that describes the steps necessary to close the CCR unit at any point during the active life of the CCR unit consistent with recognized and generally accepted good engineering practices. The written closure plan must include, at a minimum, the information specified in paragraphs (b)(1)(i) through (vi) of this section

- *(i) A narrative description that discusses how the CCR unit will be closed in accordance with this section.* (See Section 4.1)
- *(ii) If closure of the CCR unit will be accomplished through removal of CCR from the CCR unit, a description of the procedures to remove the CCR and decontaminate the CCR unit in accordance with paragraph (c) of this section.* (See Section 4.1)
- *(iii) If closure of the CCR unit will be accomplished by leaving CCR in place, a description of the final cover system, designed and methods and procedures to be used to install the final cover will achieve performance standards specified in paragraph (d) of this section, and the methods and procedures to be used to install the final cover. The closure plan must also discuss how the final cover system achieves the performance standards specified in paragraph (d) of this section.* (See Section 4 and Section 5)
- *(iv) An estimate of the maximum inventory of CCR ever on-site over the active life of the CCR unit.* (See Section 3.4)
- *(v) An estimate of the largest area of the CCR unit ever requiring a final cover as required by paragraph (d) of this section at any time during the CCR unit's active life.* (See Section 3.5)
- *(vi) A schedule for completing all activities necessary to satisfy the closure criteria in this section, including an estimate of the year in which all closure activities for the CCR unit will be completed. The schedule should provide sufficient information to describe the sequential steps that will be taken to close the CCR unit, including identification of major milestones such as coordinating with and obtaining necessary approvals and permits from other agencies, the dewatering and stabilization phases of CCR surface impoundment closure, or installation of the final cover system, and the estimated timeframes to complete each step or phase of CCR unit closure. When preparing the written closure plan, if the owner or operator of a CCR unit estimates that the time required to complete closure will exceed the timeframes specified in paragraph (f)(1) of this section, the written closure plan must include the site-specific information, factors and considerations that would support any time extension sought under paragraph (f)(2) of this section.* (See Section 6.0)

An outline of the closure performance standards for closure of units where CCR will be

removed is described in §257.102(c), which stipulates:

"An owner or operator may elect to close a CCR unit by removing and decontaminating all areas affected by releases from the CCR unit. CCR removal and decontamination of the CCR unit are complete when constituent concentrations throughout the CCR unit and any areas affected by releases from the CCR unit have be removed and groundwater monitoring concentrations do not exceed the groundwater protection standard established pursuant to §257.95(h) for constituents listed in appendix IV to this part."

In accordance with §257.102(b)(4), a written certification is provided in Section 7.0 from a qualified professional engineer in the State of Kansas, to certify that this Plan meets the requirements of the CCR Rule.

3.0 JEC BASA OVERVIEW

3.1 Location, Topography, and Description

Bottom ash slurry was historically deposited within JEC's BASA. The closure of the BASA will be accomplished by the consolidation of CCR within the unit. All removed CCR will be disposed within an active CCR Unit. All CCR remaining in place will be appropriately capped and covered. The following Plan was developed to satisfy the CCR Rule requirements for closure in place and closure by removal per §257.102.

The BASA is located within JEC ½ mile west of the plant and ¾ miles east of Tower Hill Lake. The total surface area of the impoundment is less than 20 acres.

There are no available drawings, construction records, or written operational records of the original construction. However, in the original construction a berm was constructed on the downstream west side of the unit creating a depression that was subsequently allowed to fill with bottom ash. As the depression became full, the containment berm was increased in height to increase available storage.

The topography varies across the Bottom Ash Area ranging in elevations from 1,226 to 1,299 feet, mean sea level (ft MSL).

3.2 Existing Solid Waste Regulatory Permits and Consents

Evergy was granted an Industrial Landfill Permit at JEC by the Kansas Department of Health and Environment – Bureau of Waste Management (KDHE-BWM) for the BASA through Industrial Landfill Permit No. 0359, in accordance with Kansas Statutes Annotated (KSA) 65-3407. KDHE modified the solid waste permit, per K.A.R. 28-29-6a, in response to the CCR Rule to include CCR material handling areas where fugitive dust control was required. The current Industrial Landfill Permit modification was approved on October 15, 2015. This allows CCR material generated on-site at JEC to be properly treated and/or disposed of within the Industrial Landfill Permit boundary, including the BASA.

