



Annual Inspection Report

J.C. WEADOCK GENERATING FACILITY

BOTTOM ASH POND

2017 ANNUAL SURFACE IMPOUNDMENT INSPECTION REPORT

Essexville, Michigan

Pursuant to 40 CFR 257.83

Submitted To: Consumers Energy Company
1945 W. Parnall Road
Jackson, MI 49201

Submitted By: Golder Associates Inc.
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Lansing, MI 48906 USA

October 2017

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CERTIFICATION

Professional Engineer Certification Statement [40 CFR 257.83]

I hereby certify that, having reviewed the attached documentation and being familiar with the provisions of Title 40 of the Code of Federal Regulations Section 257.83 (40 CFR Part 257.83), I attest that this Annual Inspection Report is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of 40 CFR Part 257.83.

Golder Associates Inc.

October 12, 2017

Date of Report Certification

Tiffany Johnson, PE

Name

6201049160

Professional Engineer Certification Number

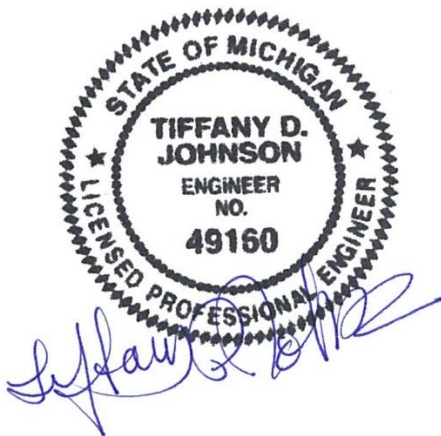




Table of Contents

CERTIFICATION..... C-1
Professional Engineer Certification Statement [40 CFR 257.83]..... C-1
1.0 INTRODUCTION..... 1
2.0 BACKGROUND AND DOCUMENT REVIEW SUMMARY 2
3.0 2017 VISUAL INSPECTION 4
4.0 LIMITATIONS OF ASSESSMENT 6
5.0 CLOSING 7
6.0 REFERENCES..... 8

List of Tables

Table 1 Summary of Background Document Review

List of Appendices

Appendix A Inspection Checklist Form



1.0 INTRODUCTION

On April 17, 2015, the United States Environmental Protection Agency (EPA) issued the Coal Combustion Residual (CCR) Resource Conservation and Recovery Act (RCRA) Rule (40 CFR 257 Subpart D) (“CCR RCRA Rule”). The CCR RCRA Rule requires owners or operators of existing CCR surface impoundments to have those units inspected on an annual basis by a qualified professional engineer (QPE) in accordance with 40 CFR 257.83(b). The annual qualified professional engineer inspections are required to be completed and the results documented in inspection reports (per 40 CFR 257.83(b)(2) for Existing CCR Surface Impoundments. These inspections are focused primarily on the structural stability of the unit and must ensure that the operation and maintenance of the unit is in accordance with recognized and generally accepted good engineering standards. Each inspection must be conducted and certified by a QPE.

Golder Associates Inc. (Golder) was retained by Consumers Energy Company (CEC) to perform the annual inspection of the Bottom Ash Pond at the J.C. Weadock Generating Facility (Site) to document, to the extent reasonable based on the information provided by CEC and the limits of the visual inspection, that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The inspection included the following:

- Review of applicable information regarding the status and condition of the CCR unit
- A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit and appurtenant structures
- A visual inspection of 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



2.0 BACKGROUND AND DOCUMENT REVIEW SUMMARY

J.C. Weadock is located in Essexville, Michigan and is bounded by the Saginaw River to the west and Saginaw Bay to the north. Bottom ash was sluiced from the J.C. Weadock electrical generating Units 7&8 to the Bottom Ash Pond. An elevated trestle and pipe system hydraulically conveys bottom ash and discharges to the north into Area 1 and to the south to Area 2. Stored bottom ash has been removed via mechanical equipment from the ponds as required to maintain storage capacity on a quarterly basis. Water is discharged from the ponds via into an internal ditch that conveys the flow to the Site's permitted National Pollutant Discharge Elimination System (NPDES) outfall. J.C. Weadock Generating Facility and the Bottom Ash Pond are currently being decommissioned.

The applicable available information reviewed for this assessment is summarized in Table 1 below.

