# INITIAL STRUCTURAL STABILITY ASSESSMENT

**40 CFR 257.73 (d)**

Bottom Ash Pond Complex

Glen Lyn Plant Site

Glen Lyn, Virginia

May, 2026

Prepared for: Appalachian Power Company

Prepared by: American Electric Power Service Corporation

1 Riverside Plaza

Columbus, OH 43215

# Glen Lyn Plant Site

# Bottom Ash Pond Complex

# Initial Structural Stability Assessment

PREPARED BY Dan Murphy Digitally signed by Dan Murphy DN: cn=Dan Murphy, c=US, email=dsmurphy1@aep.com Date: 2026.05.05 08:17:02 -04'00' DATE _____

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Blake Arthur, P.E.

APPROVED BY David Anthony Miller DATE 05.04.2026

David Anthony Miller, P.E.

Director- Ash Management Services


I certify to the best of my knowledge, information, and belief that the information contained in this structural stability assessment meets the requirements of 40 CFR § 257.73(d)

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**Attachment A: Initial Structural Stability Assessment Report**

## 1.0 OBJECTIVE

The "Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments", 89 Fed. Reg. 38950 (May 8, 2024) (amending 40 C.F.R. §257) requires owners and operators of facilities with a legacy coal combustion residual (CCR) surface impoundment to prepare an initial structural stability assessment document for each legacy CCR surface impoundment at the facility.

The Bottom Ash Pond Complex at the Glen Lyn Plant Site is subjected to this rule.

## 2.0 DESCRIPTION OF THE CCR UNIT

The Glen Lyn Plant Site is located adjacent to the New River in Giles County, Virginia, approximately 10 miles east of Princeton, West Virginia. The latitude/longitude of the facility is: 37º 22' 12" N/ 80º 51' 48" W. The facility address is 100 APCO Road, Glen Lyn, VA, 24093. The Bottom Ash Pond Complex is located approximately 500 feet northeast from the Plant site.

The Glen Lyn Plant operated from 1919 to 2015. The Bottom Ash Pond Complex is formed by a perimeter ring dike nearly 2,500 feet long. The Bottom Ash Pond Complex is roughly 7 acres in size. The Bottom Ash Complex contains internal splitter dikes that create 3 internal ponds known as the North Bottom Ash Pond, South Bottom Ash Pond, and the Clearwater Pond.

## 3.0 STRUCTURAL STABILITY ASSESSMENT 257.73(d)

The Initial Structural Stability Assessment was prepared by GAI Consultants, Inc. and is included as Attachment A.

Based on the findings and general assessment in the Initial Structural Stability Assessment, the Glen Lyn Bottom Ash Pond Complex meets the requirements of 40 CFR 257.73 (d).

**ATTACHMENT A**

# Initial Structural Stability Assessment Report

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# Glen Lyn Bottom Ash Pond
# Initial Structural Stability Assessment Report

American Electric Power
Glen Lyn Plant
Giles County, Virginia

GAI Project Number: C121043.12, Task 003

May 2026

AMERICAN ELECTRIC POWER℠

BOUNDLESS ENERGY℠

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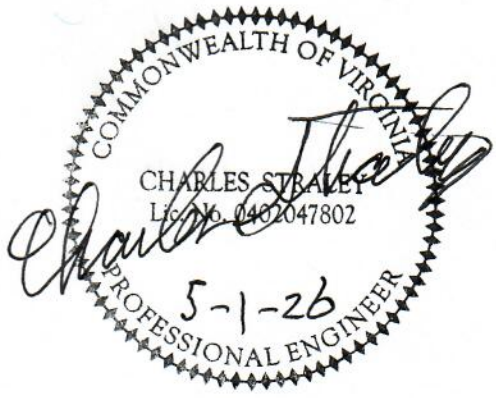
## Certification/Statement of Professional Opinion

The Initial Structural Stability Assessment for the Glen Lyn Bottom Ash Pond was prepared by GAI Consultants, Inc. (GAI). The Assessment Report was based on certain information that, other than for information GAI originally prepared, GAI has relied on, but not independently verified. Therefore, this Certification/Statement of Professional Opinion is limited to the information available to GAI at the time the Assessment Report was written. 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 the Assessment 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, and at the time and in the same locale. It is my professional opinion that the Structural Stability Assessment was prepared consistent with the requirements of the United States Environmental Protection Agency's Federal Coal Combustion Residuals (CCR) Rule 40 CFR § 257.73(d), published in the Federal Register on May 8, 2024 with an effective date of November 4, 2024.

