



Sebree Generating Station

Reid/HMP&L CCR Surface Impoundment Closure Plan

Revision 2

July 24, 2023

Issue Purpose: Use

Project No.: 14055-010

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Chicago, IL 60603-5780 USA
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CLOSURE PLAN REVISION HISTORY

Rev.	Purpose of Issue	Date	By Whom	Summary of Revisions
0	Initial Issue	10/11/2016	Associated Engineers, Inc.	N/A
1	Use	07/14/2023	Sargent & Lundy	Updated closure method to closure by removal.
2	Use	07/24/2023	Sargent & Lundy	Added additional inspection and reporting requirements for closure certification.

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FIGURES

Figure 1 – General Site Location Map

Figure 2 – Site Map with Monitoring Well Locations

1.0 PURPOSE & SCOPE

Federal CCR Rule Reference: 40 CFR 257.102(b)

Kentucky Administrative Regulations Reference: 401 KAR 46:110 Section 9

Reid/HMP&L CCR Surface Impoundment at Big Rivers Electric Corporation's (BREC) Sebree Generating Station is an existing coal combustion residual (CCR) surface impoundment that is regulated by the U.S. Environmental Protection Agency's (EPA) "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments." These regulations are codified in 40 CFR Part 257 Subpart D (Ref. 1) and are also referred to herein as the "Federal CCR Rule." The Reid/HMP&L CCR Surface Impoundment is also regulated under Title 401, Chapter 46 of the Kentucky Administrative Regulations (KAR) (Ref. 2), which incorporates the Federal CCR Rule by reference.

Pursuant to 40 CFR 257.102(b) and 401 KAR 46:110 Section 9, this document provides the written closure plan for the Reid/HMP&L CCR Surface Impoundment at the Sebree Generating Station. BREC intends to close this CCR surface impoundment by removing CCR remaining in the pond pursuant to 40 CFR 257.102(c) and 401 KAR 46:110 Section 9. This plan describes the steps necessary to close the Reid/HMP&L CCR Surface Impoundment in this manner.

2.0 SITE BACKGROUND

2.1 SEBREE GENERATING STATION

BREC operates the Sebree Generating Station located on the Green River northeast of Sebree, Kentucky (see Figure 1) with Interstate 69 located to the west. Three former coal-fired power plants are co-located at the Sebree Generating Station: the Robert D. Green Station, the Robert A. Reid Station ("Reid"), and Henderson Municipal Power & Light (HMP&L) Station Two. Reid Unit 1 began commercial operation in 1966 and was retired on September 30, 2020. HMP&L Station Two Units 1 and 2 began commercial operation in 1973 and 1974, respectively; both units were retired as of February 1, 2019. Green Station Units 1 and 2 began commercial operation in 1979 and 1981, respectively, and were converted to natural gas fuel in 2022.

2.2 REID/HMP&L CCR SURFACE IMPOUNDMENT

2.2.1 LOCATION & DESCRIPTION

The location of the Reid/HMP&L CCR Surface Impoundment is shown on Figure 2. The surface impoundment has been in place for more than 40 years but is no longer used. Prior to being taken out of service in 2019, the Reid/HMP&L CCR Surface Impoundment was used to manage ash sluice water from the Reid Station and HMP&L Station Two. The Reid/HMP&L CCR Surface Impoundment's is a partially diked and partially incised impoundment with a total approximate storage area of 23.3 acres. The surface

impoundment is diked on the west, south, and east sides and is incised on the north side. The west dike has the greatest height, reaching approximately 35 feet.

2.2.2 INVENTORIES OF WATER & CCR

Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(iv)

Kentucky Administrative Regulations Reference: 401 KAR 46:110 Section 9

Based on a survey performed in May 2022, the depth of water remaining in the Reid/HMP&L CCR Surface Impoundment is approximately 14 feet. Based on the May 2022 survey, the original construction records for the pond, and soil boring data, approximately 822,000 cubic yards of CCR are currently stored in the Reid/HMP&L CCR Surface Impoundment. This is considered to be the maximum inventory of CCR ever on-site over the active life of the surface impoundment.

