



Liner System Certification Report

D.E. KARN GENERATING FACILITY

BOTTOM ASH POND LINER SYSTEM CERTIFICATION REPORT

Essexville, Michigan

Pursuant to 40 CFR 257.71

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

Prepared By: Golder Associates Inc.
15851 South US 27, Suite 50
Lansing, Michigan 48906

October 2016

1655284





CERTIFICATION

Professional Engineer Certification Statement [40 CFR 257.71(b)]

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 257.71 (40 CFR Part 257.71), I attest that this Liner System Certification 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 257.71.

Golder Associates Inc.

Jeffrey R. Piaskowski
Signature

October 14, 2016
Date of Report Certification

Jeffrey R. Piaskowski, PE
Name

6201061033
Professional Engineer Certification Number



10/14/16



Table of Contents

CERTIFICATION..... C-1
 Professional Engineer Certification Statement [40 CFR 257.71(b)] C-1
1.0 INTRODUCTION..... 1
2.0 HISTORICAL DOCUMENTATION..... 2
3.0 BOTTOM ASH POND INVESTIGATION 3
4.0 CONCLUSIONS AND SUMMARY..... 4
5.0 REFERENCES..... 5

List of Tables

Table 3.0.1 Bottom Ash Pond Borehole Summary



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 solid waste management of CCR generated at electric utilities. Section 257.71 of the CCR RCRA Rule requires the owner or operator of an existing CCR surface impoundment to document whether or not the unit was constructed with a liner system meeting criteria outlined in Section 257.71(a)(1). According to Section 257.71(b), the documentation must be certified accurate by a qualified professional engineer in the State of Michigan.

Golder Associates Inc. (Golder) is submitting this report to certify that no liner constructed per the requirements of 40 CFR 257.71 exists beneath the Bottom Ash Pond CCR surface impoundment (Bottom Ash Pond) at the Consumers Energy Company (CEC) D.E. Karn Generating Facility (DE Karn) in Essexville, Michigan.



2.0 HISTORICAL DOCUMENTATION

Golder performed a review of the following historic documentation relative to the Bottom Ash Pond:

- Potential Failure Mode Analysis (PFMA) Report (AECOM 2009)
- Aerial photographs dated:
 - 1954
 - 1959
 - 1963
 - 1965

No evidence was found from review of the historic documentation that would indicate that the Bottom Ash Pond was constructed with a liner system as described in 40 CFR 257.71 Liner Design Criteria for existing CCR surface impoundments as follows:

- A liner consisting of a minimum of two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec as required in Section 257.71(a)(1)(i);
- A composite liner that meets the requirements of Section 257.70(b); or
- An alternative composite liner that meets the requirements of Section 257.70(c).



3.0 BOTTOM ASH POND INVESTIGATION

During May 2016, Golder continuously sampled soil at two locations in the Bottom Ash Pond. The sampling effort targeted depths ranging from 16 to 18 feet below the Bottom Ash Pond mudline. A sonic rig was used to advance the investigations, the locations and depths of which are summarized in Table 3.0.1 – Bottom Ash Pond Borehole Summary.

The boreholes were terminated approximately six to eight feet into native material underlying the CCR. Native material was composed of poorly-graded, fine- to medium-grained sand and low-plasticity clayey sand. No liner material meeting the criteria defined in Section 257.71(a)(1) was encountered in the boreholes.

Table 3.0.1 – Bottom Ash Pond Borehole Summary

Boring ID	Latitude	Longitude	Elevation	Borehole Depth (ft)
DEK-BH-16001	43.64743	-83.84023	593.7	16.3
DEK-BH-16002	43.64731	-83.83932	593.0	18.9

Note: Coordinates are given in NAD83
Elevation datum is NAVD88



4.0 CONCLUSIONS AND SUMMARY

Based on the subsurface investigation and review of available historic documentation, Golder has determined there is no liner beneath the Bottom Ash Pond at DE Karn based on the criteria provided in 40 CFR 257.71(a)(1)(i) – (iii). This report must be placed in the facility's operating record in accordance with Section 257.105(f) and must be made available on the facility's publicly accessible internet site in accordance with Section 257.107(f).

Sincerely,

GOLDER ASSOCIATES INC.

Megan Jehring, E.I.T.
Geotechnical Engineer

Jeff Piaskowski, P.E.
Project Engineer



5.0 REFERENCES

AECOM, 2009. Potential Failure Mode Analysis (PFMA) Report: D.E. Karn Generating Facility Ash Dike Risk Assessment – October 2009.

“Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments,” Title 40 – Protection of the Environment Part 257 – Criteria for Classification of Solid Waste Disposal Facilities and Practices Subpart D – Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments.

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 U.S. 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