INITIAL STRUCTURAL STABILITY ASSESSMENT

40 CFR 257.73 (d)

Bottom Ash Pond Complex

Philo Site

Philo, Ohio

May, 2026

Prepared for: Ohio Franklin Realty

Prepared by: American Electric Power Service Corporation

1 Riverside Plaza

Columbus, OH 43215

Philo 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: 2026.05.06 11:24:29 -04'00' DATE ______________

Dan Murphy, P.E.

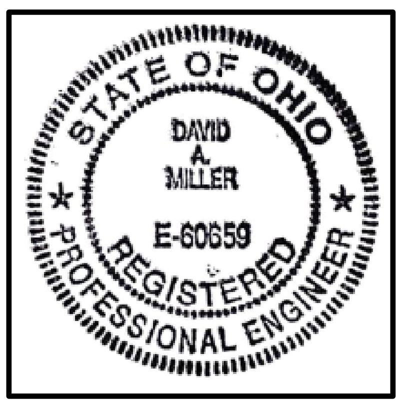
REVIEWED BY Blake Arthur, PE — Digitally signed by Blake Arthur, PE DN: cn=Blake Arthur, PE, c=US, email=barthur@aep.com Date: 2026.05.06 12:44:13 -04'00' DATE ______________

Blake Arthur, P.E.

APPROVED BY David A. Miller DATE 05.04.2026

David A. 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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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 Philo Site is subjected to this rule.

2.0 DESCRIPTION OF THE CCR UNIT

The Former Philo Site is located approximately 0.25 miles east of the Village of Philo, Ohio. The latitude/longitude of the facility is: 39°51'43.69"N/ 81°54'10.97"W. The Philo Plant was placed in service in October 1924 and subsequently retired in 1975.

The Bottom Ash Pond Complex is formed by a 27-foot-tall earthen embankment along the banks of the Muskingum River. The surrounding grades in the areas to the North, West and South of the Bottom Ash Pond Complex were filled in to elevate the site out of the floodplain with a variety of materials for fill.

The embankment is approximately 900 feet long. The downstream slope of the berm varies between 1.6 H:1V to 2H:1V. The interior slopes are approximately 2H:1V. The Bottom Ash Pond Complex encompasses approximately 5 acres.

3.0 STRUCTURAL STABILITY ASSESSMENT 257.73(d)

The Initial Structural Stability Assessment was prepared by S&ME, Inc. and is included as Attachment A.

Based on the findings and general assessment in the Initial Structural Stability Assessment, the Philo Bottom Ash Pond Complex assessment meets the minimum requirements of 40 CFR 257.73 (d). Several recommendations were identified by S&ME. The recommendations for improvements will be addressed by maintenance activities and advancing the site to closure.

ATTACHMENT A

Initial Structural Stability Assessment Report

Philo Legacy CCR Impoundment
Periodic Structural Stability Assessment
Philo Power Plant
Philo, Ohio
S&ME Project No. 25170079

PREPARED FOR:

American Electric Power
1 Riverside Plaza
Columbus, Ohio 43215

PREPARED BY:

S&ME, Inc.
6190 Enterprise Court
Dublin, OH 43016

April 30, 2026

April 30, 2026

American Electric Power
1 Riverside Plaza
Columbus, OH 43215

Attention: Mr. Blake Arthur

Reference: **Periodic Structural Stability Assessment**
Philo Legacy CCR Impoundment
Philo Power Plant (former), Philo, Ohio
S&ME Project No. 25170079

Dear Mr. Arthur:

S&ME, Inc. (S&ME) has completed the Periodic Structural Stability Assessment for the Legacy CCR Impoundment at the former Philo Power Plant in Philo, Ohio. This assessment was performed to fulfill the requirements of the Code of Federal Regulations CFR §257.73 (d). Concurrently with the preparation of this assessment, S&ME prepared the Safety Factor Assessment for this CCR unit, which is referenced in this assessment report. These services were performed in general accordance with S&ME Proposal 25170079 dated April 25. Our services were authorized on May 20, 2025 by issuance of AEP Contract No. 738673.

We appreciate the opportunity to be of service to you for this project. If you have any questions, please feel free to contact us.

Sincerely,

S&ME, Inc.

STATE OF OHIO
DANIEL J. TOBERGTE
E-87825
4/30/26
REGISTERED
PROFESSIONAL ENGINEER

Daniel J. Tobergte, PE
Project Engineer

Jason S. Reeves, PE (TN)
Technical Principal

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1.0 Introduction

1.1 Background

S&ME, Inc. (S&ME) has completed the Periodic Structural Stability Assessment of the coal combustion residuals (CCR) impoundments at the former Philo Power Plant located in Philo, Ohio. This assessment was carried out to fulfill the requirements of the Code of Federal Regulations CFR §257.73 (d), *Periodic Structural Stability Assessments*. Two CCR Units are present at this site including a bottom ash impoundment and a Fly Ash Impoundment. It should be understood that the bottom ash impoundment originally consisted of three separate sub-basins (discussed in Section 1.2.1) and currently stores a nominal amount of CCR material, the capacity of the Fly Ash Impoundment has not yet been reached, and neither of the impoundments store water above the CCR surface (i.e. a water normal pool level does not currently exist within the impoundments).