3.0 CLOSURE PLAN NARRATIVE SUMMARY

Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(i) & 257.102(c)

Kentucky Administrative Regulations Reference: 401 KAR 46:110 Section 9

BREC plans to close the Reid/HMP&L CCR Surface Impoundment by removing CCR from the pond pursuant to 40 CFR 257.102(c) and 401 KAR 46:110 Section 9. The Reid/HMP&L CCR Surface Impoundment closure will be executed according to the following sequential steps:

1. Removing influent pipes and pipe support structures within the pond limits.
2. Decontaminating and removing riprap from the pond's interior slopes.
3. Clearing, grubbing, and/or stripping vegetation within the pond limits.
4. Drawing down free surface water in the pond and dewatering the CCR stored therein.
5. Excavating CCR from the surface impoundment to native subsoils.
6. Hauling excavated CCR and CCR-impacted soils to the Green Station CCR Landfill for final disposal.

4.0 CCR REMOVAL & DECONTAMINATION PROCEDURES

Federal CCR Rule References: 40 CFR 257.102(b)(1)(ii) & 257.102(c)

Kentucky Administrative Regulations Reference: 401 KAR 46:110 Section 9

Prior to removing CCR from the pond, the free surface water remaining in the Reid/HMP&L CCR Surface Impoundment will be drawn down and the impounded CCR will be dewatered. Dewatering methods will be determined by the General Contractor awarded the contract for closing the impoundment. Potential dewatering methods include but are not limited to installing well-points, excavating trenches, *etc.* All water removed from the Reid/HMP&L CCR Surface Impoundment during closure will be discharged through the

surface impoundment's existing outlet structure (regulated Outfall 004) in accordance with the effluent limitations for Outfalls 001 and 004 in the Station's Kentucky Pollutant Discharge Elimination System (KPDES) permit.

As free surface water in the pond is drawn down, impounded CCR will be dewatered and subsequently excavated from the Reid/HMP&L CCR Surface Impoundment. CCR will be excavated down to the native subsoils under the pond. Upon reaching the pond floor, the Certifying Engineer, an independent, third-party professional engineer licensed in the Commonwealth of Kentucky pursuant to Kentucky Revised Statutes (KRS) Chapter 322, will visually inspect the native subsoils to verify all CCR constituents have been removed in accordance with 40 CFR 257.102(c) and 401 KAR 46:110 Section 9. Native subsoils determined to be impacted by CCR constituents ("CCR-impacted soils") during visual inspection will be removed from the Reid/HMP&L CCR Surface Impoundment. All excavated CCR and CCR-impacted soils will be loaded onto trucks and hauled to the Green Station CCR Landfill for final disposal.

Following the removal of all CCR from the Reid/HMP&L CCR Surface Impoundment, the Kentucky Division of Waste Management (DWM) will be contacted for a final inspection to be conducted. The Certifying Engineer and representatives from Kentucky DWM will then visually inspect the area to verify that CCR constituents have been removed from the impoundment. Following this final inspection, a Clean Closure Construction Progress Report (CPR) documenting clean all closure activities will be prepared and submitted to Kentucky DWM for review and acceptance. The Clean Closure CPR will be certified by the Certifying Engineer, who will be a professional engineer licensed in the Commonwealth of Kentucky pursuant to KRS Chapter 322.

5.0 CLOSURE SCHEDULE

Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(vi)

Kentucky Administrative Regulations Reference: 401 KAR 46:110 Section 9

Closure activities for the Reid/HMP&L CCR Surface Impoundment are expected to be completed by March 31, 2024. Table 1 lists the major milestones necessary for closing the pond and the expected duration for completing each milestone.

Table 1 – Planning Level Schedule for Closing Reid/HMP&L CCR Surface Impoundment

Milestone	Start Date	End Date
General Contractor Mobilization	July 2023	July 2023
Removal of Influent Piping and Vegetation	July 2023	August 2023
Pond Dewatering	July 2023	March 2024
CCR Removal	August 2023	March 2024
Closure Completion	March 31, 2024	March 31, 2024

6.0 AMENDMENTS TO CLOSURE PLAN

Federal CCR Rule Reference: 40 CFR 257.102(b)(3)

Kentucky Administrative Regulations Reference: 401 KAR 46:110 Section 9

This closure plan will be amended in accordance with 40 CFR 257.102(b)(3) and 401 KAR 46:110 Section 9 if a change in the operation of the Reid/HMP&L CCR Surface Impoundment would substantially affect this closure plan or if an unanticipated event necessitates a revision to this closure plan. Any and all amendments to this closure plan will be certified by a qualified professional engineer registered in the Commonwealth of Kentucky in accordance with 40 CFR 257.102(b)(4) and 401 KAR 46:110 Section 9.

