



Annual Inspection Report

J.H. CAMPBELL GENERATING FACILITY

DRY ASH LANDFILL ANNUAL INSPECTION REPORT

West Olive, 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

1772978.0002





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





Table of Contents

CERTIFICATION..... 1
 Professional Engineer Certification Statement [40 CFR 257.84]..... 1
 1.0 INTRODUCTION..... 1
 2.0 BACKGROUND AND DOCUMENT REVIEW SUMMARY 2
 3.0 2017 VISUAL INSPECTION 4
 4.0 CLOSING 6
 5.0 REFERENCES..... 7

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 landfills to have those units inspected on an annual basis by a qualified professional engineer (QPE) in accordance with 40 CFR 257.84(b). The annual QPE inspections are required to be completed and the results documented in inspection reports per CFR 257.84(b)(2) for landfills.

Golder Associates Inc. (Golder) was retained by Consumers Energy Company (CEC) to perform the QPE annual inspection of the Dry Ash Landfill at the J.H. Campbell Generating Facility (JH Campbell) 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 for 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 an onsite visual inspection to identify signs of distress or malfunction of the CCR unit and visible leachate collection system features.



2.0 BACKGROUND AND DOCUMENT REVIEW SUMMARY

The Dry Ash Landfill serves as the facility's primary disposal area for dry ash and currently consists of four dual lined landfill cells and two leachate storage ponds. Total permitted capacity of the landfill is 9,380,000 cubic yards (cys) with approximately 4,614,000 cys consumed as of July 5, 2017, per survey information provided by Consumers Energy Company (CEC) and airspace evaluation completed by Engineering & Environmental Solutions, LLC. It should be noted that the total permitted volume capacity will be achieved once the seven permitted cells have been constructed and filled.

At the time of the 2017 inspection; Cells 1, 2, 3, and 4 had been constructed with active filling occurring in uncapped portions of Cell 3 and in Cell 4. A final cover system was in place on the eastern portion of Cell 3, the north and east slopes of Cell 2, and the north and west slope of Cell 1.

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

Table 1: Summary of Background Document Review

Document	Date	Author
2017 Airspace Evaluation	July 2017	Engineering & Environmental Solutions, LLC (E&ES)
Weekly inspections performed by Consumers Energy Company (CEC)	June 2016 – May 2017	Varying CEC J.H. Campbell Generating Facility Qualified Personnel
J.H. Campbell Dry Ash Landfill 2016 Annual RCRA CCR Landfill Inspection Report	October 2016	Golder Associates Inc.
J.H. Campbell Dry Ash Landfill 2015 Initial Annual RCRA CCR Landfill Inspection Report	January 2016	Golder Associates Inc.
2015 Airspace Evaluation	October 2015	Engineering & Environmental Solutions, LLC
2015 Fill Progression Plan	February 2015	Engineering & Environmental Solutions, LLC
J.H. Campbell Ash Disposal Area, Triennial Ash Dike Risk Assessment Report – Spring 2014	December 2014	Barr Engineering Company
J.H. Campbell Ash Disposal Area, 2012 Ash Dike Risk Assessment Final Inspection Report	July 2012	AECOM Technical Services, Inc.



Document	Date	Author
Surveillance Monitoring Programs (SMPs)	December 2010, Revised 2015	CEC
J.H. Campbell Generating Facility Ash Dike Risk Assessment, Potential Failure Mode Analysis (PFMA) Report	November 2009	AECOM Technical Services, Inc.
J.H. Campbell Ash Storage Facility Expansion	November, 1993	STS Consultants Ltd.



3.0 2017 VISUAL INSPECTION

The 2017 onsite inspection of the Dry Ash Landfill was performed by Golder Associates Inc. (Golder) on May 17, 2017.

Golder's inspectors (Ms. Tiffany Johnson and Ms. Samantha Fentress) were accompanied by three CEC representatives, as follows:

- Mr. George McKenzie, CEC System Engineering Department
- Mr. Bradley Runkel, CEC Environmental Services Department
- Ms. Bethany Swanberg, CEC Environmental Services Department

The inspection checklist form is provided in Appendix A. The checklist includes observations and recommendations as a result of the visual inspection and also includes 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 or noted. At the time of inspection the southern portion of the landfill (Cells 3 and 4) was undergoing active filling.
- Approximate volume of CCR at the time of inspection.
 - The volume of CCR at the time of inspection was approximately 4,614,000 cy (E&ES, 2017).
- 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 or noted.
- Any other change(s) which may have affected the stability or operation of the CCR units since the previous inspection.
 - None were observed or noted.

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:

- Observed isolated locations of erosion at inlet inverts to the Cell 2 downchute.
- Observed erosion and liner exposed on northern slope of the landfill between Cells 1 and 2 above a bench.
- Observed areas of minor erosion on west, north and east slopes.
- Observed mower equipment damage to the irrigation sprinkler heads along northern slopes of Cell 1 and 2, and tall vegetation in the benches along the southeast side of the landfill.
- Small animal burrows noted along west, north and east sides of the landfill bottom and toe slopes.
- Observed grout weathering and animal damage at the downchute grouted riprap locations.



