Annual Inspection Report

J.C. WEADOCK DRY ASH LANDFILL

DRY ASH LANDFILL

2017 CCR LANDFILL INSPECTION REPORT

Essexville, Michigan

Pursuant to 40 CFR 257.84

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

Submitted By: Golder Associates Inc.
15851 South US 27, Suite 50
Lansing, MI 48906 USA

October 2017 **1772978.0005**

Golder Associates

CERTIFICATION

Professional Engineer Certification Statement [40 CFR 257.84]

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 257.84 (40 CFR Part 257.84), 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 257.84.

Golder Associates Inc.

October 12, 2017

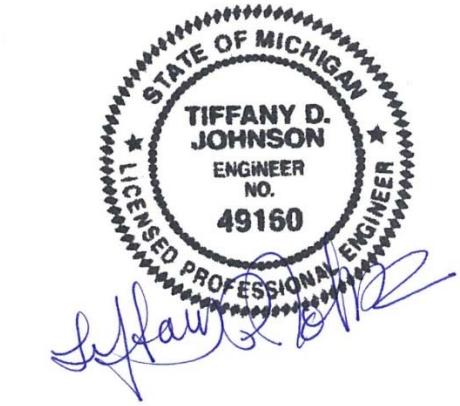
Date of Report Certification

Tiffany D. Johnson, P.E.

Name

6201049160

Professional Engineer Certification Number



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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") to regulate the beneficial use and disposal of CCR materials generated at coal-fired electrical power generating complexes. The CCR Rule requires owners or operators of existing CCR landfills to have those units inspected on an annual basis by a qualified professional engineer in accordance with 40 CFR 257.84(b). The annual qualified professional engineer inspections are required to be completed and the results documented in an inspection report.

Golder Associates Inc. (Golder) was retained by Consumers Energy Company (CEC) to perform the annual inspection of the Dry Ash Landfill (Landfill) at the J.C. Weadock Generating Facility (JC Weadock). The intent of the inspection is to document, to the extent reasonable based on 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. Golder reviewed available information regarding the status and condition of the CCR unit and performed a visual onsite inspection to identify signs of distress or malfunction of the CCR unit. The inspection included the following:

- Any changes in geometry of the structure since the previous annual inspection.
- Approximate volume of CCR contained in the unit at the time of inspection.
- 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.
- Any other change(s) which may have affected the stability or operation of the Landfill since the previous inspection.

2.0 BACKGROUND AND DOCUMENT REVIEW SUMMARY

JC Weadock is located in Essexville, Michigan and is bounded by the Saginaw River to the west and Saginaw Bay to the north. The Landfill serves as the facility's primary disposal of dry ash and consists of two fill areas, the West Fill Area and East Fill Area, as depicted on the 2011 Final Closure plans by AECOM. Dry ash is blown to a silo and conditioned to a desired moisture content to prevent fugitive dust and to aid in compaction. The dry ash from the silos is then trucked from the D.E. Karn facility and placed in active areas of the JC Weadock Dry Ash Landfill.

In 2008, a soil bentonite slurry wall was constructed within the perimeter clay dike of the landfill and keyed into the underlying hydraulically confining glacial clay till layer.

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 Inspection Reports	June 2016 – May 2017	Varying CEC J.C. Weadock Generating Facility Qualified Persons
J.C. Weadock Dry Ash Landfill 2016 Annual RCRA CCR Landfill Inspection Report	October 2016	Golder Associates Inc.
J.C. Weadock Dry Ash Landfill 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.

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

Provided in Appendix A is the inspection checklist form that provides both observations and recommendations as a result of the visual inspection and the following information as stipulated in 40 CFR 257.84(b):

- Any changes in geometry of the structure since the previous annual inspection.
  - None were observed
- Approximate volume of Coal Combustion Residuals (CCR) at the time of inspection
  - The volume of CCR at the time of inspection was approximately 0 .56 million cubic yards based on information from CEC.
- 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
  - None were observed
- Any other change(s) which may have affected the stability or operation of the impounding structure since the previous 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 257.84(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.

- It should be noted that no items identified for repair were considered a deficiency or release as classified under 40 CFR 257.84(b)(5) requiring immediate action by CEC.

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

- Historic rodent burrows and erosion has been filled in with and extensive areas of riprap and gravel along the southern and northern slopes; however, Golder observed additional rodent burrows along the northern, eastern and southern slopes.
- Rip rap and other erosion protection should be installed on the northern downstream slope near the discharge channel.