7.0 CERTIFICATION

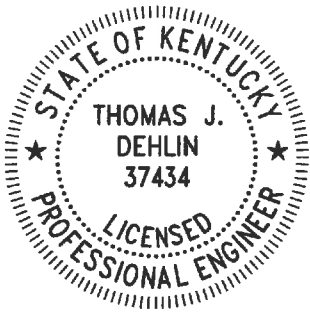
I certify that this amendment to this closure plan for the Reid/HMP&L CCR Surface Impoundment meets the requirements for a written closure plan pursuant to 40 CFR 257.102(b.) and 401 KAR 46:110 Section 9.

I certify that this document was prepared by me or under my direct supervision and that I am a registered professional engineer under the laws of the Commonwealth of Kentucky.

Certified By: Thomas J. Dehlin, P.E.

Date: July 24, 2023

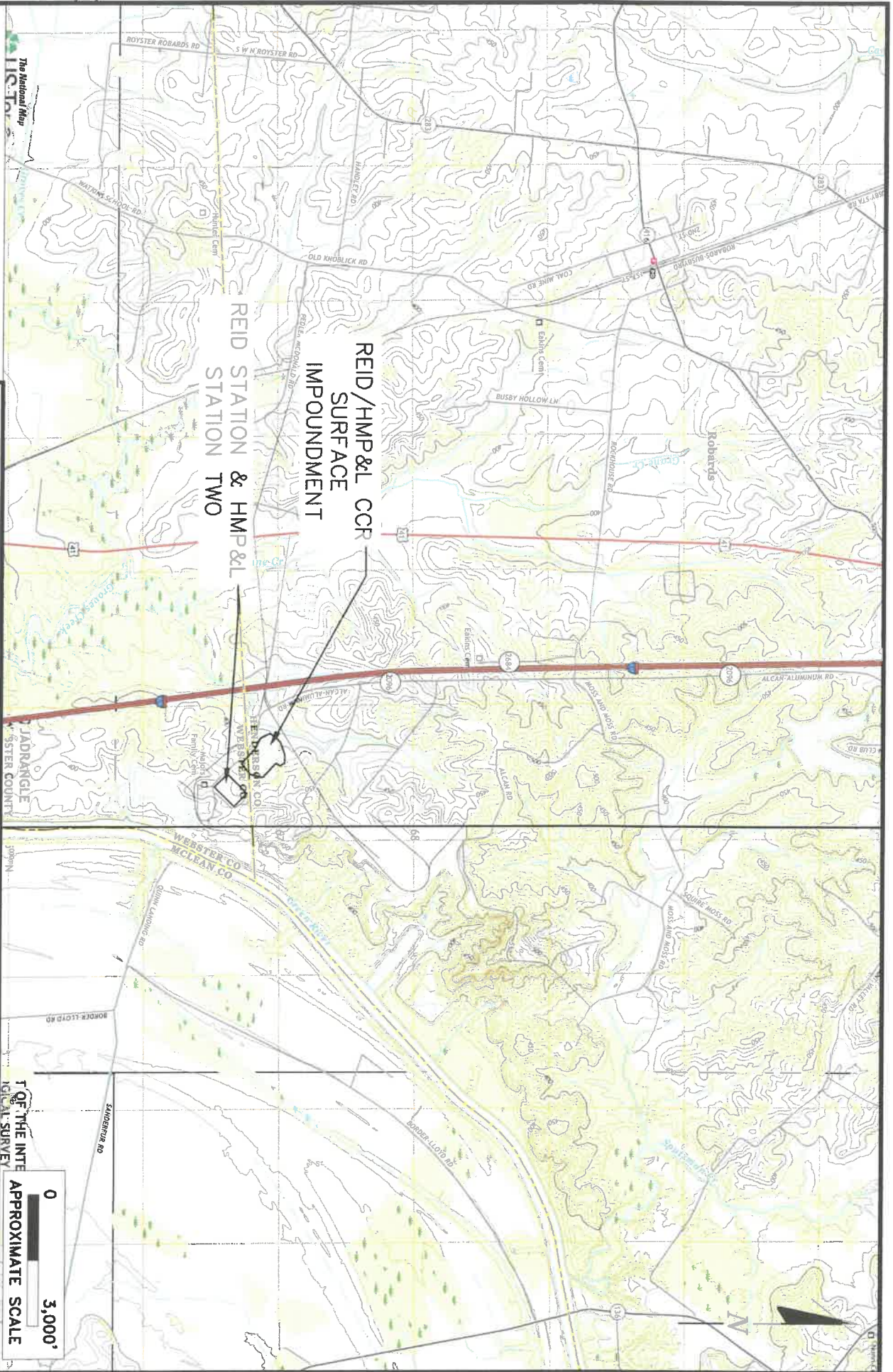
