

# 2021 CCR Surface Impoundment Structural Stability Assessment



Revision 0  
October 5, 2021  
Issue Purpose: Use  
Project No.: 10572-140

## 1.0 PURPOSE

AES Indiana's Petersburg Generating Station ("Petersburg" or the "Station") has three existing coal combustion residual (CCR) surface impoundments, Ponds A, A', and C, that are regulated by the U.S. Environmental Protection Agency's "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," 40 CFR Part 257 Subpart D, also referred to herein as the Federal CCR Rule. Ponds A and A' are currently being closed in-place in accordance with 40 CFR 257.102(d), and AES Indiana completed closure for Pond C in May 2021. In accordance with 40 CFR 257.73(d)(1), this report documents the 2021 structural stability assessment for Ponds A, A', and C at Petersburg. Pursuant to 40 CFR 257.73(f), this structural stability assessment was conducted and completed within five years of the previous assessment.

## 2.0 STRUCTURAL STABILITY ASSESSMENT RESULTS

To develop the assessment presented herein, a review of the available construction documents, soil borings through the dikes, the annual inspections conducted to date by a third-party, qualified professional engineer in accordance with 40 CFR 257.83(b)(1), and AES Indiana's observations of the dikes has been completed. Pursuant to 40 CFR 257.73(d)(1), the standard for this evaluation is consistent with recognized and generally accepted good engineering practices.

### 2.1 STABLE FOUNDATIONS & ABUTMENTS

#### **Federal CCR Rule Reference: 40 CFR 257.73(d)(1)(i)**

Calculations supporting the Station's Safety Factor Assessment (completed in accordance with 40 CFR 257.73(e)) indicate the soils supporting the exterior dikes of Ponds A and A' will liquefy and are not considered stable under the design seismic load. Slope stability calculations prepared for Pond C's final cover system and supporting fill material indicate that the closed unit is stable and achieves the required factors of safety for static and seismic loading conditions. These same calculations indicate that the final cover systems currently being installed over Ponds A and A' will also be stable and achieve the required factors of safety for static and seismic loading conditions after the ponds are closed.

### 2.2 ADEQUATE SLOPE PROTECTION

#### **Federal CCR Rule Reference: 40 CFR 257.73(d)(1)(ii)**

The slopes of the dikes for Ponds A and A' are adequately protected against surface erosion, wave action, and adverse effects of sudden drawdown. The slopes of Pond C's final cover system are also adequately protected against surface erosion (wave action and sudden drawdown are not applicable to Pond C).

## 2.3 COMPACTED DIKES

### **Federal CCR Rule Reference: 40 CFR 257.73(d)(1)(iii)**

As documented by the Station's Safety Factor Assessment (completed in accordance with 40 CFR 257.73(e)), the dikes for Ponds A and A' are not adequately compacted to provide the required stability factors for the seismic loading conditions. Slope stability calculations prepared for Pond C's final cover system indicate that the structural fill supporting the cap is stable and achieves the required factors of safety for static and seismic loading conditions. These same calculations indicate that the structural fill being placed in Ponds A and A' and compacted to support both ponds' final cover systems will also be stable and achieve the required factors of safety for static and seismic loading conditions when the ponds are closed.

## 2.4 VEGETATED SLOPES

### **Federal CCR Rule Reference: 40 CFR 257.73(d)(1)(iv)**

The requirement that vegetation on slopes of dikes and surrounding areas "not...exceed a height of six inches above the slope of the dike" was vacated by the U.S. Court of Appeals, District of Columbia Circuit after the provision was challenged following publication of the Federal CCR Rule in April 2015. See *USWAG et al. v. EPA*, No. 15-1219 (D.C. Circ. 2015). The U.S. EPA has yet to finalize a rule that re-establishes vegetative cover height limitations for CCR surface impoundments.

## 2.5 SPILLWAY

### **Federal CCR Rule Reference: 40 CFR 257.73(d)(1)(v)**

The closed Pond C does not have a spillway. Ponds A and A' have passive spillway systems that are suitable for the inflow design floods based on the Station's Inflow Design Flood Control System Plan (completed in accordance with 40 CFR 257.82(c)).

## 2.6 HYDRAULIC STRUCTURES

### **Federal CCR Rule Reference: 40 CFR 257.73(d)(1)(vi)**

Based on the annual inspections conducted to date by a third-party, qualified professional engineer in accordance with 40 CFR 257.83(b)(1), the hydraulic structures that pass through and beneath the dikes are in sound condition to the extent they are accessible.

## 2.7 ADJACENT WATER BODIES

### **Federal CCR Rule Reference: 40 CFR 257.73(d)(1)(vii)**

The downstream slopes of the exterior dikes are appropriate for the flooding risks of the adjacent White River.

## 3.0 CORRECTIVE MEASURES

### **Federal CCR Rule Reference: 40 CFR 257.73(d)(2)**

As previously mentioned in Sections 2.1 and 2.3, the exterior dikes of Ponds A and A' are not considered stable under the design seismic load. As required by the 40 CFR 257.73(d)(2), corrective measures shall be implemented as soon as feasible. AES Indiana initiated closure of Pond A in January 2019 and of Pond A' in April 2018 and is in the process installing the final cover systems over both ponds. The final cover system designs for both ponds have been shown to achieve the required factors of safety for static and seismic loading conditions after the ponds are closed. Therefore, this action is considered to be an appropriate corrective measure.

## 4.0 CONCLUSION

This structural stability assessment confirms that the three existing CCR surface impoundments at Petersburg – Pond A and Pond A' – do not have stable foundation conditions or adequately compacted dikes to remain stable under the design seismic event as a result of liquefaction. However, AES Indiana is in the process of closing both ponds in accordance with 40 CFR 257.102(d), which is considered an appropriate corrective measure for the conditions noted. Closure activities for Pond C were completed in May 2021.

## 5.0 CERTIFICATION

### **Federal CCR Rule Reference: 40 CFR 257.73(d)(3)**

I certify that:

- This periodic structural stability assessment was prepared by me or under my direct supervision.
- The work was conducted in accordance with the requirements of 40 CFR 257.73(d).
- I am a registered professional engineer under the laws of the State of Indiana.

Certified By: David E. Nielson

Date: October 5, 2021

Seal:

