

Coal Combustion Residual Surface Impoundment Closure Certification

**Basin Electric Power Cooperative
Leland Olds Station**

October 2020

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Background and Purpose

Leland Olds Station (**LOS**) is a lignite coal-fired power plant consisting of two units that generate about 669 megawatts (**MW**) combined. The power plant, owned and operated by Basin Electric Power Cooperative (**Basin Electric**), is located approximately four miles southeast of Stanton in Mercer County, North Dakota.

The purpose of this document is to demonstrate compliance with 40 CFR § 257.102 (Criteria for conducting the closure or retrofit of Coal Combustion Residual (**CCR**) units) for the final closure of Ash Pond 2 and Pond 3 at LOS. 40 CFR § 257.102(h) requires the owner or operator of a CCR unit to prepare a notification of closure for the CCR Unit. The closure notification must include a certification by a qualified professional engineer that the closure has been completed in accordance with the written closure plan and the requirements of 40 CFR § 257.102.

Closure History

A temporary ash handling system, consisting of above-ground concrete weirs and ash collection and dewatering areas, was placed into operation in 2015. This system ended the transport of CCRs to the surface impoundments prior to effective date of the CCR Rule (October 19, 2015). Accordingly, the LOS surface impoundments are considered “inactive” under the federal regulations. A “Notification of Intent to Initiate Closure of CCR Surface Impoundment” for Ash Pond 2 and Pond 3 was completed on December 15, 2015, in accordance with § 257.100. On April 18, 2016 the U.S. Environment Protection Agency (**EPA**) filed a motion to remand and vacate the provisions of the CCR Rule exempting inactive surface impoundments from the CCR Rule requirements. The DC Circuit Court of Appeals issued an order approving the motion on June 14, 2016. Since the exemption for inactive surface impoundments was no longer effective, EPA issued the “Extension Rule” on August 5, 2016. The Extension Rule became effective on October 4, 2016 providing a timeline for inactive units to comply with CCR Rule requirements.

Pond 2 was partially closed in 2017. Approximately 23 acres in the south and southwest areas of the pond were closed in accordance with the design standards specified in 40 CFR § 257.102 and North Dakota Department of Environmental Quality (**NDDEQ**) permit requirements. The

remaining areas of Ash Pond 2 and Pond 3 were closed during the 2019 and 2020 construction seasons.

Closure Narrative

The ash ponds were dewatered and existing CCRs were stabilized by air drying and/or mixing with imported soils. Existing soils were graded to the required subgrade elevations to allow for positive drainage as well as installation of the final cover system (described in detail below). The perimeter dike on the north side of the pond complex was removed to preclude the possibility of the future impoundment of liquids. The final cover was graded with slopes less than 15 percent in accordance with NDDEQ rules and guidance.

A three (3) feet thick final cover system was constructed with the following components:

- A 1.5 foot thick compacted clay barrier layer, with a hydraulic conductivity less than or equal to 1×10^{-7} cm/sec;
- A 1 foot thick plant root zone layer; and
- A 0.5 foot thick suitable plant growth material (**SPGM**) layer.

The barrier layer was moisture-conditioned and compacted to achieve permeabilities of 1×10^{-7} cm/sec or less. Construction Quality Assurance/Quality Control (**QA/QC**) methodologies consistent with the NDDEQ guidelines were utilized so that the final cover is constructed to meet the requirements set forth in the CCR Rule and in NDDEQ rules and guidance. After the barrier layer was constructed, an additional 1.5 feet of cover materials were placed over filled areas. Final cover slopes are consistent with the NDDEQ rules and guidance, promoting run-off without being subject to excessive erosion.

Closed areas were then seeded with shallow-rooted native vegetation. The closed landfill will not be used for cultivated crops, heavy grazing or any other use which might disturb the protective vegetative and soil cover.

Final Cover System Design and Performance

The cover system is comprised, from bottom to top, of a barrier layer consisting of a minimum of 18 inches of compacted clay-rich soil with a hydraulic conductivity of 1×10^{-7} cm/second or less overlain by a minimum of 18 inches of un-compacted material to serve as a vegetation growth medium and rooting zone. Total thickness of the final cover system is a minimum of 36 inches.

CCR Rule design standards require a low permeability barrier layer (infiltration layer) with a permeability less than or equal to the bottom liner system or natural subsoils present, or a permeability of no greater than 1×10^{-5} cm/sec, whichever is less. The design standards also require that the infiltration layer have a minimum thickness of 18 inches and the infiltration layer be overlain by an erosion layer capable of sustaining native plant growth with a minimum thickness of six inches.

The surface impoundments were constructed without an engineered bottom liner and are underlain by natural subsoils of glacial and alluvial origin, with hydraulic conductivities ranging from about 1×10^{-6} to 1×10^{-4} cm/sec. Third party QA/QC testing demonstrated the permeability of the cover system barrier (infiltration layer) to be 1×10^{-7} cm/sec or less, which is lower than permeability of the natural subsoils present. Accordingly, the cover system meets the design criteria for permeability.

The final cover system was constructed with an infiltration layer thickness of 18 inches which is consistent with the minimum requirement of 18 inches. The erosion layer was constructed with a minimum thickness of 18 inches, which is much greater than the minimum required thickness of six inches. As such, the cover system meets the minimum thickness design criteria for both the infiltration layer and for the erosion layer.

Performance standards include ensuring the CCR unit closure system controls, minimizes or eliminates, to the maximum extent feasible, post-closure infiltration of liquids into the waste; precludes the probability of impoundment of water, sediment, or slurry; addresses slope stability; minimizes the need for further maintenance; and that closure be completed in a time consistent with recognized and generally accepted good engineering practices.

The various components of the cover system work synergistically to meet CCR Rule performance standards. Infiltration is minimized by using a combination of slope to promote run-off, shallow-rooted native vegetation to enhance evapotranspiration, and a low permeability barrier layer to further limit infiltration. The closed pond complex has been sloped to promote run-off thus limiting the probability of impounding liquids, slurry or sediment. The relatively gentle slopes (typically less than 15 percent) and native vegetation on the cover system contribute to structural stability and helps minimize the need for future maintenance. Surface impoundment closure construction efforts were timely, consistent with NDDEQ rules and guidance, and were conducted in accordance with generally accepted good engineering practices.

Recordkeeping and Reporting

A copy of this document will be placed into the facility's operating record in accordance with 40 CFR § 257.105 (Recordkeeping Requirements) and will be posted to Basin Electric Power Cooperative's CCR Web site in accordance with 40 CFR § 257.107 (Publicly accessible internet site requirements). Notification will be sent to the relevant State Director in accordance with 40 CFR § 257.106 (Notification Requirements).

Certification Statement

I certify that the closure of LOS Ash Pond 2 and Pond 3 has been completed in accordance with the written closure plan and the requirements of 40 CFR § 257.102 as specified in the *Standards for the Disposal of Coal Combustion Residuals in Landfills and Impoundments*.



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