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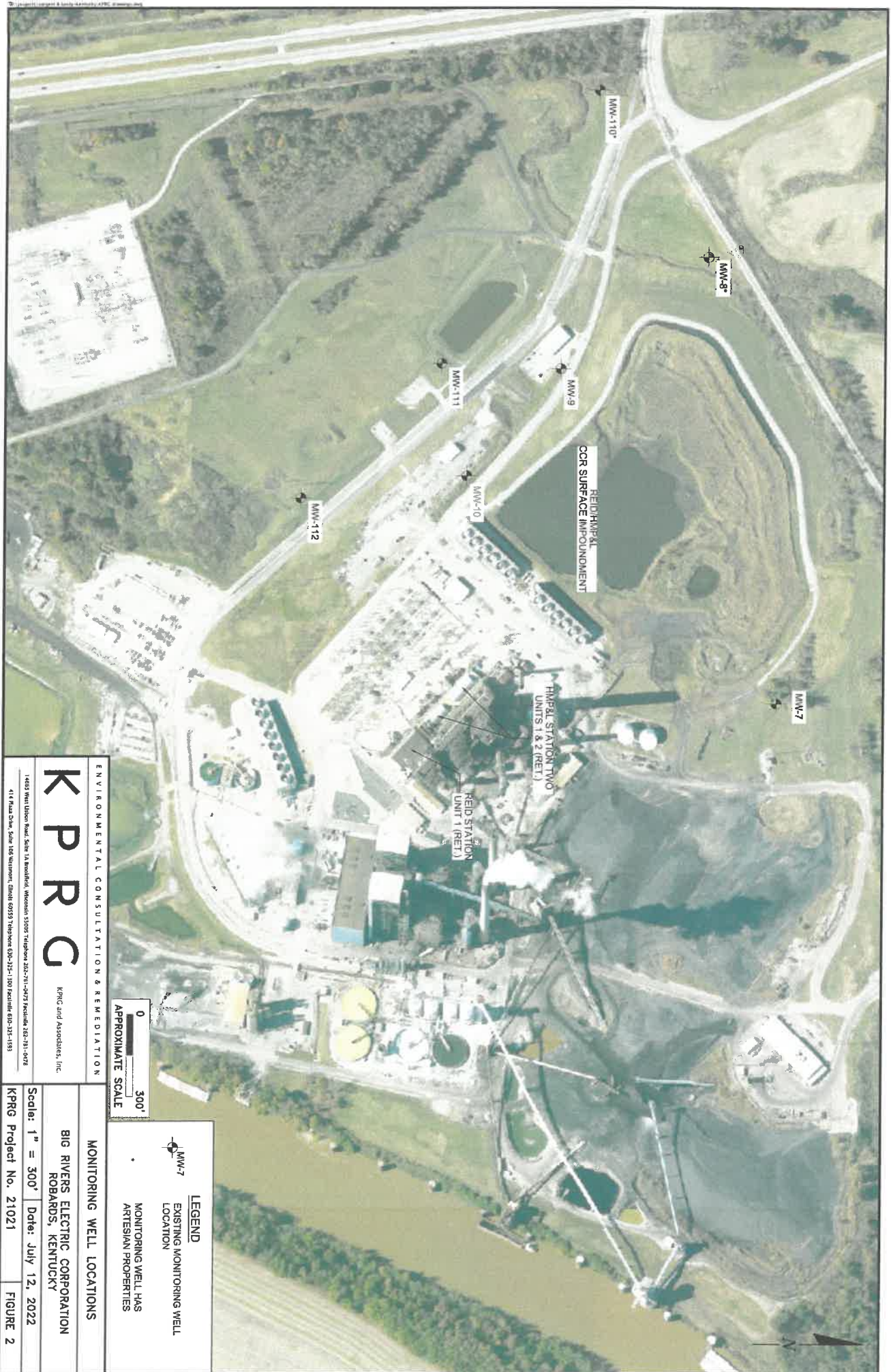
th. Dehlin Thomas Dehlin
2023.07.24
11:39:26-05'00'

8.0 REFERENCES

1. U.S. Environmental Protection Agency. "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface impoundments." 40 CFR 257 Subpart D. <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-257/subpart-D>. Accessed June 14, 2023.
2. Kentucky Administrative Regulations. Title 401, Chapter 046, "Coal Combustion Residuals (CCR)." <https://apps.legislature.ky.gov/law/kar/titles/401/046/110/>. Accessed June 14, 2023.