4.0 CLOSING

This report has been prepared in general accordance with normally accepted civil engineering practices to fulfill the Resource Conservation and Recovery Act (RCRA) reporting requirements in accordance with 40 CFR 257.84(b)(2). Golder has reviewed the available information on the JC Weadock Dry Ash Landfill and performed an onsite visual inspection. Golder's assessment is limited to the information provided by CEC and to the aspects that could be inspected visually in a safe manner. Golder cannot attest to the condition of subsurface or submerged structures.

GOLDER ASSOCIATES INC.

Samantha Fentress
Engineer

Tiffany D. Johnson, P.E.
Associate

5.0 REFERENCES

Document	Date	Author
Weekly Inspection Reports	June 2016 – May 2017	Varying CEC J.C. Weadock Generating Facility Qualified Persons
J.C. Weadock Dry Ash Landfill 2016 Annual RCRA CCR Landfill Inspection Report	October 2016	Golder Associates Inc.
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APPENDIX A
INSPECTION CHECKLIST FORM

CCR LANDFILL VISUAL INSPECTION CHECKLIST

Facility Name: J.C. Weadock Dry Ash Landfill

Owner: Consumers Energy Company (CEC)

Purpose of Facility: Dry Ash Disposal

County, State: Bay County, Michigan

Inspected By: Tiffany Johnson and Samantha Fentress ***Inspection Date: May 15, 2017***

Weather: Cloudy, 65-degrees F

ITEM	Acceptable	Monitor/Maintain	Investigate	Repair	REMARKS
1. General Conditions					
a. Current volume of CCR					Volume: 560,000 CY (See Note 1)
b. Alterations	X				
c. Grass cover		X			Areas of bare vegetation on discharge channel side and southern slopes, maintain vegetation controls, see note 2.
d. Settlement/misalignment/cracks	X				
e. Leachate Collection					NA – No leachate collection system exists.
2. Landfill Slope					
a. Erosion – liner exposed		X			Minor erosion observed on northern and eastern slopes, maintain erosion controls, see note 2.
b. Rodent burrows		X			Several large animal burrows observed along north, northeast, and east sides of the landfill perimeter slopes, maintain animal control procedures. See Note 2.
c. Vegetation		X			Along the northern side slope, near the end of the discharge channel, there were areas of vegetation in the riprap, maintain vegetation controls. See Note 2.
d. Cracks/settlement		X			Observed deterioration of a stump along north slope, maintain erosion and vegetation controls. See Note 2.
e. Riprap/other erosion protection		X			Riprap is sparse along northern slopes along the discharge channel, maintain erosion control procedures, see note 2.
f. Slide, Slough, Scarp		X			Minor sloughing observed along north slope, no signs of movement since previous inspection. See Note 2.
g. Benches	X				
h. Final Cover	X				Grassed areas exist on the southern half of the eastern side of the landfill, these areas are inactive.
i. Downchutes	X				Downchutes on eastern portion of the landfill were observed and in good condition.
3. Crest					
a. Soil condition	X				
b. Comparable to design width or previous inspection	X				No changes observed.
c. Vegetation	X				None observed.
d. Rodent burrows		X			Observed several animal burrows on southern and eastern sides of the crest, maintain animal control procedures. See Note 2.
e. Exposed to heavy traffic	X				Exposed to heavy traffic, but no observed damage.
f. Damage from vehicles/machinery	X				
4. Toe					
a. Vegetation	X				
b. Rodent burrows	X				
c. Settlement	X				
d. Drainage conditions	X				
e. Seepage	X				

Notes:

1) The base of the permitted portion of the landfill is assumed to be near the embankment crest at approximately elevation 590 ft., and the Revised Closure Plan (AECOM, 2011) indicates the expansion will raise the fill by a maximum of 58.6 ft. Based on information provided by CEC at the time of the inspection, it is estimated that approximately 10,640,000 cubic yards airspace remains from the 11,200,000 cubic yard of airspace permitted. The resulting utilized airspace and CCR volume is 560,000 cubic yards.

2) Features observed and documented in this checklist were not considered a deficiency or release as classified under 40 CFR 257.84(b)(5) and required no immediate action beyond periodic inspection in accordance with the SMP and typical maintenance.

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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