

Meramec Energy Center CCR Surface Impoundment MCPD (Pond 498) CCR Unit Closure Plan

Prepared for



Prepared by



1055 Corporate Square Drive
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Revised
February 2021

**Ameren Missouri
Meramec Energy Center
CCR Surface Impoundment MCPD (Pond 498)
CCR Unit Closure Plan**

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CERTIFICATION

I hereby certify, as a Professional Engineer in the state of Missouri, that the Closure Plan and the Final Cover System discussed herein satisfy the requirements of 40 CFR §257.102(b). I assume responsibility only for what appears in this Closure Plan and disclaim (pursuant to Section 327.411 RSMo) any responsibility for all other plans, estimates, specifications, reports, or other documents or instruments not sealed by me relating to or intended to be used for any part or parts of the project to which this Closure Plan refers.

Name: Eric J. Karch, P.E.
Date: February 2, 2021
Missouri License Number: 2007005040
Expiration Date: December 31, 2021

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1.0 INTRODUCTION

On April 17, 2015, the Environmental Protection Agency (EPA) issued the final version of the federal Coal Combustion Residual Rule (CCR Rule) to regulate the disposal of coal combustion residual (CCR) materials generated by electric utilities and independent power producers.

In compliance with the CCR Rule, Ameren Missouri (Ameren) is required to develop a Closure Plan for existing CCR surface impoundments per 40 Code of Federal Regulations (CFR) §257.102. This document presents Ameren's Closure Plan for the existing CCR Unit/Surface Impoundment MCPD (Pond 498) at the Meramec Energy Center (Meramec). As required in §257.102(b)(1), this Closure Plan contains the following:

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

The CCR Unit will also be subject to the post-closure care requirements contained in §257.104. A separate Post-Closure Plan has been developed.

2.0 CLOSURE PLAN

2.1. Facility and Surface Impoundment Description

The Meramec Energy Center is located near Oakville, Missouri and consists of four generating units (a site aerial is included as Appendix A). Units 1 and 2 are fired with natural gas (fuel was switched from coal to natural gas in April 2016), and Units 3 and 4 are fired with coal. CCRs generated at the facility include fly ash and bottom ash.

Surface Impoundment MCPD (Pond 498) is located on the north central portion of the Meramec facility. As-built construction documents are not available to document that a liner system was installed as part of the original construction of MCPD; therefore, MCPD has been classified as an existing, unlined CCR surface impoundment. A portion of MCPD was modified in 2001 by adding a 60-mil high-density polyethylene (HDPE) bottom liner. The modified portion is also considered unlined per the CCR Rule.

2.1.1. CCR Inventory and Extent

The lined portion of MCPD has an approximate surface area of 21 acres which represents the largest area that would require a final cover. The estimated maximum inventory of CCR in MCPD over its active life is approximately 1,017,000 cubic yards (CY) of CCR material.

2.2. Closure Method

The CCR Rule allows for CCR Units to be closed through removal of CCR or by leaving CCR material in-place. MCPD is planned to be closed with CCR material remaining in-place, and accordingly, will follow the closure performance standards referenced in 40 CFR §257.102(d).

2.2.1. Drainage / Stabilization of CCR Material

Prior to installing the final cover system, Ameren will complete the following activities outlined in §257.102(d) of the CCR Rule:

- Eliminate free liquids by removing liquid wastes or solidifying the remaining wastes and waste residues.
- Stabilize remaining wastes sufficiently in order to support the final cover system.

Free liquids will be removed, with excess water discharged under the Meramec Energy Center's existing NPDES Permit. Free liquid removal will be performed throughout construction, as necessary to manage surface water and storm water runoff. Once stabilized, the CCR will be compacted and graded to promote drainage.

