
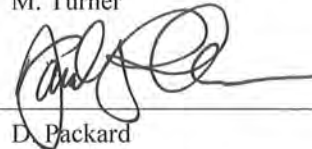




Closure Plan for Inactive CCR Surface Impoundments

Prepared for Interstate Power and Light Company
Sutherland Generating Station
Marshalltown, IA

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I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa:



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1. INTRODUCTION

Interstate Light and Power Company (IPL) – a wholly owned subsidiary of Alliant Energy – operates the Sutherland Generating Station (SGS), located east of Marshalltown, IA, in Marshall County. SGS has four inactive coal combustion residual (CCR) surface impoundments, collectively known as the Main Ash Settling Area. The Main Ash Settling Area was commissioned in the late 1950s and was used as a bottom ash settling impoundment until the station’s conversion to natural gas in April of 2012. As a result of accumulated CCR, the impoundment was reconfigured into a four pond system with an area on the north side of the impoundment area for stockpiling bottom ash. The four inactive CCR surface impoundments are known as the Primary (North) Pond, the Primary (South) Pond, the Secondary (Main) Pond, and the Polishing Pond. There is an additional pond at the northeast corner of this area, the Discharge Pond. This pond was not designed to hold, treat, or dispose of CCR and therefore is not subject to the CCR Rule. The Station is currently planning to decommission the four inactive CCR surface impoundments within the Main Ash Settling Area.

A hydrated fly ash pile is located approximately 300 feet south of the southern edge of the Main Ash Settling Area. This ash stockpile was generated by dry fly ash captured in the electrostatic precipitators which was then hydrated for stabilization. The pile has not received CCR on or after October 19, 2015, and is not subject to the closure or post-closure requirements identified in the CCR Rule. Thus, the hydrated fly ash pile is not discussed further herein.

To comply with the requirements of the USEPA Final CCR Rule (40 CFR 257.50 thru 257.107), IPL submits the following Closure Plan detailing the steps to be undertaken to close the existing CCR unit, in accordance with §257.102(b) of the CCR Rule.

This document provides the following required information:

- Facility information
- Estimate of the maximum inventory of CCR on-site
- Proposed CCR surface impoundment closure procedure
- Description of the proposed final cover system over the CCR material
- Schedule for completing all closure activities

This closure plan applies to the closure of the Primary (North) Pond, the Primary (South) Pond, the Secondary (Main) Pond, and the Polishing Pond.

The overall layout of the Main Ash Settling Area is shown in Figure 1.



Figure 1 – Current Layout of Sutherland Generating Station

The Main Ash Settling Area is located approximately 800 feet east of the power block. It is made up of five smaller interconnected impoundments separated by internal berms. The ponds include:

- Primary (North) Pond (approx. 0.37 acres)
- Primary (South) Pond (approx. 0.17 acres)
- Secondary (Main) Pond (approx. 5.3 acres)
- Polishing Pond (approx. 1.1 acres)
- Discharge Pond (approx. 0.1 acres)

The Primary (North) Pond received sluiced bottom ash, primarily from the Units 1 & 2 pulverized coal units, via a discharge pipe directly from the Station.

The Primary (South) Pond historically received slag from Unit 3 cyclone boiler.

Typical Station operations called for the bottom ash/slag to be dredged out of both primary ponds and stockpiled in an area immediately north of the ponds within the original containment dike.

Water from both primary ponds is discharged via a culvert into the northwest portion of the Secondary (Main) Pond. Water from the Secondary (Main) Pond flows into the Polishing Pond via a concrete lined mixing channel, then into the Discharge Pond via a metering flume. Lastly, the water

enters a discharge riser structure and exits the diked impoundment area. Water then flows through a wide naturally vegetated swale located between sets of railroad tracks to the NPDES-permitted outfall.

Overall, the Main Ash Settling Area is approximately 720 feet in the east-west direction and 890 feet in the north-south direction (14.7 acres) measured to the outside top of the original containment berms.

The Station retired in 2017 and no longer sends low-volume waste water or cooling tower blowdown to the Ash Ponds. The Ash Ponds continue to receive coal yard sump pit discharge, which is primarily storm water runoff that contacts the coal yard.

