

**2015**

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

ODNR File No.: 8535-012

The Dayton Power & Light Company



2014

**Prepared by:  
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The Dayton Power & Light Company**

**Date: December 21, 2015**

## **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 Engineer registered with the State of Ohio employed by the Dayton Power & Light Company. 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 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 2012 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. Excavation was halted for the season and ash was treated to prevent wind erosion. Little water was present.

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

There were no changes to the geometry of the downstream face of the dam pond 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 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	925,000	Cubic Yards

## Appendix A

# CCR Rule Requirements for Impoundment Annual Inspections

**257.83 (b)** Annual inspections 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
- ❖ Emergence Action Plan
- ❖ Structural Analysis
- ❖ Previous inspections reports
  - CEC 2009
  - ODNR 2009, 2013
  - CHA 2010
  - BBCM 2010
- ❖ 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): December 2015

Weather/Surface Conditions During Inspection: mostly cool and dry.

Freeboard: Pond was dewatered for excavation.

ACTION

NONE	MONITOR	MAINTENANCE	ENGINEER
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**UPSTREAM SLOPE**      Gradient: Horizontal: 2.5    Vertical: 1    (est. meas.)

**VEGETATION**

Trees:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
Brush:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
Ground Cover:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: Grass from top of stone shoreline protection and crest.				
CONDITION: good				

<b>SLOPE PROTECTION</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TYPE or NONE: Stone				
DESCRIPTION: Gabion stone generally ranging from 3 inches to 7 inches				
CONDITION: good				

EROSION:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				

<b>INSTABILITIES: (SLIDES, CRACKS, BULGES, etc.)</b>				
SLIDES/SLOUGHS:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
CRACKS:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
BULGES	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
OTHER	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				

OTHER (rodent burrows, ruts, etc.)				
DESCRIPTION AND LOCATION:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**CREST**      Length: 10'    Width: 14,009.6'    (est. meas.)

GROUND COVER:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: Grass cover on east and south sides. Stone cover on north and west sides.				
CONDITION: Good				

EROSION	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				

<b>INSTABILITIES: (SLIDES, CRACKS, BULGES, etc.)</b>				
CRACKS:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
RUTS	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION: Small ruts <6" deep near the southeast corner. One rut in the				

	ACTION			
	NONE	MONITOR	MAINTENANCE	ENGINEER
access road at the southwest corner				
POT HOLES:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
OTHER	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
MONITORING INSTRUMENTATION:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: No settlement monuments				
CONDITION:				
<input type="checkbox"/> ALIGNMENT:				
CONDITION: Alignment of dam indicates not deflection horizontally or vertically.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OTHER (rodent burrows, ruts, etc.)				
DESCRIPTION AND LOCATION:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DOWNSTREAM SLOPE</b> Gradient: Horizontal: 2.5 Vertical: 1 (est. meas.)				
VEGETATION				
Trees:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION: Several small trees (<1" dia) were present on the west dam mid way down the slope.				
Brush:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
Ground Cover:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: Grass				
CONDITION: Grass cover was well maintained on the south and east dam. Grass on the west dam was too tall and needs to be better maintained.				
EROSION	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
INSTABILITIES: (SLIDES, CRACKS, BULGES, etc.)				
SLIDES/SLOUGHS:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
CRACKS:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
BULGES	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
OTHER	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
SEEPAGE/WET AREA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
EMBANKMENT DRAINS:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: None present.				
CONDITION:				
MONITORING INSTRUMENTATION:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION:				
CONDITION:				
OTHER (rodent burrows, ruts, etc.)				

ACTION

NONE  
 MONITOR  
 MAINTENANCE  
 ENGINEER

DESCRIPTION AND LOCATION: A rodent burrows found near station 33 along side the Pond 10 discharge pipe

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

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. Grout rodent hole discovered near station 33
2. Remove small trees from west downstream slope.
3. Repair ruts in the crest at the southeast corner and in the access road at the southwest corner.
4. Ensure grass cover is adequately maintained on the west dam. Improve access for mowing equipment if needed.

### **Continued Monitoring**

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