3.3 Bottom Ash Generation, Recycling, and Disposal

Bottom ash is generated at JEC as historically collected in a hopper and gravity sluiced, in a water slurry to the BASA. The bottom ash was allowed to settle out and dry in the BASA prior to transport to the adjacent Bottom Ash Area Landfill. Bottom ash was segregated at the Bottom

Ash Area Landfill for recycling efforts and either used for resale to the construction industry or disposed of at the Bottom Ash Area Landfill. JEC stopped sluicing bottom ash after April 11, 2021.

3.4 Maximum Volume Estimate (§257.102(b)(1)(iv))

The maximum volume ever on site is unknown, however, Evergy expects the maximum amount of CCR in the unit would not have exceeded the unit capacity, which was estimated by Aptim in 2021 to be approximately 534,000 cubic yards (cy).

3.5 Largest Area Requiring Final Cover (§257.102(b)(1)(v))

The Bottom Ash Area has been designed, and will be operated so that contemporaneous operation and closure occur. The final cover will be constructed in stages to facilitate JEC operational requirements. The largest area requiring final cover at any time during the CCR unit's operating period is estimated to be the current operational area of the Bottom Ash Settling Area, which is approximately 52.5 acres in size.

4.0 CLOSURE PLAN (§257.102(b))

This Plan has been prepared in accordance with requirements of the CCR Rule and includes a written certification in Section 8.0 from a qualified Professional Engineer for the State of Kansas.

4.1 Narrative Description (§257.102(b)(1)(i))

Closure will be accomplished through consolidation of CCR. The CCR material contained in the unit will be dewatered as necessary, removed, and either beneficially used or disposed in an on-site CCR landfill. A small component of CCR will remain in place within an outer berm, which comprises the perimeter road of the Bottom Ash Landfill. CCR will be removed by mechanical excavation using earth-moving equipment. CCR will be allowed to dewater by gravity drainage and evaporation. Where CCR is left in place a final cover will be constructed. As part of CCR removal and final cover construction, stormwater controls will be installed to manage flow from the BASA, which will also be regraded for surface water drainage; and the area will be seeded, vegetated, and/or re-surfaced as appropriate for surface water and erosion control.

The method of closure has been designed to minimize maintenance, leachate generation, control run-on and run-off, and ensure the protection of human health and the environment. Closure of the Bottom Ash Area will follow Construction Quality Assurance (CQA) procedures to ensure the final cover over CCR remaining in place is designed, constructed, and installed in accordance with recognized standards and accepted good engineering practices as detailed in the following sections.

4.2 Final Cover and Subgrade Overview (§257.102(b)(1)(iii) and §257.102(d)(3)(i))

The final cover has been designed to meet the following objectives:

- Minimize the potential post-closure infiltration of liquids into the waste;
- Minimize the potential for releases of CCR material, leachate, or contaminated runoff to

the ground or surface waters or the atmosphere;

- Provide long-term slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure period; and

- Minimize the need for further maintenance of the CCR unit.

The final cover will be installed on top of a subgrade layer of compacted and graded bottom ash. The Bottom Ash Area perimeter berm slope will be constructed to allow for adequate drainage of run-off. Positive drainage will minimize the potential for infiltration of liquids into the CCR unit. The final cover of the Bottom Ash Area will be constructed when final grades have been achieved and will be comprised of the following layers, from bottom to top:

- A minimum 18-inch compacted soil (or) 40-mil Liner Low Density Polyethylene (LLDPE) geomembrane (or equivalent), infiltration layer; and

- A minimum 6-inch vegetated, erosion control layer.

The final cover system will meet the requirements of §257.102(d)(3)(i) and have a minimum permeability of $1x10^{-5}$ cm/sec. An alternate final cover may be used in lieu of the final cover system described above and will follow §257.102(d)(3)(ii). If an alternate liner system is considered, the KDHE will be notified, and appropriate permitting will be secured.

