

# McElroy's Run Impoundment Coal Combustion Residual Annual Report

Allegheny Energy Supply Company, LLC  
*A FirstEnergy Company*  
Pleasants Power Station  
Pleasants County, West Virginia

GAI Project Number: C150917.01

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## Certification/Statement of Professional Opinion

The Annual Inspection of McElroy's Run Impoundment was performed by GAI Consultants, Inc. (GAI) on Wednesday, December 2, 2015. The Inspection was based on certain information identified in Section 3.0 that GAI has relied on but not independently verified and the visual observations made by GAI personnel at the Site during specific site visits. Therefore this Certification/Statement of Professional Opinion is limited to the information available to GAI at the time the Inspection was performed. On the basis of and subject to the foregoing it is my professional opinion as a Professional Engineer licensed in the State of West Virginia that the Inspection has been performed in accordance with good and accepted engineering practices as exercised by other engineers practicing in the same discipline(s), under similar circumstances and at the time and in the same locale. It is my professional opinion that the Annual Inspection Report was prepared consistent with the requirements of the United States Environmental Protection Agency's "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," published in the Federal Register on April 17, 2015 with an effective date of October 19, 2015.

The use of the words "certification" and/or "certify" in this document shall be interpreted and construed as a Statement of Professional Opinion and is not and shall not to be interpreted or construed as a guarantee, warranty or legal opinion.



Charles F. Straley, P.E., P.S.

A handwritten signature in blue ink that reads "Charles F. Straley". The signature is written over a horizontal line.

## 1.0 Purpose

Pursuant to the Federal Coal Combustion Residuals (CCR) Rule 40 CFR 257.83, each CCR unit is to have an annual inspection and report prepared by a qualified professional engineer. The inspection is to include:

- ▶ A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files in the operating record;
- ▶ A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit; and
- ▶ 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.

The Inspection Report is to include:

- ▶ Any changes in geometry of the impounding structure since the previous annual inspection;
- ▶ The location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection;
- ▶ The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection;
- ▶ The storage capacity of the impounding structure at the time of the inspection;
- ▶ The approximate volume of the impounded water and CCR at the time of the inspection;
- ▶ 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
- ▶ Any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection.

## 2.0 Introduction

The Pleasants Power Station is a coal-fired electric generating station located near the community of Willow Island in Pleasants County, West Virginia (WV). The station consists of two generating units, which are capable of producing 1,300 megawatts of electricity. Coal Combustion Residuals generated at the station (as well as CCRs from the deactivated Willow Island Power Station) are placed in the McElroy's Run CCR Surface Impoundment, which is located approximately one-half mile east-southeast of the station.

According to the West Virginia Title 47 Legislative Rule, Series 34 Dam Safety Rule, the Impoundment has a Hazard Classification of Class I, meaning the failure of the Impoundment may cause loss of human life or major damage to dwellings, buildings, railroads, or important utilities.

A National Pollutant Discharge Elimination System (NPDES) Water Pollution Control Permit (WV 0079171) has been issued to Allegheny Energy Supply, LLC to maintain a solid waste facility in the form of a surface impoundment/dam. The embankment of the Impoundment is constructed of compacted ash and onsite clay soil and has been permitted separately under the West Virginia Dam Safety Regulations by the Office of Water Resources, Certificate of Approval No. 07302, dated February 7, 1978.

The surface Impoundment receives flue gas desulfurization (FGD) scrubber by-product generated at the Power Station, effluent from the recirculation system from Sedimentation Ponds No. 1 and 2 of the adjacent landfill and their underdrains, and waste materials collected primarily as a result of general

house-cleaning maintenance and/or repair at the Pleasants and Willow Island Power Station. The NPDES permit authorizes discharge to the Ohio River in accordance with effluent limitations, monitoring requirements, and other conditions set forth in the permit.

FGD scrubber by-product is pumped to the Impoundment through two eight-inch diameter slurry lines to a valve station near the west end of the Impoundment dam. The slurry can be discharged into the Impoundment from the valve station or directed into a mobile pipeline boom for discharge at various locations in the Impoundment.

The crest of the dam is at elevation (El.) 900 feet, with El. 887 feet as the permitted final level of CCR. The Impoundment area is approximately 253 acres. Two perforated cross-valley foundation underdrain pipes were installed in a trench below the drainage blanket of the downstream slope of the water-impounding embankment as a part of construction. The drains were installed across the flat bottom of the valley about 100 feet upstream of the toe of the Impoundment embankment. The two pipes meet near the center of the valley where they turn and extend to the current toe of the ash disposal embankment. The pipes collect any seepage that enters the drainage blanket, either through the embankment or from the subgrade below the Impoundment embankment. This water is transmitted to Sedimentation Pond No. 1.