ENVIRONMENTAL CONSULTATION & REMEDIATION		GENERAL LOCATION MAP	
KPRG KPRG and Associates, Inc. 14655 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478 414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593		BIG RIVERS ELECTRIC CORPORATION ROBARDS, KENTUCKY Scale: 1" = 3,000' Date: August 8, 2022 KPRG Project No. 21021 FIGURE 1	



0 300'
APPROXIMATE SCALE

LEGEND
● MM-7
EXISTING MONITORING WELL
LOCATION
●
MONITORING WELL HAS
ARTESIAN PROPERTIES

MONITORING WELL LOCATIONS

BIG RIVERS ELECTRIC CORPORATION
ROBARDS, KENTUCKY

Scale: 1" = 300' Date: July 12, 2022

KPRG Project No. 21021 **FIGURE 2**

KPRG

KPRG and Associates, Inc.

14655 West Union Road, Suite 1A Louisville, Missouri 63075 Telephone 262-71-5472 Facsimile 262-71-5478

414 Plaza Drive, Suite 105 Westport, Illinois 60553 Telephone 630-325-1300 Facsimile 630-325-1893

Closure Plan for the Green Station CCR Surface Impoundment



Big Rivers Electric Corporation
Robert D. Green Generating Station

Coal Combustion Residual Rule Compliance

Closure Plan for the Green Station CCR Surface Impoundment

Prepared for

**Big Rivers Electric Corporation
Robert D. Green Generating Station
Roberts, Kentucky**

**Revision 3
6/20/2022**

Prepared by

**Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri**

INDEX AND CERTIFICATION

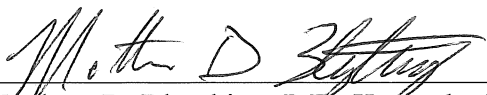
Big Rivers Electric Corporation Closure Plan for the Green Station CCR Surface Impoundment

Report Index

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Certification

I hereby certify, as a Professional Engineer in the State of Kentucky, that the information in this document was assembled under my direct supervisory control. This report is not intended or represented to be suitable for reuse by Big Rivers Electric Corporation or others without specific verification or adaptation by the Engineer.


Matthew D. Bleything, P.E. Kentucky License
#37673

Date: 6/20/22

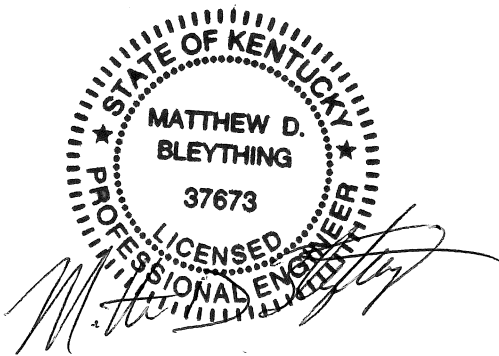


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LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
BREC	Big Rivers Electric Corporation
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
FGD	Flue Gas Desulfurization
KAR	Kentucky Administrative Regulations
KDWM	Kentucky Division of Waste Management
KPDES	Kentucky Pollution Discharge Elimination System
KDOW	Kentucky Department of Water
RCRA	Resource Conservation and Recovery Act
U.S.C.	United States Code

1.0 INTRODUCTION

On April 17, 2015, the Environmental Protection Agency (EPA) issued the final version of the federal Coal Combustion Residuals (CCR) Rule to regulate the disposal of coal combustion residual materials generated at coal-fired units. The rule is administered as part of the Resource Conservation and Recovery Act (RCRA, 42 United States Code [U.S.C.] §6901 et seq.), using the Subtitle D approach.

Big Rivers Electric Corporation (BREC) is subject to the CCR Rule and as such must develop a Closure Plan per 40 Code of Federal Regulations (CFR) §257.102. This document serves as BREC's Closure Plan for the Green Station (Green) CCR Surface Impoundment (Ash Pond).

