Coal Combustion Residual
Surface Impoundment
Annual Inspection
2017

Basin Electric Power Cooperative
Leland Olds Station

January 2018

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Purpose and Definitions

In accordance with 40 CFR §257.83, the purpose of this Surface Impoundment Annual Inspection (Inspection) is to provide an annual inspection and review of available information regarding the status and condition of Coal Combustion Residual (CCR) Surface Impoundments at the Basin Electric Power Cooperative (Basin Electric) Leland Olds Station (LOS) Ash Pond 2 and Pond 3.

LOS operates two primarily lignite-fired boilers, with the addition of sub-bituminous Powder River Basin Coal from Wyoming, resulting in the production of CCRs. CCRs are defined in 40 CFR §257.53 (Definitions) as:

"*CCR means fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers.*"

CCRs generated at LOS (and thus regulated under 40 CFR §257) include bottom ash and fly ash. Fly ash from both units is collected using electrostatic precipitators. The fly ash is then dry handled for beneficial reuse or landfill disposal at the LOS landfill. Bottom ash from both generating units is sluiced in water and transported via pipe to a series of weirs where the bottom ash is settled out. The dry bottom ash is then dry handled for beneficial use or landfilled at the LOS landfill.

Impoundment Descriptions

The LOS impoundments contain waste water and bottom ash from of the coal burning process and are located southeast of the power plant. The CCR impoundments include Ash Pond 2 and Pond 3 and are permitted to dispose of bottom ash.

An area on the west side of a reclaimed ash pond is currently used for settling of bottom ash via a weir system, and for storage of bottom ash that is being sold for beneficial use. Prior to October 2015, bottom ash from both generating units was sluiced in water and transported via pipe to a settling area next to the reclaimed ash pond or to Ash Pond 2. Ash Pond 2 was the primary ash settling pond. The ash was discharged in the southwest corner of the pond.

Ash Pond 2 was partially closed in 2017. Approximately 23 acres in the south and south west sides of the pond were closed in accordance with permit requirements. The existing bottom ash was graded, additional embankment fill consisting of cohesive clays was brought in from the landfill, and the area was capped with a 1.5 feet compacted clay liner, 12" of root zone material, and 6" of suitable plant growth material. The closed Phase 1 of Ash Pond 2 has been seeded with a native grass mixture, mulched, and fertilized with erosion control measures installed. The remainder of the pond complex is scheduled as Phase 2 to be capped and closed in 2019.

Discharge water from sumps inside the plant is currently still sent to the remaining open area of Ash Pond 2, in the northwest corner. A temporary divider dike was constructed in 2017 to divert flows away from the closed area. Once the solids have settled out, decant water then flows to Pond 3 before being returned to the plant, mixed with cooling water, and discharged in accordance with the plant's discharge permit.

Both the divider dike between Ash Pond 2 and Pond 3 and the north dike of Pond 3 were reconstructed in 2012. The top 6 to 8 feet of the dikes were excavated, replaced, and recompacted. The dikes were widened to 20' and regraded to approximate slopes of 3H:1V. Cabled concrete erosion protection was added to the interior slopes between the low and high water operating elevations of the pond. The remaining open area of Ash Pond 2 is incised, has riprap erosion protection, and a slope of approximately 1.5H:1V.

Ash Pond 2 and Pond 3 have open surface areas of approximately 18 and 4.1 acres, respectively, and are separated by an east-west oriented divider dike. The crest of the impoundment dike is at elevation +1694 feet and the toe is at elevation +1676 feet, resulting in an approximate 18 ft structural height. Pond 3 is located directly north of Ash Pond 2. The crest of the impoundment dike for Pond 3 is at elevation +1693 ft and the toe is at elevation +1682 feet resulting in an approximate 11-foot structural height. Ash Pond 2 and Pond 3 are both unlined ponds.

Ash Pond 2 and Pond 3 were constructed in the 1960's and 1970's concurrent to when Units 1 and 2 were constructed and commissioned. The dikes were typically constructed with cohesive soils over the existing surficial deposits of cohesive silty clay soils and slightly organic silts. The materials used to construct the ash pond dikes were excavated from around the pond sites. The materials used in the reconstruction of the dikes were hauled in from the LOS landfill and

dry bottom ash. The material hauled in from the landfill consists of cohesive clays. Construction was completed using standard earthwork compaction equipment and to current compaction standards.

Periodic Inspections

Ash Pond 2 and Pond 3 are periodically inspected by LOS personnel approximately every seven days. The inspection checklists are completed and filed in the operating record. The checklists address visual inspections and any action needed to correct issues.

Upon review of these inspection records, there are no appearances of actual or potential structural weakness nor other conditions that are disrupting or have the potential to disrupt the operation or safety of the impoundment. Occasionally the vegetation needs to be mowed or cleaned up, and the staff gauges do need to be reset.

Annual Inspections

Ash Pond 2 and Pond 3 are periodically and annually inspected by Basin Electric qualified professional engineers. The inspections address signs of distress or malfunction of the impoundment and appurtenant structures. The hydraulic structures passing through the dikes are also inspected for structural integrity and continued safe & reliable operation.

Based on the inspection of Ash Pond 2 and Pond 3 on November 16, 2017 the following points are addressed:

i. There have been no changes in the geometry of the northern Pond 3 dike since the previous annual inspection. The dike between Pond 3 and Ash Pond 2 has been modified slightly by the installation of portable pumps and removal of the drop structure inlet to Pond 3.
ii. Instrumentation for Ash Pond 2 has been removed for decommission of the pond.
iii. Instrumentation for Pond 3 consists of a digital meter in the pumphouse.
iv. The maximum recorded reading of impounded water and CCR in Ash Pond 2 since the previous annual inspection is 1684.4 msl.
v. The maximum recorded reading in Pond 3 is 8' or 1687.00 msl.
vi. The approximate minimum depth of impounded water and CCR in Ash Pond 2 since the previous annual inspection is 12' or 1672.4 msl.

vii. The approximate minimum depth in Pond 3 is 3.3' or 1681.30 msl.

viii. The present depth and elevation of the impounded water and CCR in Ash Pond 2 is approximately 12' at an elevation of 1682 msl.

ix. The present depth and elevation of the impounded water and CCR in Pond 3 is approximately 4' at an elevation of 1682 msl.

x. The storage capacity of Ash Pond 2 at the time of inspection is 496.80 ac-ft.

xi. The storage capacity of Pond 3 at the time of inspection is 49.49 ac-ft.

xii. The approximate volume of impounded water and CCR in Ash Pond 2 at the time of inspection is 46.76 ac-ft.

xiii. The approximate volume of impounded water and CCR in Pond 3 at the time of inspection is 15.59 ac-ft.

xiv. There are no appearances of an actual or potential structural weakness of the impoundment, nor are there any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the ponds and appurtenant structures.

xv. There are no other changes that may affect the stability or operation of the impounding structures since the previous annual inspection.

Certification Statement

I certify that this Surface Impoundment Annual Inspection meets the requirements of 40 CFR §257.83 specifying Inspection requirements for CCR surface impoundments in the *Standards for the Disposal of Coal Combustion Residuals in Landfills and Impoundments.*

Maria Tomac, PE
January 13, 2018