The dam was constructed with a concrete discharge tower, which is outfitted with an operational sluice gate at El. 885 feet and a 24-inch square (former sluice gate) opening at El. 890 feet. Discharge from this structure is directed under the dam via a 3,600-foot long 36-inch concrete pipe. Flow from the concrete pipe is conveyed to the principal spillway, which discharges to a channel that leads to McElroy's Run Creek. Currently, the primary discharge from the Impoundment is via a 12-inch siphon with an operating discharge rate of 3,000 gallon per minute. The siphon flow can either be diverted to the plant for makeup water or discharged to an NPDES Outfall through a 14-inch line. The siphon line is the primary operating mechanism for withdrawing water from the Impoundment to maintain a safe water elevation behind the dam. A concrete emergency spillway is located near the west abutment.

### 3.0 Information Review

CCR Rule §257.83(b)(1)(i) states that an inspection includes "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)."

GAI reviewed the following available information prior to performing the inspection:

- ▶ 2015 7-day CCR Inspection Reports;
- ▶ 2015 Annual Dam Safety Inspection;
- ▶ Site record drawings;
- ▶ WVDEP Permit documents; and
- ▶ Results from Structural Condition Assessment of Primary Spillway Pipe and Decant Tower dated February 12, 2015 (Appurtenances Structural Assessment Report).

The reports are listed under the References section. Conversations were held with the Impoundment operators before the inspection to obtain additional information such as operation and maintenance procedures, current state of the Impoundment, and the typical process for the operators' weekly reports.

## 4.0 Visual Inspection

### 4.1 General Information

The inspection was performed on Wednesday December 2, 2015. The weather conditions were cloudy and rainy with temperatures ranging from 35 to 45 degrees Fahrenheit. Arica DiTullio, P.E., Charles Straley, P.E., P.S., Maxwell Wallack, E.I.T, and Trent Muraoka, E.I.T., of GAI performed the inspection.

### 4.2 Inspection Strategy and Route

The GAI team inspected the Impoundment and its facilities by making visual observations, recording site conditions, and talking to plant personnel.

The inspection started at the crest of the embankment along the east abutment. We then proceeded across the crest and the exposed portion of the upstream slope from the right abutment (east) to left abutment (west) and then down the West Collection channel of the adjacent landfill. We then crossed the downstream face of the embankment working our way progressively down the slope toward the toe. We observed the slopes, the piezometers, the access road across the face of the embankment, the discharge ends of the cross-valley drain pipes, and the principal spillway pipe near the toe.

### 4.3 Facility Conditions

The crest of the embankment and the upstream slope were examined and no cracking or slumping, were observed. No visual signs of slope instability were observed. The crest alignment was straight with no visual indication of lateral or vertical movement. A couple of small animal burrows were observed on the downstream face. No cracking or slumping of the downstream slope was observed.

### 4.4 Geometry

Pursuant to §257.83(b)(2)(i), "any changes in the geometry of the impounding structure since the previous annual inspection" are reported.

Based on visual inspection and a review of the design drawings, no changes to the geometry of the Impoundment were observed.

### 4.5 Instrumentation

Pursuant to CFR §257.83(b)(2)(ii), "the location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection" are reported.

Five survey monitoring points were installed in 1997 in the upstream slope of the embankment slightly below the crest near El. 900 feet. These monitoring points serve to monitor both horizontal and vertical movement of the embankment. The monitoring points consist of small diameter aluminum pipes driven into the ground reportedly to a depth of about 30 inches. The most recent readings obtained in March of 2015 indicate the approximate same elevation as historically reported. Horizontal movement of the monuments were also reviewed. The readings do not indicate any significant movement compared to historical data.

The data for the piezometers for the downstream embankment was reviewed in August of 2015. GAI received and reviewed data from that date until the date of the inspection. Water levels measured in the piezometers are well below water levels that would affect the stability of the embankment.

### 4.6 Depth and Elevation of Impounded Water and CCR

Pursuant to CFR §257.83(b)(2)(iii), "the approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection" are reported.

The approximate minimum elevation of the impounded water and CCR was El. 883.2 feet with a depth of water and CCR of 183.2 feet (based on an elevation of approximately 700.0 feet at the upstream toe of the embankment). The approximate maximum elevation of the impounded water and CCR was El. 889.0 feet with a depth of water and CCR of 189.0 feet. The approximate elevation of the impounded water and CCR the day of the inspection was 885.8 feet with a depth of water and CCR of 185.8 feet.

#### **4.7 Storage Capacity**

Pursuant to CFR §257.83(b)(2)(iv), "the storage capacity of the impounding structure at the time of the inspection" is reported.

