2018

J.M. Stuart Station
Ash Pond 3A Annual Inspection

ODNR File No.: 8535-012

Prepared by:
John Hendrix, PE

AES Ohio Generation

Date: December 21, 2018

Purpose

I have conducted the following annual inspection in compliance of the Federal CCR Rule, 40 CFR Part 257 and Ohio Department of Natural Resources ORC 1501.062.

Statement of Qualifications

I am a practicing Civil/Geotechnical Professional Engineer registered in the State of Ohio employed by AES Ohio Generation, LLC. I am experienced in the design, maintenance and operation of earthen dams and impoundments.

Review of Impoundment Documentation [§ 257.83(b)(1)(i)]

Design, History, and Operation of the Facility

Ash Pond 3A is an upland reservoir that was designed by Bowser Mourner and constructed in c1978 under ODNR Permit No. 77-97. A portion of this pond is constructed over the previously closed Pond 3 which was capped with two feet of cohesive material. In 2010-11 a new liner was installed in the bottom consisting of two feet of 10^{-7} clay. The dam is constructed with a solid clay core. A sand curtain drain was installed along the toe of the south dam to alleviate water in Pond 3 below this structure as indicated in DP&L drawing 300-46-1109. The pond has an area of 52.7 acres at the crest, is 26-feet deep and has a volume of 1,257 acre-feet (427 million gallons) to the crest.

The inlets for this pond are five high-density polyethylene (HDPE) pipes entering the pond typically in the southwest corner. Sluice lines are moved as the pond fills with solids. The Maximum Operating Level of this pond is three feet below the crest. The outlet is a concrete structure with removable stop logs to control the level and facilitate dewatering the pond for cleaning. Effluent is conveyed from this structure to Pond 6 through a 30-inch reinforced concrete pipe.

In 2010 after refilling the pond with water, seepage was noted at the toe of the south dam near the western end. The pond was then dewatered and an investigation was conducted which found that the clay liner had been compromised. The liner was reinstalled to the original configuration.

This pond is used for settling wet sluiced fly ash produced from the combustion of coal in the generating units. When the pond nears the intended volume of CCR, flow is transferred to another pond and this pond is dewatered. After dewatering, the ash is excavated and hauled to an onsite ash landfill.

J. M. Stuart Station stopped operating on May 24, 2018; therefore, this impoundment is not expected to receive any more ash or water. This impoundment has been dewatered and a significant amount of the sluiced ash has been moved to on-site landfills.

Periodic Inspections

A thorough review of weekly facility inspections was conducted. Weekly inspections do not indicate any structural weakness or concerns. Previous inspections from Civil Environmental Consultants in 2009 and Ohio Department of Natural Resources Dam Safety Division in 2013 and 2018 were also reviewed.

Previous Structural Assessments

A structural Assessment from BBCM performed in 2010 was reviewed. This assessment included geotechnical borings and analysis. The report on Initial Periodic Structural Stability Assessment Pond 7 J.M. Stuart Electric Generating Station prepared by Haley & Aldrich in 2016 and the 2013 and 2018, 5-year inspection reports by Ohio Department of Natural Resources were also reviewed.

Visual Inspection of Impoundment [§ 257.83(b)(1)(ii)]

The Pond 3A dam is in good structural condition based on the visual inspection. Some items were noted which require maintenance and can be found in Appendix D.

At the time of inspection this pond was dewatered and in the excavation cycle. Approximately 340,000 cubic yards of ash remain in the pond. The owner is currently evaluating options for closure of this CCR Unit.

Changes in Geometry [§ 257.83(b)(2)(i)]

There were no changes to the geometry of the downstream face of the pond dam or other indications of structural weakness.

The dam was breached on the east side to facilitate removal of fly ash from the impoundment. There were no other changes to the upstream face of the dam.

Instrumentation [§ 257.83(b)(2)(ii)]

Pond 3A is equipped with a staff gauge. At the time of inspection, the pond was empty of water and had no reading on the staff gauge. No previous documented readings were available for this instrument.

Structural Weakness [§ 257.83(b)(2)(vi)]

No indication was found of an actual or potential structural weakness of the CCR unit or any existing condition that was disrupting or had the potential to disrupt the operation and safety of the CCR unit and appurtenant structures.

Other Changes [§ 257.83(b)(2)(vii)]

No changes were found to the CCR unit which could affect the stability or operation of the impounding structure since the previous annual inspection.

Visual Inspection of Hydraulic Structures [§ 257.83(b)(1)(iii)]

The hydraulic structures for this pond consist of a vertical concrete structure with removable stop logs (large C channels) with a reinforced concrete pipe passing through the earthen dam. Some minor spalling of concrete of the vertical riser was observed. Spalling is not significant enough to impact structural integrity or serviceability of the structure. No further deterioration since the previous inspection.

No other conduits pass through the impoundment, dam or under the impoundment.

Water and Material Depths and Volumes

[§ 257.83(b)(2)(iii), § 257.83(b)(2)(iv), § 257.83(b)(2)(v)]

Physical Parameters of Impoundment		
Depth of water	<1	Feet
Min. depth of water	0	Feet
Max. depth of water	23	Feet
Elevation of water	N.A.	Feet
Storage Capacity	2,200,000	Cubic Yards, Crest Full Volume
Volume of water	<100	Cubic Yards
Volume of CCR	340,000	Cubic Yards

Appendix A
CCR Rule Requirements for Impoundment Annual Inspections

257.83 (b) Annual i*nspections by a qualified professional engineer.*

(1) If the existing or new CCR surface impoundment or any lateral expansion of the CCR surface impoundment is subject to the periodic structural stability assessment requirements under § 257.73(d) or § 257.74(d), the CCR unit must additionally be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The inspection must, at a minimum, include:

(i) A review of available information regarding the status and condition of the CCR unit, including, but not limited to,
files available in the operating record (*e.g.,* CCR unit design and construction information required by §§ 257.73(c)(1) and 257.74(c)(1),
previous periodic structural stability assessments required under §§ 257.73(d) and 257.74(d),
the results of inspections by a qualified person, and
results of previous annual inspections);

(ii) A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit and appurtenant structures; and

(iii) A visual inspection of any hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit for structural integrity and continued safe and reliable operation.

(2) *Inspection report.* The qualified professional engineer must prepare a report following each inspection that addresses the following:

(i) Any changes in geometry of the impounding structure since the previous annual inspection;

(ii) The location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection;

(iii) The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection;

(iv) The storage capacity of the impounding structure at the time of the inspection;

(v) The approximate volume of the impounded water and CCR at the time of the inspection;

(vi) Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit and appurtenant structures; and

(vii) Any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection.

Appendix B
Reference Documents Reviewed

- Operation Maintenance and Inspection Manual
- Emergency Action Plan
- Structural Analysis
  - Initial Periodic Structural Stability Assessment Pond 3A – Haley & Aldrich 2016
- Previous inspections reports
  - CEC 2009
  - ODNR 2013, 2018
  - CHA 2010
  - BBCM 2010
  - Periodic inspection reports
- DP&L Drawings
  - 300-12-1020
  - 300-12-1020B
  - 300-46-1109
  - 300-46-1158

Appendix C
Inspection Check List

Dam Field Inspection Report

DAM/IMPOUNDMENT ANNUAL FIELD INSPECTION FORM
Unit Name: Pond 3A
Facility Name: J.M. Stuart Station
ODNR File No.: 8535-012 ☒ CCR Unit
ODNR Hazard Classification: ☐ I ☒ II ☐ III ☐ IV ☐ N/A
Impoundment Type: ☐ Incised ☒ Upland ☐ Lake
Description:
Inspection Date(s): November 2018
Weather/Surface Conditions During Inspection: mostly cool and dry.
Freeboard: Pond was dewatered for excavation.

	ACTION			
	NONE	MONITOR	MAINTENANCE	ENGINEER
UPSTREAM SLOPE Gradient: Horizontal: 2.5 Vertical: 1 (est. meas.)				
VEGETATION				
Trees:	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
Brush:	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
Ground Cover:	☒	☐	☐	☐
DESCRIPTION: Grass from top of stone shoreline protection and crest.				
CONDITION: good				
SLOPE PROTECTION	☒	☐	☐	☐
TYPE or NONE: Stone				
DESCRIPTION: Gabion stone generally ranging from 3 inches to 7 inches				
CONDITION: good				
EROSION:	☒	☐	☐	☐
DESCRIPTION AND LOCATION: Some erosion on the slopes below the stone shoreline protection. This would have needed to be regrade prior to filling but there is no intention to refill the pond.				
INSTABILITIES: (SLIDES, CRACKS, BULGES, etc.)				
SLIDES/SLOUGHS:	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
CRACKS:	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
BULGES	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
OTHER	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
OTHER (rodent burrows, ruts, etc.)				
DESCRIPTION AND LOCATION: The dam on the east side of the pond had been breached to facilitate removal of ash from the pond. the breach is approximately 50 feet wide and approximately 12 feet down from the crest.	☒	☐	☐	☐
DESCRIPTION AND LOCATION:	☐	☐	☐	☐
DESCRIPTION AND LOCATION:	☐	☐	☐	☐
DESCRIPTION AND LOCATION:	☐	☐	☐	☐
CREST Length: 6,188 Width: 10' (est. meas.)				
GROUND COVER:	☒	☐	☐	☐
DESCRIPTION: Grass cover on east and south sides. Stone cover on north and west sides.				
CONDITION: North and west sides are in very good condition.				
EROSION	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
INSTABILITIES: (SLIDES, CRACKS, BULGES, etc.)				
CRACKS:	☒	☐	☐	☐

