Periodic Structural Stability Assessment

Possum Point Power Station CCR Surface Impoundment: Pond D

Submitted to:

Possum Point Power Station

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Submitted by:

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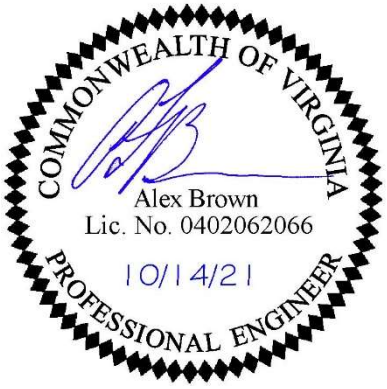
1.0 CERTIFICATION

This Structural Stability Assessment for the Possum Point Power Station's Pond D was prepared by Golder Associates Inc. (Golder). The document and Certification/Statement of Professional Opinion are based on and limited to information that Golder has relied on from Dominion and others, but not independently verified, as well as work products produced by Golder.

On the basis of and subject to the foregoing, it is my professional opinion as a Professional Engineer licensed in the Commonwealth of Virginia that this document has been prepared in accordance with good and accepted engineering practices as exercised by other engineers practicing in the same discipline(s), under similar circumstances, at the same time, and in the same locale. It is my professional opinion that the document was prepared consistent with the requirements in §257.73(d) of the United States Environmental Protection Agency's "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," published in the Federal Register on April 17, 2015, with an effective date of October 19, 2015 [40 CFR §257.73(d)].

The use of the word "Certification" in this document shall be interpreted and construed as a Statement of Professional Opinion and is not and shall not be interpreted or construed as a guarantee, warranty, or legal opinion.

Alex Brown, PE	Senior Project Geotechnical Engineer
Print Name	Title
	10/14/2021
Signature	Date



2.0 INTRODUCTION

This periodic Structural Stability Assessment (Assessment) was prepared for the Possum Point Power Station's (Station) existing Coal Combustion Residuals (CCR) surface impoundment known as Pond D. This Structural Stability Assessment was prepared in accordance with 40 CFR Part §257, Subpart D and is consistent with the requirements of 40 CFR §257.73(d).

The Station, owned and operated by Virginia Electric and Power Company d/b/a Dominion Energy Virginia (Dominion), is located in Prince William County, Virginia, at 19000 Possum Point Road, east of I-95 and West of the Potomac River. The Station includes an existing CCR surface impoundment, Pond D, as defined by the Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule (40 CFR §257; the CCR rule). Pond D is also regulated as a dam by the Virginia Department of Conservation and Recreation (DCR) with Inventory Number 153020 (DCR Dam Permit).

3.0 PURPOSE

This periodic Assessment is prepared pursuant to the requirements in the CCR Rule, § 257.73(d)(1) [40 CFR § 257.73(d)(1)]. The initial Structural Stability Assessment was completed on October 17, 2016, and is required to be updated every five (5) years pursuant to 40 CFR 257.73(f)(3).

4.0 STRUCTURAL STABILITY ASSESSMENT REQUIREMENTS

In accordance with § 257.73(d)(1), the owner or operator of a CCR surface impoundment must conduct periodic structural stability assessments and document whether the design, construction, operation, and maintenance of the CCR surface impoundment is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein. The assessment must, at a minimum, document whether the CCR unit has been designed, constructed, operated, and maintained with:

- Stable foundations and abutments;
- Adequate slope protection to protect against surface erosion, wave action, and adverse effects of sudden drawdown;
- Dikes mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit;
- Vegetated slopes of dikes and surrounding areas not to exceed a height of six inches above the slope of the dike, except for slopes which have an alternate form or forms of slope protection;
- A single spillway or a combination of spillways that is designed, constructed, operated, and maintained to adequately manage flow during and following the peak discharge from the 1,000-year flood;
    - All spillways must be either of non-erodible construction and designed to carry sustained flows or Earth- or grass-lined and designed to carry short-term, infrequent flows at non-erosive velocities where sustained flows are not expected;
- Hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit that maintain structural integrity and are free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the hydraulic structure; and
- For CCR units with downstream slopes which can be inundated by the pool of an adjacent water body, such as a river, stream or lake, downstream slopes that maintain structural stability during low pool of the adjacent water body or sudden drawdown of the adjacent water body.

5.0 STRUCTURAL STABILITY ASSESSMENT

5.1 Foundation and Abutments

Pond D lies in a geologically stable area with no active (Holocene) faults, karst (limestone, dolomite, or marble) potential, or other geologic conditions of concern. Pond D is constructed on natural soils that consist of interbedded clay, clayey sand, and sandy silts of the Potomac Group.

Golder's assessment of embankment stability in the Periodic Safety Factor Assessment (Golder, 2021a) show that Pond D meets the minimum factor of safety requirements in CCR Rule § 257.73(e)(1).

