2017

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

ODNR File No.: 8535-012

Prepared by:
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AES Ohio Generation

Date: December 21, 2017

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.

Periodic Inspections

A thorough review of monthly and weekly facility inspections was conducted. Monthly inspections were conducted through September 2015. Weekly inspections were conducted from October 2015 through the present. 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 were also reviewed.

Previous Structural Assessments

A structural Assessment from BBCM performed in 2010 was reviewed. This assessment included geotechnical borings and analysis.

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 400,000 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.

There were no changes to the upstream face of the dam. Rock erosion protection is in place and in good condition.

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	0	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	418,000	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 2009, 2013
  - 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 2017
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: Some small saplings have emerged in the stone shoreline protection. Appear to have been killed with herbicide.				
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 shoeline protection. This will need to be repaired prior to refilling 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:	☒	☐	☐	☐
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. The south side is not uniform, possibly due to excavation activities, and should be regraded prior to refilling.				
EROSION	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
INSTABILITIES: (SLIDES, CRACKS, BULGES, etc.)				
CRACKS:	☒	☐	☐	☐

	ACTION			
	NONE	MONITOR	MAINTENANCE	ENGINEER
DESCRIPTION AND LOCATION:				
RUTS	☐	☒	☐	☐
DESCRIPTION AND LOCATION: Small ruts <6" deep near the southeast corner.				
POT HOLES:	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
OTHER	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
MONITORING INSTRUMENTATION:	☐	☐	☐	☐
DESCRIPTION: No settlemrnt monuments				
CONDITION:				
☐ ALIGNMENT:				
CONDITION: Visual inspection of dam indicates no deflection horizontally or vertically.	☒	☐	☐	☐
OTHER (rodent burrows, ruts, etc.)				
DESCRIPTION AND LOCATION:	☒	☐	☐	☐
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: Grass cover was well maintained on the south and east dam. Grass on the west dam was much improved from prior inspections and needs to be consistantly kept in this condition.				
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:	☒	☐	☐	☐
DESCRIPTION AND LOCATION:	☐	☐	☐	☐
DESCRIPTION AND LOCATION:	☐	☐	☐	☐
DESCRIPTION AND LOCATION:	☐	☐	☐	☐
HYDRAULIC STRUCTURES				
STRUCTURE:				
DESCRIPTION: Principle/Emergency Spillway				
INLET	☒	☐	☐	☐
DESCRIPTION: Concrete structure with removable 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				
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. Ensure that small saplings in the rock shoreline protection of the upstream slope are dead and continue herbicide treatment if not dead.
2. Repair ruts in the crest at the southeast corner and in the access road at the southwest corner.
3. Ensure grass cover is adequately maintained on the west dam.

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.
2. Monitor outlet pipe for potential erosion after pond is returned to operation.