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 J.H. Campbell 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
2017 Airspace Evaluation	July 2017	Engineering & Environmental Solutions, LLC (E&ES)
Weekly inspections performed by Consumers Energy Company (CEC)	June 2016 – May 2017	Varying CEC J.H. Campbell Generating Facility Qualified Personnel
J.H. Campbell Dry Ash Landfill 2016 Annual RCRA CCR Landfill Inspection Report	October 2016	Golder Associates Inc.
J.H. Campbell Dry Ash Landfill 2015 Initial Annual RCRA CCR Landfill Inspection Report	January 2016	Golder Associates Inc.
2015 Airspace Evaluation	October 2015	Engineering & Environmental Solutions, LLC
2015 Fill Progression Plan	February 2015	Engineering & Environmental Solutions, LLC
J.H. Campbell Ash Disposal Area, Triennial Ash Dike Risk Assessment Report – Spring 2014	December 2014	Barr Engineering Company
J.H. Campbell Ash Disposal Area, 2012 Ash Dike Risk Assessment Final Inspection Report	July 2012	AECOM Technical Services, Inc.
Surveillance Monitoring Programs (SMPs)	December 2010, Revised 2015	CEC
J.H. Campbell Generating Facility 2009 Ash Dike Risk Assessment, Potential Failure Mode Analysis (PFMA) Report	November 2009	AECOM Technical Services, Inc.
J.H. Campbell Ash Storage Facility Expansion	November, 1993	STS Consultants Ltd.

**APPENDIX A
INSPECTION CHECKLIST FORM**

CCR LANDFILL VISUAL INSPECTION CHECKLIST

Facility Name: J.H. Campbell Dry Ash Landfill

Owner: Consumers Energy Company (CEC)

Purpose of Facility: Dry Ash Disposal

County, State: Ottawa County, Michigan

Inspected By: Tiffany Johnson and Samantha Fentress **Inspection Date:** 5/17/2017

Weather: Clear, 75-degrees F

ITEM					REMARKS
	Acceptable	Monitor/Maintain	Investigate	Repair	
1. General Conditions					
a. Current volume of CCR					Volume: ~4,614,000 CY (based on July 2017 survey)
b. Alterations	X				None
c. Grass cover	X				
d. Settlement/misalignment/cracks	X				None
e. Leachate Collection	X				Goldier observed the active flow of leachate into the Cell 2 gravity manhole from the pump in Cell 2. See Note 1.
2. Landfill Slope					
a. Erosion – liner exposed?		X			Observed isolated location of erosion at inlet inverts to the Cell 2 downchute. Also noted erosion and liner exposed at location on northern slope of the landfill between Cells 1 and 2. Observed areas of minor erosion on west, north and east slope. Maintain erosion controls. See Notes 2 and 3.
b. Rodent burrows		X			Observed burrows located along Cell 2 downchutes, maintain animal control procedures. See Note 3.
c. Vegetation		X			Equipment mower damage of the sprinkler (Irrigation) head along northern slopes of Cell 1 and 2, and tall vegetation in the benches along the southeast side of the landfill. Maintain vegetation control procedures. See Note 3.
d. Cracks/settlement	X				None observed.
e. Riprap/other erosion protection		X			Observed grout weathering on Cell 3 downchute riprap, maintain erosion controls in this area. See Note 2.
f. Slide, Slough, Scarp	X				None observed.
g. Benches		X			Isolated location of eroded topsoil and standing water along the Cell 3 diversion berm on the southeast slope and on the northern slopes of Cell 1/2, was also noted in 2016, maintain erosion controls. See note 2.
h. Final Cover	X				
i. Downchutes		X			Observed grout weathering and animal damage on Cell 2 and 3 downchute riprap, maintain erosion and animal controls in this area. See Note 2.
3. Crest					
a. Soil condition	X				
b. Comparable to design width or previous inspection	X				
c. Vegetation	X				
d. Rodent burrows	X				
e. Exposed to heavy traffic	X				
f. Damage from vehicles/machinery	X				
4. Toe					
a. Vegetation		X			Observed erosion along Cell 2 perimeter toe, maintain erosion controls. See Note 2.
b. Rodent burrows		X			Small burrows noted along west, north and east sides of the landfill bottom and toe slopes, maintain animal control procedures. See Note 3.
c. Settlement	X				None observed.
d. Drainage conditions	X				None observed.
e. Seepage	X				None observed.

Notes:

- 1) Leachate collection system inspection was limited by visual observation of surficial components of the system, i.e. condition of riser pipes.
- 2) Maintain erosion controls per the SMP and monitor the condition of the grouted riprap along the downchutes as well as erosion along the diversion berms invert on the northern and southeastern slopes. This is not a deficiency or release as classified under 40 CFR 257.84(b)(5).
- 3) 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.

Africa	+ 27 11 254 4800
Asia	+ 852 2562 3658
Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 56 2 2616 2000

solutions@golder.com
www.golder.com

Golder Associates Inc.
15851 South US 27, Suite 50
Lansing, MI 48906 USA
Tel: (517) 482-2262
Fax: (517) 482-2460



Engineering Earth's Development, Preserving Earth's Integrity

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation