STRUCTURAL STABILITY ASSESSMENT
PERIODIC 5-YR REVIEW

CFR 257.73(d)

Bottom Ash Complex

John E. Amos Plant

October, 2021

Prepared for : Appalachian Power Company – John E. Amos Plant

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JOHN E. AMOS PLANT
BOTTOM ASH COMPLEX

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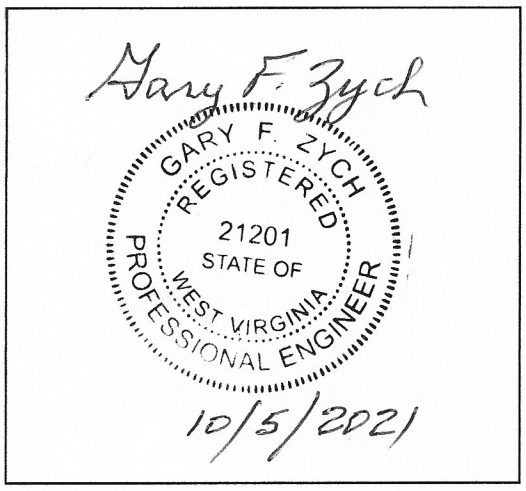

I certify to the best of my knowledge, information and belief that the information contained in this structural stability assessment meets the requirements of 40 CFR 257.73(d)

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1.0 OBJECTIVE 257.73(d)

This report was prepared by AEP- Geotechnical Engineering Services (GES) section to fulfill requirements of CFR 257.73(d) and document whether the design, construction, operations, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices. This is the first periodic 5-year review of the initial assessment as per the Rule.

Note: There has not been any change to the diking structure or discharge structure through the dike system since the initial assessment.

2.0 NAME AND DESCRIPTION OF CCR SURFACE IMPOUNDMENT

The John E. Amos Power Plant is located near Winfield, Putnam County, West Virginia.
It is owned and operated by Appalachian Power Company (APCO). The facility operates one surface impoundment for storing CCR called the Bottom Ash Complex.

The Bottom Ash Complex is comprised of diked embankments on the north, east, and west sides. The south side of the Bottom Ash Complex is incised. There are four main ponds within the Bottom Ash Complex as listed below.

List of Main Ponds within the Bottom Ash Complex
Bottom Ash Pond 1A
Bottom Ash Pond 1B
Reclaim Pond
Treatment/Clearwater Pond

The north dike is approximately 800 feet long and is the highest dike at about 29 feet with a design crest width of 10 feet. The dike is comprised of concrete blocks back-filled with compacted soil that transitions to an earthen embankment. The top of the dike is at elevation 588.0 feet with the natural ground surface beneath the dikes is at about elevation 559 feet.

The north dike is located across a small tributary to Bill's Creek. This portion of Bill's Creek is controlled by the backwaters of the Kanawha River. The side slopes of embankment fill are designed to be 3:H to 1:V that transition to design side slopes 2:H to 1:V.

3.0 STABLE FOUNDATION AND ABUTMENTS 257.73(d)(1)(i)

[Was the facility designed for and constructed on stable foundations and abutments? Describe any foundation improvements required as part of construction.]

Based on the design drawings, a portion of the foundation was constructed on random rock fill within the former channel of Bill's Creek to form a working base for placement of a compacted shale/soil fill. A crushed limestone filter blanket was placed over the upstream face of the rock fill and capped with a clay soil. At a later date, an asphalt stabilization blanket was constructed along the upstream face.

The dike was raised in 2010 using a concrete block wall that transitions to an earthen embankment which in turn transitions to existing ground along the southern portion of the pond complex.

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

4.0 SLOPE PROTECTION 257.73(d)(1)(ii)

[Describe the slope protection measures on the upstream and downstream slopes.]

The downstream slope of the north dike that parallels Bill's Creek is protected with a layer of riprap and transitions to a grass covered slope to the crest of the dike or to the base of the concrete block wall. The remaining downstream and upstream dike slopes are protected with a vegetative cover.

The current condition of the riprap layer is adequate. The remaining sections of the slopes above the riprap is vegetated and maintained. Any erosion that may occur is repaired within a timely period.

5.0 EMBANKMENT CONSTRUCTION 257.73 (d)(1)(iii)

[Describe the specifications for compaction and/or recent boring to give a relative comparison of density.]

Construction specifications for the 2010 dike raising required a QA/QC construction certification plan to ensure that the cohesive soils were placed and compacted in accordance with the design specifications.

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

6.0 VEGETATION CONTROL 257.73 (d)(1)(iv)

[Describe the maintenance plan for vegetative cover.]

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

7.0 SPILLWAY SYSTEM 257.73(d)(1)(v)

[Describe the spillway system and its capacity to pass the Inflow Design Flood as per its Hazard Classification.]

The spillway system consists of a primary weir box and pipe for normal operations and two 36 inch diameter spillway pipes located along the north dike to pass flood events. The CCR unit has a Significant Hazard rating and is designed to safely pass ½ the probable maximum precipitation (PMP) in accordance with the WV DEP dam safety regulations. The ½ PMP is greater than the 1,000 year precipitation event required under 40 CFR 257.73(d)(1)(v).

8.0 BURIED HYDRAULIC STRUCTURES 257.73 (d)(1)(vi)

[Describe the condition of the sections of any hydraulic structure that in buried beneath and/or in the embankment.]

The two 36 inch diameter spillway pipes are constructed through the concrete block wall and extend downslope such that the discharge is directed to the protective rip rap layer. The pipes are encased within a concrete fill as part of the wall construction.

These pipes are corrugated plastic pipes and no deteriotation or shape changes have been observed since the initial assessment.

9.0 SUDDEN DRAWDOWN 257.73 (d)(1)(vii)

[If the downstream slope is susceptible to inundation, discuss the stability due to a sudden drawdown.]

The north downstream slope may be partially inundated by the Kanawha River during extreme flood events. The condition for a sudden drawdown depends on the rate and duration of any given event.

A sudden drawdown scenario was not modeled for the embankment since flooding from the Kanawha River would not create the conditions necessary to be considered as a rapid drawdown event.