1.2 Location and Description of CCR Units

The former Philo Power Plant site is located between the east edge of Philo, Ohio and the south and west banks of the Muskingum River as shown in Figure 1-1. The plant was constructed in 1924 and was retired in 1975. The south edge of the site is located along Duncan Falls, a tributary to the Muskingum River. The two CCR impoundments are described in the following paragraphs.

In general, soil fill, presumably sourced from nearby natural borrow soils, was placed across the majority of the complex during construction of the plant to provide a roughly level working area. According to a topographic map developed by the United States Geological Service (USGS) dated 1910 (prior to construction of the plant), the ground surface elevation across the site was roughly El. 680 feet (20-foot contours, NAVD 29). Site topographic information used for this assessment and the Periodic Safety Factor Assessment was obtained from the recent site survey performed by Verdantas on December 21, 2026. The most recent LiDAR survey of the site performed as part of OSIP I was performed in 2007 and references the Ohio State Plane South coordinates, NAD 83 (2011) and NAVD 88. The current ground surface elevations across the site within the CCR impoundments and the surrounding vicinity range from approximate El. 680 feet to 705 feet.

The CCR impoundments do not appear to be included in the Ohio Department of Natural Resources (ODNR) Division of Soil and Water Resources database for dams in the state of Ohio. However, based on the Ohio Dam Classification criteria per the Ohio Revised Code §1501:21-13-01, the embankments would likely classify as Class II dams as the embankment heights are less than 40 feet, the storage for both impoundments is less than 500 acre-feet, and the downstream hazard due to failure appears to be low except that there would be a "release of health hazardous industrial or commercial waste". Additionally, per CFR §257.53, the hazard potential classification of the embankments can be described as "Significant hazard potential CCR surface impoundment" as failure would likely result in no probable loss of human life but could result in environmental damage to the Muskingum River.

Figure 1-1 – Former Philo Plant Site (2020 OGRIP Image)

1.2.1 Bottom Ash Impoundment

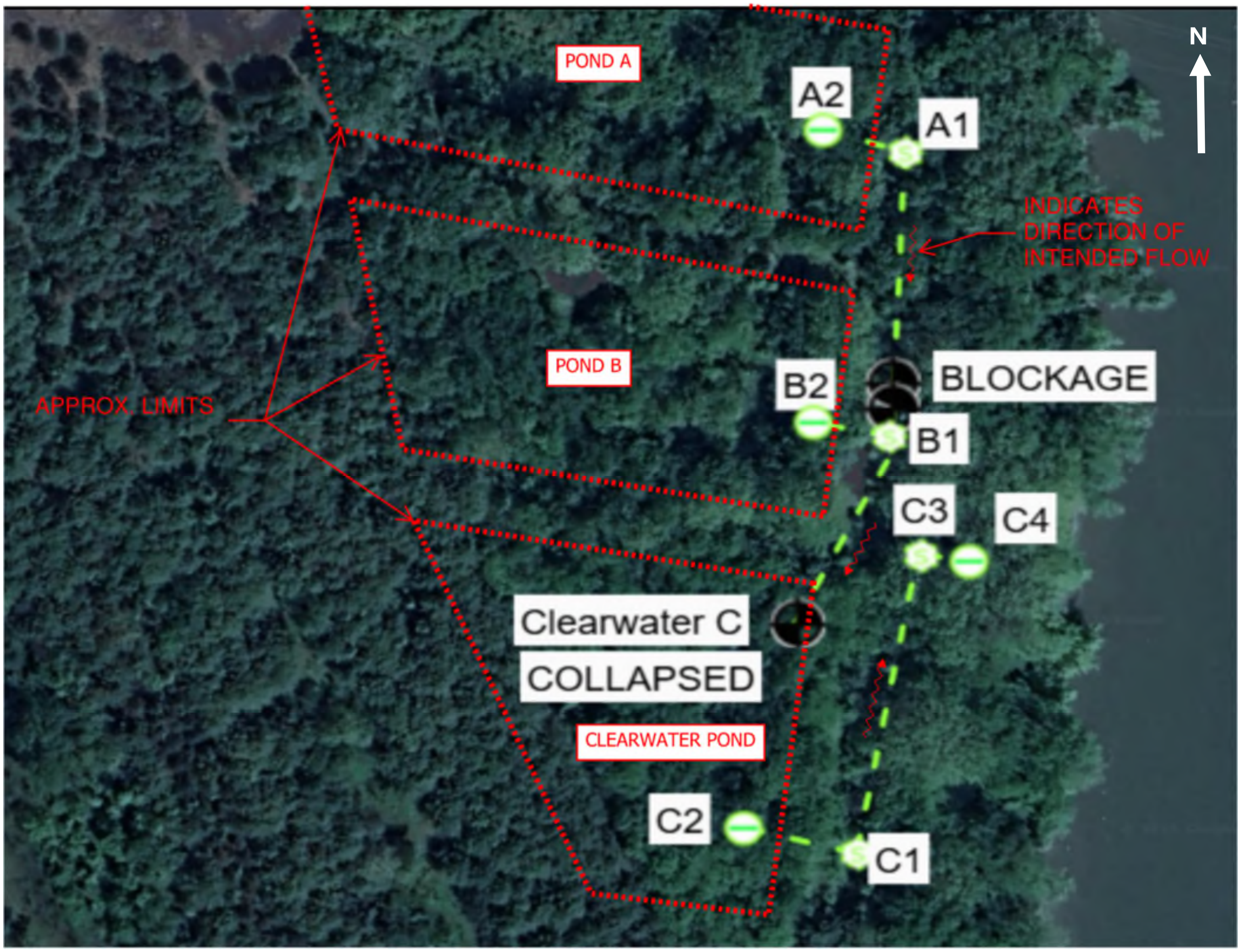
The bottom ash impoundment in its current configuration was put into service in about 1974, is situated southeast of the former plant and south of the existing electrical station, and encompasses an area of approximately 7 acres. The current impoundment was created by the excavation of three basins oriented in-line with each other at a generally north to south direction and divided by separator dikes. The north and middle basins (designated as Ponds A and B, respectively) were reportedly planned for use as settling ponds, and the south basin (designated as Clear Water Pond) was planned for use as a finishing pond.