2.2.2. Final Cover System

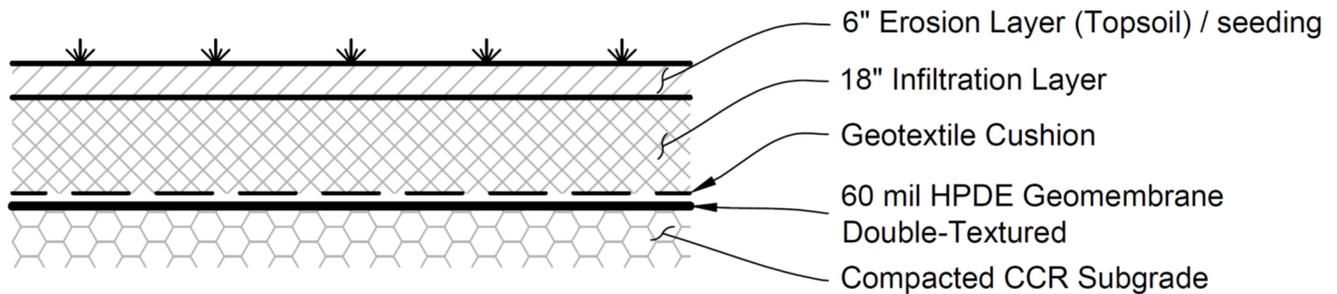
The final cover system will be designed and constructed to meet the following criteria pursuant to §257.102(d)(3)(i) and (ii):

- Permeability of the final cover system must be less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 1×10^{-5} centimeters per second (cm/sec), whichever is less.
- Infiltration of liquids through the closed CCR Unit must be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material.
- Erosion of the final cover system must be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining vegetation.
- Disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence.
- The owner or operator may select an alternative final cover system design, provided the alternative final cover system meets the above requirements.

MCPD will be capped and closed in-place as described herein in accordance with the requirements of the CCR Rule. MCPD will be closed using an alternative cover system, which includes (from bottom to

top): a 60-mil high density polyethylene (HDPE) flexible geomembrane liner, a geotextile cushion, a nominally compacted 18-inch infiltration soil layer, and a 6-inch erosion layer that is capable of sustaining vegetation. A typical cross section of this alternative cover system is shown in Figure 1.

Figure 1 – Final Cover System



A construction quality assurance (CQA) plan will be developed and the CQA program will be implemented during construction of the cover system.

2.2.2.1. Permeability and Infiltration

The CCR Rule requires that the permeability of the MCPD's cover system be less than or equal to that of the bottom liner, natural underlying subsoils, or 1×10^{-5} cm/sec, whichever is less. As discussed above, documents for the original construction of MCPD are not available. MCPD was reportedly constructed by excavating soils within MCPD (silts and clays), and the excavated materials were utilized for pond berms. The lined portion of MCPD included a 60-mil HDPE bottom liner. The proposed cover system will include a 60-mil HDPE liner, 18-inch infiltration soil layer, and a 6-inch erosion layer which has equivalent or less permeability than the existing bottom liner, and meets or exceeds the requirements of the CCR Rule.

2.2.2.2. Geometry and Stormwater Management

The geometry and stormwater management controls of MCPD following closure will allow the CCR Surface Impoundment to meet the following requirements outlined in §257.102(d) of the CCR Rule:

- Control, minimize, or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere.
- Prevent future impoundment of water.
- Provide for slope stability to protect against sloughing or movement of the final cover system.

The closure system will be designed to provide adequate drainage during storm events. Intermediate swales will be utilized to limit the maximum overland flow distance, thereby minimizing ponded water, as well as limiting the infiltration of run-off.

2.2.2.3. Integrity of the Final Cover

Settling and subsidence of the final cover system is expected to be minimal. Settlement would potentially be caused by consolidation of the CCR material, general fill material, or underlying natural subsoils due to the dynamic loads typically resulting from construction activities; consequently, this settlement is expected to be minimal following final cover installation activities. General fill will be installed in a controlled manner to minimize post-fill installation settlement. Maintenance will be conducted as necessary to maintain the integrity of the final cover, as outlined in the Post-Closure Plan for MCPD (a separate document).