Table 1: Summary of Background Document Review

Document	Date	Author
Weekly inspections performed by Consumers Energy Company (CEC)	June 2016 – May 2017	Varying CEC J.C. Weadock Generating Facility Qualified Persons
J.C. Weadock Generating Facility Bottom Ash Pond Structural Stability and Safety Factor Assessment Report (includes inspection information)	October 2016	Golder Associates Inc.
J.C. Weadock Bottom Ash Pond 2015 Initial Annual RCRA CCR Landfill Inspection Report	January 2016	Golder Associates Inc.
J.C. Weadock Ash Disposal Area, Triennial Ash Dike Risk Assessment Report – Spring 2014	December 2014	Barr Engineering Company
J.C. Weadock Ash Disposal Area, 2012 Ash Dike Risk Assessment Final Inspection Report	August 2012	AECOM Technical Services, Inc.
Coal Combustion Waste Impoundment Round 7 - Dam Assessment Report, JC Weadock Fly Ash Dike	April 2011	Dewberry & Davis, LLC, Fairfax, Virginia
J.C. Weadock Revised Closure Plan	December 2011	AECOM Technical Services, Inc.
Surveillance Monitoring Programs (SMPs)	December 2010, Revised 2015	CEC



J.C. Weadock Generating Facility Ash Dike Risk Assessment, Potential Failure Mode Analysis (PFMA) Report	November 2009	AECOM Technical Services, Inc.
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3.0 2017 VISUAL INSPECTION

The 2017 onsite visual inspection of the Bottom Ash Pond was performed by Golder Associates Inc. (Golder) on May 15, 2017. Golder's inspectors, Tiffany Johnson, P.E. and Samantha Fentress, were accompanied by four Consumers Energy Company (CEC) representatives, as follows:

- Mr. George McKenzie, CEC Systems Engineering Department
- Mr. Bradley T. Runkel, CEC Environmental Services Department
- Mr. Harold D. Register, Jr., CEC Environmental Services Department
- Mr. Caleb Batts, CEC Site Environmental Department

The inspection checklist form (see Appendix A) provides both observations and recommendations as a result of the visual inspection and the following information as stipulated in 40 CFR 257.83(b):

- Any changes in geometry of the impounding structure since the previous annual inspection.
 - No changes were observed since the previous inspection.
- Approximate minimum, maximum, and present depth and elevation of the impounded water and Coal Combustion Residuals (CCR) since the previous annual inspection.
 - Approximate minimum: 594.5 and 590 feet above mean sea level (ft-amsl) NAVD88 for Area 1 and 2, respectively.
 - Approximate average: 593.5 and 590.2 ft-amsl NAVD88 for Area 1 and 2, respectively.
 - Approximate maximum: 596.0 and 590.4 ft-amsl NAVD88 for Area 1 and 2, respectively.
 - Current water level: The bottom ash pond was dry at the time of the inspection.
- Any instrumentation in place designed to monitor the structural stability of the Bottom Ash Pond.
 - There is currently no instrumentation in place designed to monitor for the structural stability of the Bottom Ash Pond at J.C. Weadock. At the time of the inspection and report, there are no plans for installation of stability monitoring instrumentation due to the future planned decommissioning of the Bottom Ash Pond.
- Storage capacity of the impounding structure at the time of inspection.
 - The storage capacity in Areas 1 and 2 is 61,800 cubic yards (Golder, 2016)
- Approximate volume of the impounded water and CCR at the time of inspection.
 - Approximate volume of water and CCR in Areas 1 and 2 is 27,700 cubic yards (Golder, 2016)
- Appearances of 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.
 - None were observed



- Any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection.
 - None were observed

The checklist categorizes observed conditions of the impoundment or appurtenant structures as either acceptable, monitor/maintain, investigate, or repair, which are defined as follows:

- **Acceptable:** The condition was visually documented to be acceptable, requiring no action beyond periodic inspection in accordance with the SMP and typical maintenance.
- **Monitor/Maintain:** The condition was visually identified to exhibit the potential for or show existing degeneration that should either be monitored or maintained as detailed in the checklist.
 - Items identified in this category are not considered a deficiency or release as classified under 40 CFR 257.83(b)(5) requiring immediate action by CEC.
- **Investigate:** The limitations of the visual inspection did not allow for an opinion to be made on the condition of the item observed, and Golder recommends additional investigation to categorize the item.
- **Repair:** Golder recommends that items identified with a repair designation exhibited conditions that should initiate measures be taken to rectify the area of concern.
 - No items identified for repair were considered a deficiency or release as classified under 40 CFR 257.83(b)(5) requiring immediate action by CEC.