The ponds were hydraulically connected such that Pond A and Pond B both discharged into the Clear Water Pond in series through bitumen-coated 18-inch corrugated metal pipe (CMP) culverts. The Clear Water Pond drained through a similar 18-inch CMP and transitioned to a 36-inch CMP which then discharged directly to the

Muskingum River (approximate invert El. 679.0 feet according to record drawings). Figure 1-2 shows a conceptual depiction of the configuration of the culvert system, prepared by BloodHound, LLC, the camera inspection subcontractor. The condition of the culverts is further discussed in Sections 4.5 and 4.6.

Flow between the ponds and to the Muskingum River were regulated by outfall structures at the pipe entry points. Excluding the east embankment and west embankment, the ground surface surrounding the impoundment generally remains at about El. 700 feet and increases to El. 705 feet to the north.

Figure 1-2 – Bottom Ash Impoundment Configuration



The three sub-basins (which are currently dry) are contained by an east embankment and west embankment. The east embankment is situated along the banks of the Muskingum River, and the west embankment is located along the former coal storage area pit situated in the middle portion of the plant site. The elevation of the embankment crest ranges from approximately El. 701 feet to El. 702 feet, and the elevation of the bottom of the basins are approximately El. 685 feet for Ponds A and B and El. 683 feet for the Clearwater Pond.

The east embankment is approximately 750 linear feet in length with a height difference of approximately 35 feet between the crest and the bed of the Muskingum River. The height difference is approximately 15 to 20 feet between the embankment crest and the bottom of the basins. The embankment side slopes are inclined at approximately 2H:1V for both the inboard and outboard slopes. The crest width of the east embankment is approximately 40 feet.

The west embankment is approximately 500 feet long with a maximum height difference of approximately 20 feet between the crest and the bottom of the Clear Water Pond (inboard side) and the coal storage pit (outboard side). Side slopes are at inclinations of approximately 2H:1V and 5H:1V for the inboard and outboard slopes, respectively. The crest width of the west embankment is approximately 20 feet. The embankments were constructed primarily of bottom ash fill overlying fill soils which were placed over the natural alluvial soils. It is unknown whether these basins stored CCR material after their construction in approximately 1974 and prior to the plant closure in 1975.

1.2.2 Fly Ash Impoundment

The Fly Ash Impoundment is situated south of the bottom ash impoundment and encompasses the southern limits of the plant site. The northern and western portions of the impoundment were used for storage of "dry" ash and the south portion and east edge of the impoundment were used for fly ash storage, presumably placed using sluicing methods. The date the impoundment was put into service is currently unknown.

The impoundment is approximately 24 acres in size, of which approximately half was used for "dry" ash storage and half was used for fly ash storage. The "dry" ash storage area is bounded by a relatively short rail embankment (less than about 5 feet in height) with a crest elevation of approximately El. 690 feet along the west side and the fly ash storage area to the east and south (ground surface elevation of approximately El. 700 feet. The ground surface gradually increases in elevation towards the east and south to meet the fly ash area. The fly ash storage area is surrounded by an embankment with generally a consistent crest elevation of approximately El. 698 feet to El. 702 feet along the south and east sides and decreases to approximately El. 696 feet within the western portion between the "dry" ash and fly ash storage areas.