4.3 Low Permeability Subgrade Construction

Prior to construction of the final cover, a 12-inch subgrade area comprised of bottom ash will be prepared and used to support the final cover system. The subgrade will be compacted, then graded, and smoothed to ensure a uniform surface.

After the grading and compaction of the subgrade, the area will be inspected to ensure the working surface is smooth and free from sharp objects or abrupt changes in grade, and proper sloping allowed for drainage.

4.4 Infiltration Layer

An 18-inch compacted soil layer or a 40-mil textured LLDPE geomembrane (or equivalent) may be installed at the Landfill to serve as the infiltration layer. This layer will prevent infiltration of moisture through the final cover into the CCR material.

If the geomembrane is used, installation will follow the best practice procedures and in accordance with third-party conformance testing. Third-party conformance testing will be conducted on key parameters for the geomembrane material properties. Testing will be reported as part of the Construction Quality Assurance (CQA) for the Bottom Ash Settling Area.

4.5 Erosion Control Layer

The erosion control layer will include 6-inches of natural soils capable of sustaining vegetation. After placement, the soil will be seeded to promote the establishment of a healthy stand of grass and native vegetation. The vegetation will assist in limiting the infiltration of

surface waters and effects of erosion on the final cover system.

The thickness of the infiltration and erosion control soils will be verified by surveying the top of the layer in the same locations completed on the top of subgrade. The specified thickness of the layers are minimum thicknesses that will be developed in the field.

4.6 Stormwater Run-On and Run-Off Controls

Within the footprint of the area which will be closed by removal, a central drainage channel will be constructed to prevent ponding and promote movement of stormwater through the Bottom Ash Settling Area. This channel will also collect non-contact stormwater from the capped areas that are closed in place within the perimeter berm. All stormwater features will have been designed and constructed to convey run-on/run-off from a 25-year, 24-hour storm event.

Once the final cover installation/closure of the Bottom Ash Area is completed, non-contact stormwater run-off from the Bottom Ash Area will drain to Tower Hill Lake, via gravity flow. Tower Hill Lake discharges into a tributary of the Kansas River. The outfall location at Tower Hill Lake is monitored to ensure that effluent limits meet the standards set by the NPDES Permit No. IKS67-PO06 and 40 CFR Part §257.81(b).

4.7 Operations and Maintenance

Following closure, the final cover will be maintained to prevent erosion and control excessive vegetative growth. Maintenance of the final cover will include periodic mowing of the vegetative cover and reseeding as necessary. The grass will be maintained at such a level as to facilitate inspection. This will help to discourage the inhabitance of burrowing animals. Mowing activities will be conducted on an as-needed basis. The erosion control layer on the final cover system will be inspected, filled with soil, and regraded if the erosion channels are approximately 6-inches deep. Further details on the operations and maintenance are provided in the Post-Closure Plan for the Bottom Ash Settling Area.

5.0 CLOSURE PERFORMANCE STANDARDS (§257.102(d)(1))

5.1 Minimization of Liquid Infiltration into CCR Material Mass (§257.102(d)(1)(i))

As detailed above, the final cover system for areas closed in place within the Bottom Ash Settling Area will include an infiltration layer, consisting of either compacted soils and/or a low-permeability geomembrane layer, and an erosion control layer. The compacted soils and/or geomembrane will help to minimize the potential infiltration of water to the CCR material. The final cover system will assist in preventing the contact between the surface water and the CCR material. This will minimize the movement of potentially contaminated water to ground or surface water systems. Additionally, it will assist in controlling, minimizing and in some cases eliminating, to the maximum extent feasible, post-closure infiltration of liquids into the waste, and the potential release of CCR material and leachate, as required by the performance standards.

5.2 Preclusion of Future Impoundment of Water, Sediment, or Slurry (§257.102(d)(1)(ii))

Final grades for the closed BASA will promote good surface water drainage away from the unit. Nor does Evergy anticipate the need for future impoundment of water, sediment, or slurry within the Bottom Ash Area once consolidation has been completed. Thus satisfying this performance standard.