The use of the words "certification" and/or "certify" in this document shall be interpreted and construed as a Statement of Professional Opinion and is not and shall not to be interpreted or construed as a guarantee, warranty or legal opinion.

Charles F. Straley, P.E.
Engineering Director



# 1.0 Purpose

Pursuant to the Federal Coal Combustion Residuals (CCR) Rule 40 CFR § 257.73(d)(1), each CCR impoundment is required to conduct an initial and periodic structural stability assessment to establish whether the CCR unit can safely store the maximum volume of CCR and wastewater.

# 2.0 Introduction

The Glen Lyn Bottom Ash Pond is associated with the Glen Lyn Plant located in Giles County, Virginia (VA). The Bottom Ash Pond is located approximately 500 feet northeast of the Plant site. The Station operated from 1919 to 2015. Ash generated after 2008 was disposed of off-site. The Bottom Ash Pond is not closed and has previously been used for the management, storage, and disposal of CCR. Available historic records indicate that the primary waste managed by the Bottom Ash Pond was bottom ash or cinders.

The Station began operating in 1919 and was acquired by Appalachian Power Company in 1925. In 1919, the first coal-fired generating unit had a capacity of 15 megawatts of electricity. The first coal-fired unit was retired in 1954. In 1920, the second unit was put into service. The third unit was put into service in 1924. In 1927, the fourth unit was put into service. Units 2, 3, and 4 had the capacity to generate 65 megawatts of electricity and were retired in 1971. The fifth unit was put into service in 1944 and had the capacity to generate 95 megawatts of electricity. The sixth unit was put into service in 1957 and had the capacity to generate 240 megawatts of electricity. The fifth and sixth units were retired in 2015 when the plant ceased production.

The Bottom Ash Pond is no longer receiving CCR material. The Bottom Ash Pond received CCR material from the Station between 1963 and 2015. The Bottom Ash Pond has not been closed and is normally dry. It is the intent of AEP to close the Bottom Ash Pond by removal of all CCR material in future efforts, and GAI understands that the Closure Plan for Bottom Ash Pond has been approved. The CCR material generated from the closure of Bottom Ash Pond will be placed in a proposed CCR Landfill.

A visual inspection of the Bottom Ash Pond was also performed on March 3, 2026 as part of structural stability assessment. During the inspection, GAI personnel did not identify any signs of distress or malfunction that would affect the structural condition of the Bottom Ash Pond.

# 3.0 Information Review

GAI Consultants, Inc. (GAI) reviewed the documents listed under the References section, which includes:

- Prior Dam Safety Assessments;
- Design and as-built drawings; and
- Surveys.

The documents were reviewed to determine if the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices.

## 3.1 Stable Foundations

The foundation soils are alluvial deposits. The alluvial soils underlying the embankments/fills are generally sand and gravel. The bedrock underneath the alluvial soil is Hinton Formation and typically described as gray, green, red shale, siltstone and sandstone. The site is located on the southeast flank of the northeast/southwest trending Hurricane Ridge Syncline. The top of bedrock elevation ranges from 1485 to 1488 feet-mean seal level (ft-msl) across the Bottom Ash Pond Complex Site.

Based on historical subsurface investigation, the relative density and description of the foundation materials are adequate for the CCR unit.

## 3.2 Slope Protection

The downstream slope of the north dike that parallels the New River is protected by riprap and transitions to a grass covered slope to the crest of the dike. The remaining downstream and upstream slopes are protected with vegetative cover with some areas of riprap.

The current condition of riprap on the slopes is adequate. The vegetative covered portions of the slopes are vegetated and maintained. Any erosion that may occur is repaired in a timely period.

## 3.3 Dike Compaction

The original embankments are predominantly made from sandy clay, clayey shale or bottom ash covered with soil. The soil cover is 1 to 3 feet thick based on existing boring records. The crest of the original perimeter dike was at elevation 1515 ft-msl and had side slopes of 1.5 horizontal to 1 vertical (1.5H:1V).

In 1962, the crest of the perimeter dike was raised to elevation 1524 ft-msl and pond bottom was established at elevation 1500 ft-msl. The dikes were raised using bottom ash.

In 1976, the pond complex was modified by the creation of internal splitter dikes. The interior slope was flattened to 2H:1V.

In 1996, the crest of the north dike along the New River was lowered to elevation 1515 ft-msl. Clayey soil cover was placed to cap bottom ash that remained in the dike. An inverted filter and riprap buttress was constructed along the downstream toe of the northern dike along the New River.