The approximate elevation of the ground surface within the bottom of the impoundment is El. 685 feet, which is situated within the western portion of the "dry" ash storage area and within the southern portion of the fly ash storage area. Considering this assessment focuses on the stability of the impoundment, the portions of this report pertaining to the embankments will focus on the east and south embankments (referred to throughout this report as "embankment") as these appear to be the more critical sections of the impoundment.

The embankment is approximately 2,000 linear feet in length with a height difference between the crest and the bed of the Muskingum River of approximately 47 feet. The embankment was constructed primarily of bottom ash with an outboard slope inclination of approximately 2H:1V and an apparent inboard slope inclination of 2H:1V. The width of the crest is approximately 20 feet. According to historical documentation, the south outboard slope (situated along Duncan Run) includes a graded filter with rock protection along the face.

According to the record drawings and other records, the spillway situated near the southeast corner of the impoundment consists of a CMP riser connected to a 24-inch CMP lateral with the discharge end invert at El. 667.0 feet (corresponding to approximately 2 feet above the bed of the Muskingum River). However, the 24-inch CMP discharge was not able to be located during previous site inspections or during our recent site visit.

2.0 Scope

A Periodic Structural Stability Assessment for CCR Surface Impoundments, as defined by Code of Federal Regulations CFR §257.73 (d), is intended to assess whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein. To this end, the assessment requires that the pond design, construction, operation, and maintenance be evaluated for seven specific items of the impoundment, as summarized below:

i. Stable foundations and abutments;
ii. Adequate slope protection to protect against surface erosion, wave action, and adverse effects of sudden drawdown;
iii. Dikes (hereinafter referred to as embankments throughout this report) mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit;
iv. Slope vegetation for embankments and surrounding areas shall not 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;
v. Adequate management of flow during and following peak discharge from the design storm event for the single spillway or spillway configuration (for this impoundment, the 1,000-year flood is considered the design storm event due to the impoundment likely being classified as a "Significant Hazard potential CCR surface impoundment";
vi. Structural integrity is maintained of hydraulic structures underlying the base or passing through the embankment and that these structures are free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the hydraulic structure; and,
vii. Structural stability is maintained for downstream slopes which can be inundated by the pool of an adjacent body of water, such as a river, stream or lake, during low pool or sudden drawdown of the adjacent body of water.

3.0 Information Review and Site Visit

S&ME has completed subsurface investigations and stability analyses of the embankments for these CCR impoundments. Additionally, S&ME has completed the Periodic Safety Factor Assessment, issued under separate cover. In preparation of this Periodic Structural Stability Assessment, S&ME conducted a cursory review of documents relating to the planning of the CCR impoundments and conducted a site visit at the facility.

3.1 Information Review

S&ME has the following documents in our files:

- AEP Dr. No. 16-3925-1, "Bottom Ash Storage Area Existing Topography As Of Fall 1972", Rev. 1, date illegible
- AEP Dr. No. 16-3926-2, "Bottom Ash Storage Area Dikes", Rev. 2, date illegible
- AEP Dr. No. 16-5112-2, "Plant Layout Outfalls to River", Rev. 2, dated November 17, 1971
- AEP internal letter, "Ohio Power Company – Philo Plant – Repairs to Fly Ash Dike", dated January 31, 1972

- Data Gap Investigation report (draft version) prepared by AECOM dated March 2025, provided to S&ME by AEP on July 1, 2025.
- Inflow Design Flood Control System Plans for the Bottom Ash Pond and the Fly Ash Pond have been prepared by AECOM (dated April 17, 2026) and include an H&H analysis based on the 1,000-year storm event. These reports were provided to S&ME by AEP on April 20, 2026.

3.1.1 Bottom Ash Impoundment

According to AEP Dr. No. 16-3925-1, the northern and southern portions of the Bottom Ash Impoundment were used as "bottom ash piles" and "ash pond" areas, respectively, prior to the construction of the current pond configurations. Two drainage culverts, which have since been removed, maintained the water levels within the "Ash Pond". The ground surface elevation within this area ranged from approximately El. 698 feet to 700 feet at that time. Also included in this record drawing are the locations of four "Deepwell Pumphouses" (situated along the present-day east embankment crest) and various former railway tracks.

AEP Dr. No. 16-3926-2 depicts the planned location of the impoundment in its current configuration. Based on the time of construction of the current configuration of the bottom ash impoundment (presumed to be about 1974 and at the plant closure in 1975), it is currently unknown if the existing bottom ash impoundment was placed into service prior to the retirement of the plant.

Based on the AECOM H&H analysis for a 1,000-year storm event, the elevation of the ponded water surface will reach approximately El. 687 feet to El. 688 feet within Pond A and Pond B,and approximately El. 686 feet within the Clearwater Pond (corresponding to a depth of ponded water of approximately 3 feet and a freeboard of approximately 14 to 15 feet). For this analysis, the drainage structures for these sub-ponds and the outlet spillway were assumed to be non-functioning.