The approximate storage capacity of the Impoundment at the permitted level of El. 887 feet is approximately 28,000,000 cubic yards (5,800 acre-feet).

#### **4.8 Volume of Impounded Water and CCR**

Pursuant to CFR §257.83(b)(2)(v), "the approximate volume of the impounded water and CCR at the time of the inspection" is reported.

The approximate volume of the impounded CCR and water in the Impoundment at the time of the inspection was 26,251,984 cubic yards.

#### **4.9 Structural Appearance**

Pursuant to CFR §257.83(b)(2)(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" are reported.

Based on visual inspection, the Impoundment appeared to have no structural weaknesses, no existing conditions that are disrupting or that have the potential to disrupt the operation and safety of the CCR unit at the time of inspection.

The Appurtenances Structural Assessment Report was reviewed and based on the observations from the inspections, the professional opinion was that the observed portion of the Spillway Pipe is structurally sound and in good condition.

#### **4.10 Unit Performance**

Pursuant to CFR §257.83(b)(2)(vii), "any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection" are reported.

Based on a visual inspection, there did not appear to be any other changes that would affect the stability or operation of the Impoundment.

### **5.0 Conclusions and Recommendations**

During the December 2, 2015 visual inspection of the Impoundment, GAI did not identify any signs of distress or malfunction that would affect the structural condition of the Impoundment. No releases of CCR were observed during the 2015 inspection.

The following are GAI's recommendations to be completed when weather permits or during normal maintenance activities:

1. Animal burrows are maintenance issues that will be addressed by the Impoundment operator.
2. FirstEnergy has indicated a plan to continue to monitor the Primary Spillway Pipe and Decant Tower for those items referenced in the Appurtenances Structural Assessment Report.

## 6.0 References

- Environmental Protection Agency, *40 CFR Parts 257 and 261, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities*, April 17, 2015.
- FirstEnergy, Federal CCR 7-Day Inspection Form, November 4, 2015.
- FirstEnergy, Federal CCR 7-Day Inspection Form, November 11, 2015.
- FirstEnergy, Federal CCR 7-Day Inspection Form, November 14, 2015.
- FirstEnergy, Federal CCR 7-Day Inspection Form, November 25, 2015.
- Application for Renewal, Solid Waste Permit No. WV0079171, McElroy's Run Disposal Facility, Civil & Environmental Consultants, Inc., February 2007
- Assessment of Dam Safety: Coal Combustion Surface Impoundments, Pleasants Power Station McElroy's Run Dam, CHA, April 2010.
- 2015 Annual Embankment Inspection, GAI Consultants, August 2015.
- Results from Structural Condition Assessment of Principal Spillway Pipe and Decant Tower, GAI Consultants, February 2015.



## **APPENDIX A**

### **Annual Inspection Checklist**

**CCR Surface Impoundment  
Annual Inspection Checklist**

Project Name McElroy's Run Impoundment  
 Project No. C150917.01  
 Inspector Name Arica DiTullio, Charles Straley, Maxwell Wallack, Trent Muraoka  
 Time 10:00 to 14:00

Landfill No. McElroy's Run Impoundment  
 Date 12/2/2015  
 Weather Conditions Cloudy  
 Temperature 35° to 45°

**Review of Available Information (Preamble and 257.83(b)(i))**

	Reviewed
Files in operating record	yes reviewed prior to inspection
Design and construction drawings	yes reviewed prior to inspection
Previous inspection forms	yes reviewed prior to inspection
Previous structural assessments	yes reviewed prior to inspection
Signage	yes reviewed prior to inspection
Status and condition of impoundment	yes reviewed prior to inspection

**Comments:**

**Visual Inspections (Preamble and 257.83)**

**Comments**

Weakness or malfunction of CCR or appurtenant structure?	yes	<input checked="" type="radio"/> no	
Hydraulic structures under base or dike of CCR unit safe and reliable?	<input checked="" type="radio"/> yes	no	
Any changes in geometry?	yes	<input checked="" type="radio"/> no	
Any surface erosion detected? (257.73)	yes	<input checked="" type="radio"/> no	
Vegetated slopes of dikes 6" lower than slope of dike? (257.73)	<input checked="" type="radio"/> yes	no	
Approximate Depth and elevations of impounded water? and of CCR?	min 183.2 feet deep (elevation 883.2 feet)	max 189 feet deep (elevation 889 feet)	present 185.8 feet deep (elevation 885.8 feet)
Impoundment storage capacity (current)?	min see above	max see above	present see above
Approximate Volume of impounded water and CCR?	28,000,000 cu. yds		
Location of instrumentation and max. reading?	26,251,984 cu. yds		
	Upstream slope of embankment slightly below the crest. Most recent readings indicate an approximate same elevation as 2014.		