	ACTION			
	NONE	MONITOR	MAINTENANCE	ENGINEER
DESCRIPTION AND LOCATION:				
RUTS	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
POT HOLES:	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
OTHER	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
MONITORING INSTRUMENTATION:	☒	☐	☐	☐
DESCRIPTION: No settlement monuments				
CONDITION:				
ALIGNMENT:				
CONDITION: Visual inspection of dam indicates no deflection horizontally or vertically.	☒	☐	☐	☐
OTHER (rodent burrows, ruts, etc.)				
DESCRIPTION AND LOCATION: The dam on the east side of the pond had been breached to facilitate removal of ash from the pond. the breach is approximately 50 feet wide and approximately 12 feet down from the crest.	☒	☐	☐	☐
DESCRIPTION AND LOCATION:	☐	☐	☐	☐
DESCRIPTION AND LOCATION:	☐	☐	☐	☐
DESCRIPTION AND LOCATION:	☐	☐	☐	☐
DOWNSTREAM SLOPE Gradient: Horizontal: 2.5 Vertical: 1 (est. meas.)				
VEGETATION				
Trees:	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
Brush:	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
Ground Cover:	☒	☐	☐	☐
DESCRIPTION: Grass				
CONDITION: Good				
EROSION	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
INSTABILITIES: (SLIDES, CRACKS, BULGES, etc.)				
SLIDES/SLOUGHS:	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
CRACKS:	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
BULGES	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
OTHER	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
SEEPAGE/WET AREA	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
EMBANKMENT DRAINS:	☒	☐	☐	☐
DESCRIPTION: None present.				
CONDITION:				
MONITORING INSTRUMENTATION:	☒	☐	☐	☐
DESCRIPTION:				

	ACTION			
	NONE	MONITOR	MAINTENANCE	ENGINEER
CONDITION:				
OTHER (rodent burrows, ruts, etc.)				
DESCRIPTION AND LOCATION: The dam on the east side of the pond had been breached to facilitate removal of ash from the pond. the breach is approximately 50 feet wide and approximately 12 feet down from the crest.	☒	☐	☐	☐
DESCRIPTION AND LOCATION:	☐	☐	☐	☐
DESCRIPTION AND LOCATION:	☐	☐	☐	☐
DESCRIPTION AND LOCATION:	☐	☐	☐	☐

HYDRAULIC STRUCTURES

STRUCTURE:

DESCRIPTION: Principle/Emergency Spillway

INLET	☒	☐	☐	☐
DESCRIPTION: Concrete structure with removeable steel channel stop logs used to maintain water level during operation.				
CONDITION: Structure is in good condition with only minor spalling near the water normal operating level. A pump is set up to pump accumulated rainwater to this structure.				
OBSTRUCTION NOTED: (☐ YES ☒ NO) DESCRIBE IF YES:				
CONDUIT	☒	☐	☐	☐
DESCRIPTION: 24 inch reinforced concrete pipe				
CONDITION: Pipe is in good condition with exception of some damage at the end of the pipe potentially caused by excavating equipment.				
SEEPAGE NOTED: (☐ YES ☒ NO) DESCRIBE IF YES:				
OUTLET	☒	☐	☐	☐
DESCRIPTION: Pipe discharges into a pool without significant erosion protection.				
CONDITION: Good				
EROSION NOTED: (☐ YES ☒ NO) DESCRIBE IF YES:				

Appendix D
CCR Unit Maintenance Recommendations

1. No maintenance items are recommended for this impoundment.

Continued Monitoring

1. Monitor erosion on the lower upstream slope (below the normal water line) and crest on south side. Make repairs if pond is to be refilled.