3.1.2 Fly Ash Impoundment

AEP Dr. No. 16-5112-2 indicates that the Fly Ash Pond was in operation at the time of the record drawing (1971) including a spillway located at the southeast corner of the pond; however, further details were not included in the record drawing. The general layout of the edges of the pond appears to generally match the configuration of the existing embankment.

An AEP internal letter dated January 31, 1972 documented the existence of overflow pipes through the south embankment of the Fly Ash Impoundment. The letter recommended that the existing pipes be "blocked off and abandoned" along with construction of a graded filter and stability berm along the outboard slope. The graded filter was shown as consisting of coarse compacted sand and gravel, and the stability berm was shown as consisting of coarse pervious rockfill at a 2H:1V slope inclination. The letter indicated that the normal discharge overflow situated at the southeast end of the pond was to be used as the sole discharge for the pond. The letter also suggested that the normal discharge was through a 24-inch CMP culvert with a discharge end invert at El. 667.0 feet.

Based on the AECOM H&H analysis for a 1,000-year storm event, the elevation of the ponded water surface will reach approximately El. 689 feet within the "dry" ash storage area and El. 692 feet in the fly ash storage area. This elevation corresponds to a ponded water depth of approximately 5 feet within the "dry" ash storage area (calculated to be 0.1 feet of freeboard along the west embankment in the AECOM report), and a ponded water depth of approximately 5 feet within the fly ash storage area with a freeboard of approximately 6 feet situated along the divider dike between the "dry" ash and fly ash storage areas. For the analysis, the outlet spillway situated at the southeast corner of the fly ash impoundment area was assumed to be non-functioning.

3.2 Site Visit

On July 7, 2025, Mr. Mike Rowland, Mr. Jason Reeves, and Mr. Dan Tobergte of S&ME met with Mr. Blake Arthur, Mr. Dan Murphy, and Mr. Dave Fry of AEP at the former Philo Plant and conducted a site visit at the CCR impoundments. The group walked the length of the embankments and inspected/assessed the features per the requirements of CFR §257.73 (d).

At the time of the site visit, the majority of the entire site (including beyond the limits of the CCR impoundments) had been cleared of a significant amount of woody vegetation, and mulching was nearing completion. Dense vegetation including relatively closely-spaced mature trees were present along the entire outboard slopes of the embankments. Also, at the time of our site visit, AECOM was installing groundwater monitoring wells at the site.

The "Deepwell Pumphouses" located along the crest of the embankment for the Bottom Ash Impoundment had been located by AEP and had been partially exposed. S&ME understands that AEP is currently planning on adequately closing/abandoning these deepwells and housing structures.

The surface of the embankments generally appeared to be in good condition with no obvious indication of sinkholes, differential settlement, sloughing, or erosion. The outfall structures managing the flow discharge from the Bottom Ash Ponds appeared to be intact with no obvious tilting of the structures. The metal plates which were presumably placed above the stop logs showed signs of deterioration but did not appear to affect the integrity of the structures.

The spillway riser situated at the southeast corner of the Fly Ash Impoundment appeared to be intact with no obvious tilting; however the spillway discharge end along the outboard slope was not encountered during our site visit.

On September 19, 20, and 21, 2025 and on March 30, 2026, camera inspections of the drain pipes were performed for both impoundments; however, a portion of the spillway lateral pipe for the Bottom Ash Impoundment and the lower portion of the spillway riser and the entire lateral pipe for the Fly Ash Impoundment were not accessible to the camera equipment. Please refer to Section 4.6 of this report for further information.

A summary of the observations made during both site visits are included in the following section.

4.0 Assessments

The remainder of this report addresses each of the seven items identified in CFR §257.73 (d), *Periodic Structural Stability Assessments*. In several cases, the results of the concurrently performed Periodic Safety Factor Assessment are referenced.

4.1 Stable Foundations and Abutments

Prior to construction of the impoundments, approximately 6 to 25 feet of soil fill was placed over the entire site. Based on historical topographic maps (USGS, 1910), it appears that this fill formed the base of the CCR impoundments at the site.

Based on recently performed soil test borings, the soil fill consisted of cohesive materials classified as lean clay (CL) and granular materials classified as silty sand (SM), poorly graded sand (SP), and sandy silt (ML) according to the Unified Soil Classification System (USCS). Pocket penetrometer measurements performed on split-spoon samples of the cohesive soils ranged from less than 0.25 tsf to 3.0 tons per square foot (tsf) with an average of about 1.5 tsf.

Field SPT N-values (uncorrected) for both cohesive and granular fill soils ranged from “weight-of-hammer” resistance to 53 blows per foot (bpf). The SPT N-values (corrected for 60% energy, drill rod length, diameter of borehole, and the use of split-spoon without liners) for these soils ranged from 0 to 81 bpf with an average of about 12 bpf. The cohesive fill materials exhibited very soft to soft consistencies and the granular fill materials exhibited very loose to medium dense relative densities.