According to §257.102(b)(1), the Closure Plan must contain the following:

- A description of how the CCR unit will be closed.
 - For in-place closure: A description of the final cover system, the methods for installing the final cover system, and the methods for achieving compliance with the standards outlined in §257.102(d).
 - For closure by removal: A description of the procedures to remove the CCR and decontaminate the CCR unit as outlined in §257.102(c).
- An estimate of the maximum amount of material ever stored in the CCR unit over its active life.
- An estimate of the largest area of the CCR unit ever requiring a final cover as required by §257.102(d) at any time during the CCR unit's active life.
- A schedule for completing closure activities, including the anticipated year of closure and major milestones for permitting and construction activities.

The seal on this report certifies that this document meets the requirements of 40 CFR §257.102(b). This closure plan is in addition to, not in place of, any other applicable site permits, environmental standards, or work safety practices.

The Ash Pond will not be subject to a Post-Closure Plan per §257.104(a)(2) as the impoundment will be closed through removal of the CCR pursuant to §257.102(c).

The closure completion date as presented in this Closure Plan matches the complete Green Station Closure Extension Demonstration (November 2020) that was prepared in response to 40 CFR §257.103(f)(2).

1.1 Impoundment Description

Green is an electric generating station near Robards, Kentucky. The plant consists of Unit 1 and Unit 2 which are respectively 250MW and 242MW (gross) units commercialized in 1979 and 1981 respectively. The plant ceased coal-fired operations of the boilers on April 4, 2022. The boilers have been converted for the combustion of natural gas for the production of power. The plant historically utilized the Ash Pond to manage the CCR and non-CCR wastestreams. The Ash Pond was constructed when the plant was built and has been in service for the life of the plant. The CCR wastestreams that were managed in the Ash Pond included sluiced bottom ash, economizer ash and Flue Gas Desulfurization (FGD) wastewater. All fly ash was handled dry. The various non-CCR wastewaters routed to the Ash Pond originate from the Unit 1 and 2 boiler sumps, metal cleaning wastes, clarifier blowdown, bottom ash hopper seal water, miscellaneous drains including roof drains, landfill leachate, and various stormwater sources. A site plan is included in Appendix A.

1.1.1 CCR Inventory and Extent

Depth of impounded water and CCR is 3 feet and 18 feet (at respective locations of maximum impounded water and CCR depths). Elevation of impounded water and CCR is 396 feet and 400 feet, respectively, above mean sea level. These approximate depths and respective elevations are based on the most recent (October 2018) flight derived topographic contours and bathymetric survey data.

The remaining storage capacity is approximately 230,000 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.

The approximate volume of CCR currently stored in the Ash Pond is 1,000,000 cubic yards. The maximum storage capacity is 1,230,000 cubic yards. This volume was calculated based on the most recent bathymetric survey, and the best available as-built data for the construction prior to placement of CCR.

1.2 Closure Method

The Ash Pond will be closed through removal of CCR. CCR will be excavated from the Ash Pond to the bottom elevation shown on the original construction drawings. The CCR will be dewatered, removed, and hauled to the on-site CCR landfill for final placement. Construction of several wells or well-points may be required around the pond for water management prior to and during CCR removal. Once the CCR is removed from the Ash Pond, the existing pond will be repurposed as a non-CCR Wastewater Pond. No

additional modifications are expected, and the pond will continue to operate within current KPDES limits at the existing Outfall 009.

To facilitate the pond closure, the existing non-CCR wastestreams will need to be managed. The pond water level will be lowered as much as feasible after ceasing receipt of CCR, prior to the construction contractor coming on site. When the construction contractor begins construction, the remaining non-CCR wastestreams will be managed using a series of temporary berms, ditches, and pumps to divert non-CCR wastestreams to other locations. Additionally, wells, well points and other means of water management may be employed by the construction contractor. Dewatering operations will be in accordance with KDOW, KPDES Permit requirements. The sequencing of construction and means and methods for the water management will be determined by the construction contractor once a contract is finalized with BREC.

When the CCR removal is complete and the new Wastewater Pond is in service, all remaining stormwater and non-CCR wastestreams will continue to be managed in the new pond and will continue to discharge through the existing KPDES outlet. The contractor will then finalize construction by seeding and stabilizing the remaining disturbed areas.