Recent subsurface investigations through the embankment indicate that the material is stiff and representative of compacted earthen materials.

## 3.4 Vegetated Slopes

The vegetative areas are mowed to facilitate inspections and maintain growth of the vegetative layer and prevent the growth of woody vegetation.

## 3.5 Spillway Capacity

The Bottom Ash Pond has been operated and maintained in accordance with VA Department of Environmental Quality (VDEQ) regulations and is permitted as a dam through the Division of Dam Safety and Floodplain Management of the VA Department of Conservation and Recreation (VDCR). The Bottom Ash Pond was originally constructed in 1957, with effective embankment crests at elevation 1515.0 ft-msl and a maximum storage of approximately 370 acre-ft.

The drainage area to the Bottom Ash Pond is 0.04 square miles. Most of the area is comprised of the Bottom Ash Pond itself, with minimal drainage coming from impervious surfaces. The precipitation data defining the 1,000-year flood event is 6.64-inches of precipitation with a duration of 24-hours. The direct runoff for the 1,000-year storm to the impoundment was calculated to be 9.14 acre-feet. Given a conservative estimate of an elevated initial water surface elevation at the emergency spillway crest, the impoundment would have the capacity to manage the 1,000-year storm.

The 1,000-year storm was routed through the impoundment using the HEC-HMS program (version 4.9) to identify if the impoundment's storage capabilities are compliant with the VDCR dam safety regulations and the Federal CCR Rule. The Impoundment has a peak water surface elevation of 1514.8 ft-msl under 1.000-year conditions. The peak discharge through the spillway structure is approximately 78 cubic feet per second (cfs). The allowable flow through the 30-inch reinforced concrete outlet pipe is over 100 cfs, therefore, the discharge is below the maximum outlet capacity.

## 3.6 Underlying Hydraulic Structures

The Impoundment historically used an embankment to impound and store station process water and wet CCR slurries but is currently considered a legacy surface impoundment. The embankment is set to an elevation of 1515 ft-msl and has a maximum storage capacity of over 370 acre-feet at that elevation. There is one outlet with two control structures that could potentially discharge from the impoundment: the normal pool outlet and the emergency overflow weir.

The normal pool outlet structure consists of a 3-foot 3-inch-wide by 1-foot 5-inch-high rectangular orifice in the side of the reinforced concrete riser structure. The crest is at an elevation of 1502.83 ft-msl. The emergency overflow weir is 3-feet 3-inches wide at an elevation of 1514.83 ft-msl on the riser structure. Both openings discharge into the riser structure, which has a 30-inch reinforced concrete pipe outlet at an elevation of 1501.83 ft-msl. The outlet pipe projects 130 feet through the embankment to discharge at an elevation of 1495.21 ft-msl.

The U5 condenser discharge tunnel is an underlying hydraulic structure conveyed beneath the Bottom Ash Pond and outlets to a channel south of the pond. The visual inspection did not indicate any signs of subsidence or other instability issues for this structure.

## 3.7 Adjacent Water Bodies

The downstream slope of the Bottom Ash Pond embankment is abutted by the East River to the West and the New River to the North. The bank of the New River is lined with riprap and the bank of the East River is adequately wooded; thus, a structural stability analysis with adjacent water bodies was not performed.

# 4.0 Corrective Measures

No deficiencies were detected in the structural stability analysis of the Bottom Ash Pond, and therefore, no corrective measures are recommended at this time.

# 5.0 Conclusion

GAI reviewed previous structural stability analyses and relevant drawings and surveys for this Structural Stability Assessment. Based on the analyses conducted for the conditions outlined in the CCR Rule, the Glen Lyn Bottom Ash Pond design, construction, and operations and maintenance is consistent with good engineering practices for the volume of CCR and wastewater contained in the impoundment.

# 6.0 References

1. GAI Consultants. *Bottom Ash Pond Complex Delineation Data Report*. June 2017.
2. GAI Consultants. *Bottom Ash Pond Complex Delineation Data Report Addendum*. June 2018.
3. GAI Consultants. *Closure Plan – AEP Former Glen Lyn Power Plant Bottom Ash Pond*. Revised December 2024.
4. GAI Consultants. *Coal Combustion Residuals Inflow Design Flood Control System Plan – AEP Bottom Ash Pond*. April 2026.
5. American Electric Power Service Corporation. *History of Construction – Bottom Ash Pond Complex*. February 2026.