The fill material was placed on natural alluvial soils overlying weathered sandstone. These natural alluvial soils consisted predominantly of poorly graded sand (SP) and well graded sand (SP) with varying amounts of silt and gravel size particles. Well graded gravel (GW) was encountered on occasion, as well as cohesive soils consisting of lean clay (CL), silty clay (CL-ML) and silt with clay (ML).

Field SPT N-values (uncorrected) for both the granular and cohesive alluvial soils ranged from 4 to 49 blows per foot (bpf). The SPT N-values (corrected for 60% energy, drill rod length, diameter of borehole, and the use of split-spoon without liners) for these soils ranged from 10 to 79 bpf with an average of 39 bpf, corresponding to a relative densities ranging from medium dense to very dense.

Natural cohesive alluvial soils were generally encountered up to approximately 17 feet beneath the fill material within the southern portion of the embankment along the Fly Ash Impoundment (encountered at the locations of Borings B-02 and B-04 only). These soils ranged in consistency from soft to firm with hand penetrometer readings ranging from 1.5 to 3.0 tsf with an average of about 2.25 tsf and SPT N-values (corrected as indicated above) ranging from 5 to 6 bpf.

Bedrock encountered beneath the embankments at the boring locations consisted of weathered to slightly weathered sandstone. The bedrock was cored in Boring B-04 (performed by S&ME) to a depth of 20 feet upon encountering refusal conditions. Core recoveries ranged from 92 to 96 percent and RQD values ranged from 0 to 40 percent. Voids and loss of circulation while coring were not encountered.

The stability of the foundation soils to support the embankments was evaluated as part of the Safety Factor Assessment. This evaluation demonstrates that the foundation soils are stable under all load cases evaluated.

4.2 Adequate Slope Protection Against Erosion, Wave Action, and Drawdown

The CCR impoundments at the former Philo Plant do not impound surface water with a normal pool level (i.e. the water surface is below the existing ground surface). Preliminary results of the AECOM H&H analysis suggest that during a 1,000-year storm event, the depth of ponded water has been estimated to be approximately 3 feet and 5 feet for the bottom ash impoundment and fly ash impoundment, respectively. During the time period after the storm event, if a drawdown event occurs, only the near-surface vegetated layer is anticipated to be affected and be repaired by standard erosion control maintenance activities (i.e. replace failed surficial soils and re-establish vegetation).

The ground surface, of which the vast majority had been cleared prior to our site visit, has since been hydroseeded. As such, grassy vegetation will cover the base, inboard slopes, and crests of the impoundments. The outboard slopes of the embankments have relatively steep inclinations of approximately 2H:1V with no clear access to standard clearing/maintenance equipment. Dense vegetation including a significant amount of mature trees have established along these outboard slopes. These materials are expected to prevent a significant amount of erosion during the design storm event.

Considering these conditions, it is our opinion that the embankments have adequate protection against erosion, wave action, and sudden drawdown.

4.3 Dikes Compacted Sufficient to Withstand the Range of Loading Conditions

The embankments for the two CCR impoundments appear to have been constructed after the plant was in operation, as the embankment consists primarily of compacted CCR materials. Based on available historical information, the method of placement for the embankments was not recorded. The recently completed borings indicated field SPT N-values (uncorrected) for the bottom and fly ash ranging from 3 to 38 bpf and "weight-of-hammer" to 77 bpf, respectively. The SPT N-values (corrected for 60% energy, drill rod length, diameter of borehole, and the use of split-spoon without liners) for the bottom ash and fly ash ranged from 4 to 53 bpf and 0 to 117 bpf, respectively, with average corrected N-values of 23 and 48 bpf, respectively.

This wide range of N-values indicates some variability in the compaction of the bottom ash and fly ash materials, and indicates that portions of the CCR fill may not have been placed in a controlled manner and compacted to modern fill placement standards. However, with the exception of isolated zones, the majority of the embankment appears to exhibit an overall stiff consistency and medium dense relative density based on the N-values. In addition, field and laboratory shear strength testing of the soil embankment soils and foundation soils was performed. Accordingly, the ability of the embankments to resist the various load combinations was evaluated as part of the Periodic Safety Factor Assessment, demonstrating that the embankments are stable under all the load cases evaluated. Furthermore, these analyses also suggest that the embankment soils will not liquefy under a credible earthquake scenario based on liquefaction screening analysis. Please refer to the Periodic Safety Factor Assessment for further information.

4.4 Presence of Vegetated Slopes or Other Forms of Protection

At the time of our site visit on July 7, 2025, the majority of the site had been cleared and mulched, aside from the outboard slopes of the embankments situated along the Muskingum River and Duncan Run. Additionally, hydroseeding was in progress within the eastern portion of the site (east of the Bottom Ash Impoundment area). S&ME understands that the entire impoundment areas and the adjacent areas of the site, excluding the outboard slopes, will be hydroseeded with the intention of grassy vegetation being established to prevent surface erosion.