Based on review of previous inspection reports listed in Table 1, as compared to conditions noted during the inspection, the following changes were observed:

- Tall vegetation is present on the western downstream slopes.
- Minor erosion and rodent burrows were observed in areas along the upstream slopes.
- Erosion was observed under the inlet trestle on northwestern side of the Bottom Ash Pond.



4.0 LIMITATIONS OF ASSESSMENT

Golder has conducted the site inspection and prepared this report for the Bottom Ash Pond at J.C Weadock. The factual data, assessment, interpretations, and recommendations provided herein are based on the results of field observations from site inspections performed by Golder and review of previous site inspection reports provided to Golder by CEC and pertain to the specific project as described in this report and are not applicable to any other project or site location.

Golder has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practicing under similar conditions and has characterized the site conditions within the limitations of the scope of services as defined by CEC and subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied, is made. Any change of site conditions, purpose, development plans, or operation may alter the validity of this report. Golder cannot be responsible for use of this report, or portions thereof, unless Golder is requested to review and, if necessary, revise the report.



5.0 CLOSING

This report has been prepared in general accordance with normally accepted civil engineering practices to fulfill the RCRA reporting requirements in accordance with 40 CFR 257.83(b)(2). Golder has reviewed the available information on the Bottom Ash Pond at J.C. Weadock and performed an onsite visual inspection. Golder's assessment is limited to the information provided by CEC and to the features that could be inspected visually in a safe manner. Golder cannot attest to the condition of subsurface or submerged structures.

GOLDER ASSOCIATES INC.

Handwritten signature of Samantha Fentress in black ink.

Samantha Fentress
Engineer

Handwritten signature of Tiffany D. Johnson in blue ink.

Tiffany D. Johnson, P.E.
Associate



6.0 REFERENCES

Document	Date	Author
Weekly inspections performed by Consumers Energy Company (CEC)	June 2016 – May 2017	Varying CEC J.C. Weadock Generating Facility Qualified Persons
J.C. Weadock Generating Facility Bottom Ash Pond Structural Stability and Safety Factor Assessment Report (includes inspection information)	October 2016	Golder Associates Inc.
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**APPENDIX A
INSPECTION CHECKLIST FORM**

CCR SURFACE IMPOUNDMENT VISUAL INSPECTION CHECKLIST

Facility Name: J.C. Weadock Bottom Ash Pond

Owner: Consumers Energy Company (CEC)

Purpose of Facility: Detention and settlement of sluiced bottom ash.