Visual observations will be conducted by a qualified third party Professional Engineer and KDWM representatives to verify that the CCR material has been removed from the impoundment consistent with 401 KAR 46:110 Section 9 and 40 CFR 257.102(c). BREC does not plan to perform sampling or analysis to confirm CCR removal. A projected schedule will be provided to KDWM once a construction contractor is selected to allow for inspection of ongoing work by KDWM representatives. Additional waste to be removed includes utility waste such as incidental soil, rock, or other materials excavated as a part of the CCR removal. Incidental materials may remain commingled with the CCR during transportation and disposal in the onsite CCR Landfill(s).

Once all CCR material has been removed, groundwater monitoring will be conducted as indicated in Section 1.2.2 to confirm CCR removal and decontamination has been completed pursuant to §257.102(c) of the CCR Rule.

1.2.1 Closure Schedule

According to §257.101 of the CCR Rule, closure of the existing impoundment must commence no later than 6 months following the date on which a closure event is triggered, or no later than 30 days following the last known receipt of CCR or non-CCR wastewater by the impoundment. The plant ceased coal-fired operations of the boilers on April 4, 2022. However, the Ash Pond will continue to manage non-CCR

wastestreams. The closure project documents have been finalized and construction anticipated to begin in June 2022.

The estimated closure schedule is as follows:

Mobilization	July 2022
Pond Dewatering	July 2022 – August 2023
Removal of CCR	July 2022 – August 2023
Winter Shutdown	December 2022 – March 2023
Finished Surfacing and Demobilization	August 2023 – September 2023
Deadline to complete removal of CCR	October 17, 2023

1.2.2 Closure Completion

When BREC has removed the CCR from the impoundment, certified by a third-party Professional Engineer and inspected by KDWM, BREC will submit a construction progress report for acceptance under 401 KAR 46:110.

Groundwater monitoring will continue pursuant to 401 KAR 46:110 Section 8 and the CCR rule, 40 CFR 257.94, until such time that the CCR has been removed, as certified by a Professional Engineer and a CPR accepted by KDWM. It should be noted that the Green Ash Pond has remained in Detection Monitoring since the pond has been regulated under 40 CFR 257.

At the conclusion of closure by removal and cessation of the detection monitoring program, BREC will submit to the KDWM-Solid Waste Branch for review and approval, a groundwater monitoring well abandonment plan meeting the requirements of 401 KAR 6:350 for abandonment of the said Ash Pond groundwater monitoring well network. A subsequent CPR documenting the monitoring well abandonments will be submitted to KDWM for review. Once the well abandonment CPR is accepted, a permit revision will be issued reflecting the acceptance of the CPR by KDWM and the termination of the CCR Surface impoundment activity.

Within 30 days of completion of closure of the impoundment, BREC must prepare a notification of closure of the impoundment and place it in the facility's CCR Operating Record and on BREC's CCR public website. This notification shall include certification by a Professional Engineer in the State of Kentucky verifying that closure has been completed in accordance with this Closure Plan and the requirements of §257.102.

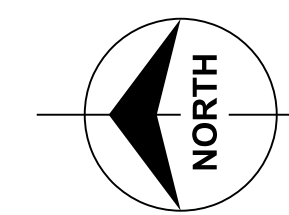
2.0 REVISIONS AND AMENDMENTS

The initial Closure Plan was placed in the CCR Operating Record on October 11, 2016. If the Closure Plan is revised, the written Closure Plan will be amended no later than 30 days following the triggering event. Additionally, the written Closure Plan will be amended at least 60 days prior to a planned change in the operation of the Impoundment, or no later than 60 days after an unanticipated event. The initial Closure Plan and any amendment will be certified by a qualified professional engineer in the State of Kentucky for meeting the requirements of §257.102 of the CCR Rule. All amendments and revisions must be placed on the CCR public website within a reasonable amount of time following placement in the facility's CCR Operating Record. A record of revisions made to this document is included in Section 3.0 of this document.

3.0 RECORD OF REVISIONS AND UPDATES

Date	Revisions Made	By Whom
10/11/2016	Initial Issue	Associated Engineers, Inc.
09/13/2017	Revision 1	Associated Engineers, Inc.
11/24/2020	Revision 2 – Updated schedule and added detail to closure method	Burns & McDonnell
06/17/2022	Revision 3 – Updated closure method to closure by removal	Burns & McDonnell

APPENDIX A - SITE PLAN



0 200' 400'

SCALE IN FEET

**FOR PERMITTING
PURPOSES ONLY**

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CREATE AMAZING.

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