The dense vegetation with mature trees along the outboard slope does provide erosion protection due to the presumed extensive root system across the slope; however, woody vegetation is generally not acceptable for embankment slopes due to the potential for the shrubs/trees to fall over during storm events or due to age/disease thereby disturbing the ground surface along the slope and creating an erosion hazard. Due to the relatively steep nature of the embankments, traditional grass stabilization may require the use of permanent turf reinforcement matting (TRM) and seeding or other methods to increase the erosion resistance of the soils, if the tree vegetation is removed. Given that the impoundments do not hold a normal pool and therefore seepage through the embankment does not normally exist, it is our opinion that the timeframe for the removal of the woody vegetation can occur simultaneously with the construction of the final closure system.

4.5 Spillway Capacity to Manage Flow During and Following Design Flood

As indicated in Section 4.2, the stormwater generated during a 1,000-year storm event (based on the preliminary H&H analysis performed by AECOM) is expected to be retained by the Bottom Ash Impoundment and fly ash storage area of the Fly Ash Impoundment (south and east portions). Overtopping of the ground surface surrounding the impoundments is not anticipated; however little freeboard was estimated based on the H&H evaluation along the west edge of the "dry" ash storage area of the Fly Ash Impoundment. A distinct spillway along the west edge of the Fly Ash Impoundment was not observed during the site visit. S&ME recommends that AEP consider design and construction of a spillway in this area draining stormwater to the west and south to Duncan Run.

The following paragraphs present the condition of the drainage culverts and spillway culverts at the time of our camera inspection on September 19-21, 2025.

4.5.1 Bottom Ash Impoundment

As indicated in Section 1.2.1, Ponds A and B were originally intended to drain into the Clear Water Pond A through an 18-inch bitumen-coated CMP culvert, and the Clear Water Pond discharges to the Muskingum River through an 18-inch bitumen-coated CMP culvert transitioning to a 36-inch CMP spillway.

Based on the current configuration of the drainage system between the ponds, the original system appears to consist of the following: the drainpipe from Pond A meets the drainpipe from Pond B, and the drainpipe from Pond B drains into the Clear Water Pond. Based on the recent camera inspection, the drainpipe between Pond A and Pond B had filled-in and/or collapsed and the drainpipe from Pond B to the Clear Water Pond had collapsed. The discharge end of the drainpipe between Pond B and the Clear Water Pond was not located and is suspected to have been either capped or damaged during the final stages of construction of the Clear Water Pond.

The entry point and discharge end segments of the spillway are intact and in good condition based on the camera inspection; however, the middle segment was inaccessible to the camera due to differences in grade between the pipe inverts and the bottom of the manholes.

In summary, Ponds A and B do not have functioning drain pipes, and the condition of the middle segment of the spillway for the Clear Water Pond is currently unknown. As such, these pipes are considered unsatisfactory to manage flow between ponds and to the discharge end at this time. Further inspection or testing of the spillway may indicate an adequate spillway capacity for the Clear Water Pond. However, ponding of stormwater within the three basins compromising the Bottom Ash Impoundment does not appear to pose an unstable condition to the embankment (refer to the Periodic Safety Factor Assessment report). Stormwater retained in the sub-basins is not expected to overtop the embankments based on the relatively small drainage areas. The H&H evaluation performed by AECOM (April 17, 2026) recommends that the existing spillway and piping network between the ponds be abandoned in place and the existing outfall structure be replaced with a new spillway structure. As the impoundments are currently planned for closure, the need for a spillway system should be re-evaluated at that time.

4.5.2 Fly Ash Impoundment

As indicated in Section 1.2.2, the spillway for the Fly Ash Impoundment consists of a riser with a lateral 24-inch CMP culvert. The lower portion of the riser and the entire lateral pipe was inaccessible to the camera inspection equipment due to buildup of debris inside the riser. Additionally, the discharge end of the lateral has not been located. Historical documentation suggests that the invert elevation of the discharge end is at El. 667.0 feet, which would place the discharge end just above the normal water surface elevation of the Muskingum River. However, a geophysical scan performed by S&ME using electromagnetic (EM) methods suggested that the pipe is situated near the interface between the ash embankment and the soil fill (around El. 677.0 feet). As such, the spillway for the Fly Ash Impoundment is not capable of managing flow. Based on the surface topography of the site per the recent site survey, drainage of the southern portion of the Fly Ash Impoundment is expected to occur to the west and north, thereby draining away from the spillway. As indicated in the report prepared by AECOM (April 17, 2026), the existing spillway is recommended to be abandoned in-place and a new spillway structure be constructed along the west embankment. The need/configuration of a new spillway for the fly ash storage area should be evaluated during the closure plan stage as the H&H evaluation indicates that over 4 feet of freeboard is expected during the design storm event. The new spillway for the fly ash storage area could either be designed to discharge water into the "dry" ash storage area to the north or directly to Duncan Falls / Muskingum River.

