2017

J. M. Stuart Station
Pond 10 Annual Inspection

ODNR File No.: 8535-011
Ohio EPA Permit No.: 06-5901

Prepared by:
John Hendrix, PE

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 10 is a partially-incised, upland reservoir that was constructed in 2001 under ODNR Permit No. 00-291. This pond is used for settling wet sluiced fly ash produced from the combustion of coal in the station generating units. The pond has an area of 28.9 acres at the crest, is 40-feet deep and has a volume of 826 acre-feet to the crest. This pond is periodically drained and the settled fly ash excavated which is then sent to a dry ash landfill. 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. Presently the pond is being dewatered.

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. These periodic inspections do not indicate any structural weakness or concerns.

Previous Structural Assessments

The report on Initial Periodic Structural Stability Assessment Pond 10 J.M. Stuart Electric Generating Station by Haley & Aldrich in 2016 was reviewed as well as, the 2013 ODNR inspection, a 2010 inspection from BBC&M, and annual inspections from previous years.

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

The Pond 10 dam is in good structural condition based on the visual inspection. Maintenance items were noted during the field inspection.

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

There were no changes to the upstream face of the dam. Rock erosion protection is in place and in good condition around the perimeter of the pond. There were no changes to the geometry of the downstream face of the dam pond or other indications of structural weakness. Slopes have no indication of deformation or other indicators of instability.

Instrumentation [§ 257.83(b)(2)(ii)]

These ponds are equipped with a staff gauge mounted on the primary outlet and settlement monuments. Review of data collected from settlement monuments does not indicate settlement or misalignment.

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 structure for this impoundment is in good condition. Much of the outlet piping for this structure is above ground. It was noted in the 2016 inspection that at one location the pipe had moved from the bench on which it originally sat likely due to thermal expansion and contraction of the high-density polyethylene pipe. No further movement of this pipe has occurred.

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	23	Feet
Maximum Depth of water	37	Feet
Minimum Depth of Water	0	Feet
Elevation of water	568	Feet
Storage Capacity	1,330,000	Cubic Yards, Crest Full Volume
Volume of water	20,000	Cubic Yards
Volume of CCR	696,000	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
- Pond Design Manual
- Previous inspections reports
  - Weekly/monthly
  - ODNR 2013, 2009
  - CHA 2010
  - CEC 2009
- Drawings
  - 300-46-1172 (20 sheets)

Appendix C
Inspection Check List

Dam Field Inspection Report

DAM/IMPOUNDMENT ANNUAL FIELD INSPECTION FORM
Unit Name: Pond 10
Facility Name: J.M. Stuart Station
ODNR File No.: 8535-011 ☒ CCR Unit
ODNR Hazard Classification: ☐ I ☒ II ☐ III ☐ IV ☐ N/A
Impoundment Type: ☒ Incised ☒ Upland ☐ Lake
Description: Located on the west side of Landfill along the plant entrance road. This Pond was designed by URS. Embankments are bottom ash core with a clay liner.
Inspection Date(s): December 2017
Weather/Surface Conditions During Inspection: mostly cool and dry.
Freeboard: greater than 15.5 feet

	ACTION			
	NONE	MONITOR	MAINTENANCE	ENGINEER
UPSTREAM SLOPE Gradient: Horizontal: 2.5 Vertical: 1 (est. meas.)				
VEGETATION				
Trees:	☐	☒	☐	☐
DESCRIPTION AND LOCATION: Some trees along the incised bank and in the deposited ash. No trees in the pond dam.				
Brush:	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
Ground Cover:	☐	☒	☐	☐
DESCRIPTION: Grass in most areas with riprap in select areas.				
CONDITION: Good condition on the upper portion of the slope. Some erosion near the bottom of the slope.				
SLOPE PROTECTION	☒	☐	☐	☐
TYPE or NONE: Riprap in select areas				
DESCRIPTION: Riprap, 3"-12"				
CONDITION: Good condition.				
EROSION:	☐	☒	☒	☐
DESCRIPTION AND LOCATION: Some erosion on the lower portion of the slope (well below the normal water line where no vegetation was established). The upper portion of the shoreline is stablized with vegetation or stone.				
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: 3,748' Width: 15' design (est. meas.)				
GROUND COVER:	☒	☐	☐	☐
DESCRIPTION: Dense graded stone (ODOT 304)				
CONDITION: Good				
EROSION	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				

	ACTION			
	NONE	MONITOR	MAINTENANCE	ENGINEER
INSTABILITIES: (SLIDES, CRACKS, BULGES, etc.)				
CRACKS:	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
RUTS	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
POT HOLES:	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
OTHER	☒	☐	☐	☐
DESCRIPTION AND LOCATION:				
MONITORING INSTRUMENTATION:	☒	☐	☐	☐
DESCRIPTION: Staff gauge at the outlet structure, settlement monuments, settlement monuments				
CONDITION: good condition				
☐ ALIGNMENT:				
CONDITION: Review of settlement monument survey 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: Good condition with the exception of an area near station 27 near the top of the slope which appears to be damaged by mowing activity.				
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: Toe drains are provided to control pore pressure within the dam.				
CONDITION: Good, drains are clear.				
MONITORING INSTRUMENTATION:	☒	☐	☐	☐
DESCRIPTION: none				

	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: Good condition.				
OBSTRUCTION NOTED: (☐ YES ☒ NO) DESCRIBE IF YES:				
CONDUIT	☐	☒	☐	☐
DESCRIPTION: One 30 inch HDPE pipe running along the west, south and east sides of pond 3A				
CONDITION: Good condition, no further movement of the HDPE line.				
SEEPAGE NOTED: (☐ YES ☒ NO) DESCRIBE IF YES:				
OUTLET	☒	☐	☐	☐
DESCRIPTION: Discharges into a pool area of Pond 6				
CONDITION: Good condition.				
EROSION NOTED: (☐ YES ☒ NO) DESCRIBE IF YES:				

Appendix D
CCR Unit Maintenance Recommendations

1. Improve grass vegetation on upstream and downstream slopes. Add topsoil and re-seed the damaged area near station 27 during the spring growing season.
2. Prior to refilling repair erosion to the upstream slope.

Continued Monitoring

1. Trees and brush on the ponded CCR material. Ensure that they do not spread to the pond structure.
2. Monitor the above ground outlet piping to ensure that it does not become over-stressed. Expansion and contraction are common causes of failure for HDPE pipe during seasonal temperature swings.