County, State: Bay County, Michigan

Inspected By: Tiffany Johnson and Samantha Fentress

Inspection Date: May 15, 2017

Weather: Sunny, Clear 65° Fahrenheit

ITEM					REMARKS
	Acceptable	Monitor/Maintain	Investigate	Repair	
1. General Conditions					
a. Year Minimum Water Elevation					Elevation: 594.5 and 590.0 feet NAVD88 for Area 1 and Area 2 (respectively)
b. Year Average Water Elevation					Elevation: 595.3 and 590.2 feet NAVD88 for Area 1 and Area 2 (respectively)
c. Year Maximum Water Elevation					Elevation: 596.0 and 590.4 feet NAVD88 for Area 1 and Area 2 (respectively)
d. Current water level					The bottom ash pond was dry at the time of the inspection.
e. Current storage capacity					Volume: 61,800 CY (see Note 1)
f. Current volume of impounded water and CCR					Volume: 27,700 CY (see Note 1)
g. Alterations	X				None Observed
h. Development of downstream plain	X				None observed
i. Grass cover	X				Crest of bottom ash pond generally bare of vegetation, See 5c below, and maintain erosion and vegetation controls. See Note 2.
j. Settlement/misalignment/cracks	X				None observed
k. Sudden drops in water level?	X				None observed
2. Inflow Structure					
a. Settlement	X				None observed
b. Cracking	X				None observed
c. Corrosion		X			Observed corrosion of steel trestles, continue pipe maintenance procedures. See Note 2.
d. Obstacles in inlet	X				None observed
e. Riprap/erosion control		X			Erosion observed under inlet trestle, maintain erosion control procedures, see note 2.
3. Outflow Structure					
a. Settlement	X				None observed
b. Cracking	X				None observed
c. Corrosion	X				None observed
d. Obstacles in outlet	X				Water appeared to be flowing freely and was not submerged.
e. Riprap/erosion control		X			Maintain erosion controls at outlet of the outflow structure. See Note 2.
f. Seepage	X				None observed
4. Upstream slope					
a. Erosion		X			Minor intermittent erosion noted along slope and sparse vegetation, maintain vegetation and erosion controls. See Note 2.
b. Rodent burrows	X				None observed in this area.
c. Vegetation		X			Minor intermittent erosion noted along slope and sparse vegetation, maintain vegetation and erosion controls. See Note 2.
d. Cracks/settlement	X				None observed
e. Riprap/other erosion protection	X				None observed
f. Slide, Slough, Scarp	X				None observed
5. Crest					
a. Soil condition	X				Predominantly bottom ash.
b. Comparable to width from previous	X				

ITEM		Acceptable	Monitor/Maintain	Investigate	Repair	REMARKS
	inspection					
c.	Vegetation		X			Sparse vegetation, monitor and maintain vegetation controls, see note 2.
d.	Rodent burrows	X				None observed
e.	Exposed to heavy traffic	X				None observed
f.	Damage from vehicles/machinery	X				None observed
6.	Downstream slope					North, west, and east slopes considered downstream.
a.	Erosion		X			Observed erosion around cracked pipe on west side near inlet trestle, and near decomposing tree stumps, maintain erosion controls. See Note 2.
b.	Vegetation		X			Tall vegetation along western slopes, maintain vegetation controls. See Note 2.
c.	Rodent burrows		X			Rodent burrows observed along northern slope, maintain animal control procedures, see note 2.
d.	Slide, Slough, Scarp	X				Minor surficial sloughing observed along the discharge channel north of the Bottom Ash Pond, however this area is outside the limits of the Bottom Ash Pond.
e.	Drain conditions	X				
f.	Seepage	X				None observed
7.	Toe					
a.	Vegetation		X			Intermittent sparse vegetation located along toe, maintain vegetation controls. See Note 2.
b.	Rodent burrows	X				None observed
c.	Settlement	X				None observed
d.	Drainage conditions	X				None observed
e.	Seepage	X				None observed

Notes:

- 1) Current volume of impounded water and CCR for Area 1 and Area 2 is based on an approximate bottom elevation of 588.0 and 582.0 feet (NAVD88) and normal operating level of 594.5 and 590.0 feet (NAVD88), respectively. The unit's storage capacity for Area 1 and Area 2 is based on an approximate pond bottom elevation of 588.0 and 582.0 feet (NAVD88) and elevation 597.0 and 594.7 feet (NAVD88), respectively, which corresponds to 2 feet below the lowest elevation of the exterior berm for each area. Elevations used in this calculation are based off a May 2016 topographic and bathymetric survey completed by Engineering and Environmental Solutions, LLC (EES).
- 2) Features observed and documented in this checklist were not considered a deficiency or release as classified under 40 CFR 257.83(b)(5) and required no immediate action beyond periodic inspection in accordance with the SMP and typical maintenance.
- 3) Golder recommends that items identified with a repair designation exhibited conditions that should initiate measures be taken to rectify the area of concern. It should be noted that no items identified for repair were considered a deficiency or release as classified under 40 CFR 257.83(b)(5) requiring immediate action by CEC.

Name of Engineer: Tiffany Johnson, P.E.

Date: 10-12-17

Engineering Firm: Golder Associates Inc.

Signature:

Established in 1960, Golder Associates is a global, employee-owned organization that helps clients find sustainable solutions to the challenges of finite resources, energy and water supply and management, waste management, urbanization, and climate change. We provide a wide range of independent consulting, design, and construction services in our specialist areas of earth, environment, and energy. By building strong relationships and meeting the needs of clients, our people have created one of the most trusted professional services organizations in the world.

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