4.6 Structural Integrity of Hydraulic Structures Passing Through CCR Unit

4.6.1 Bottom Ash Impoundment

4.6.1.1 Drain Pipes Between Ponds A and B and the Clearwater Pond

As indicated in Section 4.5, the drainpipe between Pond A and Pond B, and the drainpipe between Pond B and the Clear Water Pond within the Bottom Ash Impoundment have become blocked (either crushed or filled-in). At this time, it is unknown whether these pipes were partially abandoned during construction or if the blockage occurred after construction. Aside from these obstructions, the camera inspection indicated intact pipes with no obvious loss of pipe section with some delamination of the bituminous coating within the flow path at the inlets. Rust was occasionally observed along the inside surface of a portion of the drainpipe between Ponds A and B. Indications of sinkholes or settlement within the vicinity of these pipes were not observed during our site visits.

The H&H evaluation performed by AECOM (April 17, 2026) recommends that the existing pipe networks be abandoned in-place. If the topography of the existing bottom ash impoundment area is to remain post-closure, we recommend that the sub-basins be hydraulically connected by either breaching the dividing embankments or providing a functioning pipe network (such as repairing the existing network or installation of new culverts within the dividing embankments).

4.6.1.2 Spillway Pipe Network

The camera inspection of the entrance lateral pipe and the discharge lateral pipe of the spillway pipe network for the Bottom Ash Impoundment indicated no obvious loss of pipe section with some minor delamination of the bituminous coating within the flow path at the inlet of the entrance pipe. These two pipes appear to be structurally intact.

The middle section of the spillway pipe for the Clear Water Pond in the Bottom Ash Impoundment was inaccessible to the camera inspection due to significant differences in elevation between the pipe inverts and bottom of storm vaults; however, the existence of ground surface depressions above the pipe and buildup of sediment at the discharge end (both inside and outside of the pipe) were not present, suggesting that the pipe likely does not pose an immediate hazard at this time. Additionally, based on an audible test (one person speaks at the entrance to the pipe in the clearing pond and another person listens for loudness and clarity of the sound coming out of the discharge end of the pipe), the pipe appears to be open to sound waves suggesting that the pipe is able to permit the passage of stormwater. If this pipe system is intended to be used as the stormwater discharge after the impoundment is closed, S&ME recommends that AEP perform an inspection of the middle pipe to confirm that the pipe does not show indications of significant corrosion/damage or partial obstructions.

4.6.2 *Fly Ash Impoundment*

The spillway riser pipe for the Fly Ash Impoundment is filled with debris and the location of the lateral discharge end has not been identified. As such, the lateral pipe and the lower portion of the riser was unable to be inspected. Based on the site topography per the recent site survey, it appears that stormwater within the Fly Ash Impoundment would drain towards the west and north of the impoundment and away from the spillway riser pipe. As the current pipe is inaccessible for inspection, S&ME recommends that AEP consider abandonment of the existing spillway and divert stormwater to the northwest towards the "dry" ash storage area. Alternatively, the embankment along the south side of the Fly Ash Impoundment could be breached and an open spillway could be constructed, thereby discharging the stormwater within the fly ash storage area of the Fly Ash Impoundment.

4.7 Integrity of Outboard Slopes During External Flood Event

The embankments are situated along the Muskingum River and Duncan Run, a tributary to the Muskingum River. According to the Special Hazard Flood Area (FEMA's National Flood Hazard Layer (NFHL) Viewer website application) of the Muskingum River within the vicinity of the site, the flood level during a 100-year flood is estimated to be between El. 683 feet and El. 684 feet. Although not identified as a 1,000-year storm event, the information from the FEMA website indicates that the surface elevation of the Muskingum River and Duncan Run will likely reach up to approximately 6 to 7 feet below the embankment crest during a 100-year storm event. As such, inundation of a portion of the outboard slope, along with a potential rapid drawdown condition was evaluated in the Periodic Safety Factor Assessment.

HEC-RAS modeling (or similar hydrological modeling) was not included in our scope. As such, a river elevation of El. 684 feet was used in the stability model for evaluation of a rapid drawdown condition with respect to the fine-grained soils comprising the fill and natural soils beneath the CCR material within the southern portion of the embankment. The results are summarized in the Periodic Safety Factor Assessment report.

It should be noted that if the Muskingum River or Duncan Run were to rise up on the embankment during the design storm, it is possible that some surface scouring of the embankment soils may occur which may require repairs to the outboard embankment.

5.0 Certification

Based on our recent site observations and investigation, review of historical records, and previous assessments/investigations records for the CCR impoundments at the former Philo Plant facility, S&ME certifies that this assessment meets the requirements of CFR §257.73 (d) with the exception of those items previously identified as areas of concern or requiring additional evaluation. Based on our assessment, several concerns related to the functionality of the spillway / drainage culverts and long-term erosion resistance of the impoundments exist were identified, including:

1. Fly Ash Impoundment non-functioning spillway,
2. The collapsed/obstructed pipes between the sub-basins of the Bottom Ash Impoundment, and
3. The well-established woody vegetation (shrubs to mature trees) along the outboard face of the embankments.

These items, along with recommendations by S&ME for improvements, were discussed in previous sections of this report.