5.3 Measures to Maintain Slope Stability (§257.102(d)(1)(iii))

To maintain slope stability of the final cover, run-off is collected and controlled in highly erodible areas, such as the side slopes and top slope. The run-off controls prevent erosion, movement, and sloughing of the final cover system, as required by the performance standard.

5.4 Design to Minimize Ongoing Maintenance (§257.102(d)(1)(iv))

Stormwater controls will be installed to manage flows from the BASA, along with the development of final grades that accommodate positive surface water drainage. The area will be seeded, vegetated or re-surfaced as appropriate for surface water and erosion control. This will reduce the need for on-going maintenance of the Bottom Ash Settling Area. Weekly inspections will assist in identifying maintenance needed at the earliest opportunity, to prevent larger maintenance requirements in the future. These measures will fulfil the required performance standard.

5.5 Good Engineering Practices (§257.102(d)(1)(v))

The planned timely completion and phasing of final cover operations, and removal of the majority of CCR Material will prevent large amounts of contact water from being generated. These good engineering practices will satisfy this performance standard.

6.0 CLOSURE ACTIVITY SCHEDULE (§257.102(b)(1)(vi))

The size of area and time of year closure construction takes place will vary; therefore closure construction schedules will vary. The schedule provided in this section is therefore a general estimation.

6.1 Commencement of Closure

Commencement of final closure has occurred if placement of waste in the BASA has ceased and any of the following actions or activities has been completed (40 CFR 257.102(e)(3)):

6.1.1 Steps necessary to implement this Plan;

6.1.2 Submittal of a completed application for any required state or agency permit or permit modification; or

6.1.3 Steps necessary to comply with any state or other agency standards that are a prerequisite, or are otherwise applicable, to initiating or completing the closure.

6.2 Closure Schedule

The milestones and the associated timeframes in this section are initial estimates. Some of the activities associated with the milestones will overlap.

Table 1: Estimated Closure Schedule

Original Written Closure Plan	April 2021
Notification of Intent to Close Placed in Operating Record	April 11, 2021
Initiation of Closure / Coordinating with and obtaining necessary approvals and permits from other agencies	Year 1-2
Mobilization	Year 1
Dewater and remove CCR; Complete installation of final cover system on surrounding road berm	Year 1 - 3
Year all closure activities for the CCR unit will be completed	Year 1-5 [1]
Notes: Final closure of Surface Impoundments must be completed within five years of commencing closure unless a demonstration is placed in the operating record (40 CFR 257.102(f)(2)).	

7.0 AMENDMENT OF CCR CLOSURE PLAN (§257.102(b)(1))

The owner or operator may amend the initial or any subsequent written Plan developed pursuant to 40 CFR 257.102(b)(1) at any time.

The written closure will be amended at least 60 days prior to a planned change in the operation of the facility or CCR unit, or no later than 60 days after an unanticipated event requires the need to revise an existing written Plan. If a written Plan is revised after closure activities have commenced for a CCR unit, the current written Plan will be amended no later than 30 days after the triggering event.

A written certification from a qualified professional engineer that the initial and any amendment of the written Plan meets the requirements of §257.102(b) must be obtained.

Plan changes will be documented using the Revision History which prefaces this Plan. Changes to this Plan will be certified by a Qualified Professional Engineer.

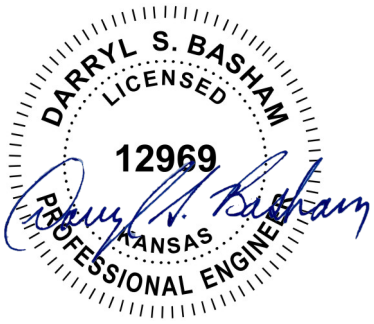
8.0 PROFESSIONAL ENGINEER CERTIFICATION (§257.102(b)(4))

The undersigned registered professional engineer is familiar with the CCR Rule requirements of §257.102 of the CCR Rule and has visited and examined JEC or has supervised examination of JEC by appropriately qualified personnel. The undersigned registered professional engineer attests that this CCR Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and meets the requirements of §257.102, and that this Plan is adequate for JEC's facility. This certification was prepared as required by §257.102(b)(4).

Name of Professional Engineer: Darryl Basham P.E.

Company: Evergy

Professional Engineer Seal:



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