2. PROPOSED CCR IMPOUNDMENT CLOSURE PROCEDURE

The proposed Main Ash Settling Area closure includes the following tasks:

- a. Dewatering of all ponds in the Main Ash Settling Area,
- b. Consolidation of the Main Ash Settling Area,
- c. Regrading of Secondary (Main) Pond into four (4) "mounds",
- d. Capping of consolidated and graded CCR material,
- e. Establishing final grades to preclude ponding storm water on the cap,
- f. Direct non-contact storm water drainage off the cap:
 - o Natural sheet flow along the southern-facing slopes of each mound
 - o Runoff is collected in E-W vegetated ditches that channel the flow to the perimeter berm to be discharged via culverts evenly spaced along the perimeter of the site.
- g. Restoration of all areas disturbed during construction.

Based on the schedule included in this Plan, it is technically feasible to complete closure of the CCR disposal facilities within the designated time frame and in compliance with the CCR Rule. The proposed cover system will meet the requirements of both the Federal CCR Rule and State regulations. Its integrity will be maintained by way of precautionary measures as described in the Post-Closure Plan.

The proposed grading for the final cap over the existing surface impoundment is designed to allow for adequate drainage of rainwater off the cover system. The grading will also allow for a potential solar photovoltaic development following closure of the ash disposal area. Slopes will range from a minimum of approximately 2.5% to a maximum of 3H:1V.

The existing perimeter berm will be refurbished to provide a minimum 15 feet wide aggregate roadway for vehicular access around the full perimeter of the site. Additionally, intermediate crushed aggregate paths may be provided along some or all of the mound ridges. No modifications other than the placement of the aggregate roadway are expected along the northernmost existing perimeter berm.

3. PROPOSED COVER SYSTEM

The final cover will meet the minimum requirements of 40 CFR 257.102(d)(3)(i)(A) thru (D). The baseline cover system will consist of a compacted 18" thick "infiltration layer" of appropriate low-permeability material having a hydraulic conductivity of no more than 10^{-5} cm/s, under a 6" thick "erosion layer" of soil capable of sustaining a vegetative cover, with a suitable seed mixture.

As an alternate cover system, a geosynthetic clay liner (GCL) /HDPE composite overlain with 18" of soil capable of sustaining vegetative growth may be used. A GCL is a manufactured clay liner consisting of bentonite (sodium montmorillonite) clay encapsulated between two layers of woven geotextile. It is placed directly atop the CCR subgrade and is activated by the moisture provided in the protective soil cover. If used, the GCL will provide a hydraulic conductivity which is less than the 1×10^{-5} cm/s requirement in the CCR Rule. It will also accommodate settling and subsidence.

The materials of the cover system will be placed and compacted as required to minimize infiltration, limit erosion and future maintenance, and maintain positive drainage. Soil properties, compaction, permeability, and thickness testing will be performed to confirm compliance with the CCR Rule. Regular maintenance of the seeding will take place until the vegetative cover is established and self-sustaining, in order to prevent premature erosion of the topmost layer.

All other areas that are disturbed during the surface impoundment closure activities will be restored, either by providing a vegetative cover or aggregate surfacing.

4. ESTIMATED MAXIMUM INVENTORY OF CCR

Since the original Ash Pond functioned as a single rectangular impoundment prior to being reconfigured into its current layout, it is reasonable to assume that internal berms are primarily constructed out of previously deposited CCR, along with relatively small quantities of rip rap.

The estimated total amount of CCR material that will be consolidated into the Main Ash Settling Area is 246,000 cy.

5. ESTIMATED MAXIMUM AREA OF COVER

It is estimated that the proposed cover system will occupy an area equal to the area of the existing Main Ash Settling Area which is 14.7 acres.

6. SCHEDULE

Closure of the existing CCR surface impoundments is anticipated to require one year to complete. Alliant Energy will obtain certification from an Iowa licensed professional engineer that the CCR surface impoundments were closed in compliance with the Closure Plan. The certification will be placed in the Station's operating record within 60 days of completing closure.