2.2.3. Final Cover Schedule

According to §257.101 of the CCR Rule, closure of the MCPD will commence no later than six months following the date on which a closure event is triggered. For the purposes of this Plan, closure of the lined portion of MCPD will assumed to have commenced when Ameren has ceased placing CCR material into MCPD and has completed any of the following actions or activities:

- Taken any steps necessary to implement the written Closure Plan.
- Submitted a completed application for any required state or agency permit or permit modification.
- Taken any 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 of a CCR Unit.

In the event that closure of MCPD is required due to a location restriction or groundwater impacts, but not a safety factor assessment, the CCR unit may continue to receive CCR material beyond the six-month maximum duration, provided that MCPD satisfies the criteria specified in §257.103(a) or §257.103(b).

No later than the date Ameren initiates closure of MCPD, a Notification of Intent to Close the CCR Unit will be prepared. The notification will be considered to be completed when it has been placed in the facility's CCR Operating Record. The notification will then be placed on Ameren's CCR public website within 30 days.

2.2.3.1. Closure Completion

Closure for MCPD shall be completed within five years of commencing closure activities per the CCR Rule. The timeframe for completing closure of the CCR Unit may be extended if Ameren demonstrates that it is not feasible to complete closure of the CCR Unit within the required timeframe due to factors beyond the facility's control. A demonstration for an extension of the closure timeframe shall be completed pursuant to §257.102(f)(2).

For the purpose of this Closure Plan, closure of MCPD is considered complete when the final cover system is installed and applicable construction completion documentation is finalized. Based on the closure schedule provided in Appendix B, it is estimated that the closure of MCPD will be completed in less than five years. Closure of the approximate 21-acre lined portion of MCPD is expected to be completed in 2021.

Within 30 days of completion of closure of MCPD, Ameren will prepare a notification of closure and post it on the facility’s CCR Operating Record and on Ameren’s CCR public website. This notification will include certification by a professional engineer, registered in the State of Missouri verifying, that closure has been completed in accordance with this Closure Plan and the requirements of §257.102.

In accordance with §257.102(i), Ameren will record a notation on the deed to the property, following completion of closure. This notation is to inform any potential future owner of the property of the previous use of the land, and that the land is restricted by post-closure care requirements.

3.0 REVISIONS AND AMENDMENTS

The MCPD Closure Plan will be amended whenever there is a change in operation of the CCR unit that affects the current or planned closure operations. The Closure Plan will be amended 60 days prior to a planned change in operation, or within 60 days following an unplanned change in operation. If a written Closure Plan is revised after closure activities have commenced, the written Closure Plan will be amended no later than 30 days following the triggering event. The initial Closure Plan and any amendment will be certified by a professional engineer in the State of Missouri for meeting the requirements of §257.102 of the CCR Rule. All amendments and revisions will be posted on the CCR public website within 30 days following placement in the facility’s CCR Operating Record. A record of revisions made to this document is included in Section 4.0 of this document.

4.0 REVISIONS AND AMENDMENTS

Revision	Date	Revisions Made	By Whom
0	10/13/2016	Initial Closure Plan	Burns & McDonnell
1	11/14/2016	Revisions to cover page to use Ameren’s standard cover page, and Section 2.2.3.1 to include estimated year of MCPD closure	Burns & McDonnell
2	02/02/2021	Revisions to final cover system in Section 2.2.2 and other sections to reflect closure schedule	Reitz & Jens, Inc.

Appendix A
Site Aerial Figure



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SITE AERIAL

MERAMEC ENERGY CENTER
SURFACE IMPOUNDMENT MCPD
LINED PORTION CLOSURE

AMEREN MISSOURI
3700 S. Lindbergh
St. Louis, MO 63127

Appendix B
Closure Schedule



Meramec Energy Center CCR Surface Impoundment MCPD (Pond 498) Closure Schedule