Additionally, Pond D has been routinely inspected and monitored by Station personnel and Dominion personnel in accordance with the requirements in the DCR Dam Permit. Areas of concern have been evaluated by professional engineers with corrective actions proposed and documented.

5.2 Slope Protection

The Pond D dike was built at an upstream embankment slope of 2.5H:1V and a downstream slope of 2.7H:1V with several horizontal benches constructed into the slope at various elevations. The dike is provided with seepage controls in the form of blanket drains that limit the risk of softening of the embankment surface that could make maintenance difficult and/or increase erosion and stability concerns. In addition, the vegetation on the dike is maintained to prevent brush, trees, clumping of weeds, etc. that would concentrate flow and lead to the development of erosion rills.

Dominion performs annual inspections in accordance with the requirements of the DCR Dam Permit with the most recent inspections on June 3, 2020 (Virginia Electric and Power Company, 2020) and April 27, 2021 (Virginia Electric and Power Company, 2021). Dominion evaluates the vegetation on the slopes of the impoundment embankment as part of the annual inspections. The slope vegetation for the upstream slope and downstream slopes of the embankment were observed to be well maintained.

5.3 Compaction of Dikes

The 2016 5-year review of the Pond D embankment by GAI consultants noted the design requirement of an embankment compaction at or exceeding 95% of the maximum dry density (GAI, 2016). GAI also noted that the as-builts for the site indicate these requirements were met for the construction of the embankment.

Inspection logs over the previous 5 years indicate some surficial embankment activity including: shallow sloughing of the upstream slope and toe on May 21, 2018, and various wet and low spots on the downstream slope. According to the inspection reports, these areas appeared surficial in nature and were repaired. A historic seep is located at the west abutment contact, but no changes have been observed at the seep location over the past 5 years. Recently, a seep was identified at the east abutment during the 2021 DCR inspection, and the area will continue to be monitored (Virginia Electric and Power Company, 2021). No indications of weakened embankment (e.g., tension cracks, elevated groundwater, etc.) have been observed at Pond D over the past 5 years.

5.4 Vegetated Slopes

As required by § 257.73(d)(1)(iv), vegetation on slopes and surrounding areas are not to exceed a height of six inches above the slope of the dike. Current operations for Pond D call for grass to be mowed 2-3 times per year to control vegetation height. The vegetated slopes are operated and maintained to be stable and to provide for visual observation of any instability. The 2020 and 2021 annual inspections (Virginia Electric and Power Company, 2020;

Virginia Electric and Power Company, 2021) noted that the upstream and downstream slopes of the embankment have been mowed.

5.5 Spillways

Pond D's principal spillway, a reinforced concrete riser and 30-inch diameter pipe, has been temporarily plugged. The emergency spillway, located on the northwest side of the pond, is available for discharge should water accumulate to the crest of the spillway. The existing emergency spillway is a trapezoidal-shape, broad-crested vegetated spillway that is built into the road surface along the top of the Pond D embankment. It has a width of 70 feet, 10:1 side slopes, and a crest elevation of 144.5 feet above mean sea level (ft amsl). The embankment has an effective depth of 4.5 feet and is surfaced with well-compacted gravel confined by established vegetation. Pond D's inflow design flood control system is capable of adequately managing the inflow from the design flood event without overtopping the embankment and has adequate spillway capacity to manage resulting outflow. The analysis of the spillway capacity is included in Appendix A of the Periodic Inflow Design Flood Control System Plan (Golder, 2021b).

5.6 Hydraulic Structures

The principal spillway and toe drain collection system pass through the dike of Pond D. The principal spillway is a 30-inch diameter pipe connected to a reinforced concrete riser structure that is anchored within the main dike segment. The existing spillway structure is currently plugged. The existing internal drainage controls for the Pond D dike consist of 6-inch toe drains which are maintained. There is no known record or knowledge of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, or debris associated with the principal spillway and toe drain collection systems.

5.7 Adjacent Water Bodies

The Pond D embankment is located approximately 600 feet from Quantico Creek. The toe of the Pond D dam is at an approximate elevation of 40 ft amsl. The 100-year flood event of Quantico Creek reaches an elevation of 8 ft amsl and stops approximately 300 feet away from the toe of the dam (FEMA). Therefore, the flood from the 100-year storm event will not reach the Pond D embankment, thus providing 100-year flood protection to the embankment.

6.0 CORRECTIVE MEASURES

No structural stability deficiencies were identified, so no corrective measures are required.

7.0 CONCLUSIONS

Based on known site conditions, review of available information and the current analyses performed for Pond D, the Pond D surface impoundment design, construction, operations, and maintenance procedures are consistent with good engineering practices for the volume of CCR and CCR wastewater that is impounded and meets the requirements of 40 CFR 257.73(d).

8.0 REFERENCES

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