TABLE 2: PLANNING LEVEL SCHEDULE FOR CLOSURE OF CCR SURFACE IMPOUNDMENTS

| Task Description | Anticipated Start Date | Anticipated Completion Date |
|--|------------------------|-----------------------------|
| Pre-Design Activities | | |
| Preparation of <i>Closure Plan</i> for compliance with Federal CCR Rule | 02/2018 | 04/2018 |
| Post initial <i>Closure Plan</i> in the Station's Operating Record | 04/2018 | 04/2018 |
| Send a Notification of the availability of the Closure plan to the Relevant State Director and publish <i>Closure Plan</i> to the Station's Internet Website | 04/2018 | 04/2018 |
| Place initial <i>Post-Closure Plan</i> in the Station's Operating Record | 04/2018 | 04/2018 |
| Send Notification of availability of <i>Post-Closure Plan</i> to the State Director and place <i>Post-Closure Plan</i> to the Station's Internet Website | 04/2018 | 04/2018 |
| Design / Bidding / Permitting | | |
| Engineering / Preparation of Bid documents | 03/2018 | 06/2018 |
| Issue Request for Bids | 06/2018 | 07/2018 |
| Bids due | 08/2018 | 08/2018 |
| Bid Evaluation Period | 08/2018 | 01/2019 |
| Issue Award and Notice to Proceed | 02/2019 | 02/2019 |
| Construction | | |
| Initiation of Close-In-Place Activities | 03/2019 | 03/2019 |
| Contractor Mobilization | 03/2019 | 04/2019 |
| Dewater ponds | 04/2019 | 04/2019 |
| Consolidate CCR material and regrade Secondary (Main) Pond into four (4) "mounds" | 04/2019 | 06/2019 |
| Cap consolidated CCR material | 06/2019 | 07/2019 |
| Establish final grades | 07/2019 | 08/2019 |
| Reroute non-contact storm water to culverts for discharge | 08/2019 | 09/2019 |
| Restore all disturbed areas | 09/2019 | 09/2019 |
| Post-Construction Administration | | |
| Certification verifying the completion of closure in accordance with the closure plan | 10/2019 | 10/2019 |



| Task Description | Anticipated Start Date | Anticipated Completion Date |
|---|-------------------------------|------------------------------------|
| Place a Notification of CCR Surface Impoundment Closure Completion in the Station's Operating Record | 11/2019 | 11/2019 |
| Send Notification of availability of Closure Completion to Relevant State Director / place Closure Completion to the Station's Internet Website | 11/2019 | 11/2019 |
| Record a Notation of the CCR Impoundment Closure on the Deed of the Property | 11/2019 | 11/2019 |
| Place a Notification of the Deed Notation in the Station's Operating Record | 11/2019 | 11/2019 |
| Send Notification of availability of Deed Notation to Relevant State Director / place Deed Notation to the Station's Internet Website | 11/2019 | 11/2019 |
| Place a Notification of Completion of the Post-Closure Care in the Station's Operating Record | 10/2050 | 10/2050 |
| Send a Notification of the availability of the Post-Closure Care to the Relevant State Director and place Post-Closure Care to the Station's Internet Website | 11/2050 | 11/2050 |

7. COMPLETION OF CLOSURE ACTIVITIES

To confirm completion of the CCR surface impoundment closures, IPL will retain a qualified engineer licensed in the State of Iowa to verify that the CCR surface impoundments have been closed in accordance with this closure plan and the requirements of 40 CFR 257.102(d). The qualified engineer will provide IPL with a written certification stating compliance as required in 40 CFR 257.102(f)(3). The Post-Closure Plan is presented in a separate document.

8. CERTIFICATIONS

It is S&L's opinion that this written closure plan meets the requirements of 40 CFR 257.102(b).

It is also S&L's opinion that the proposed final cover system as described herein meets the design requirements of 40 CFR 257.102(d)(3)(i).

9. REFERENCES

- 40 CFR Part 257, Subtitle D, – Environmental Protection Agency Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities