



# **B.C. COBB GENERATING FACILITY**

## **BOTTOM ASH POND HAZARD POTENTIAL CLASSIFICATION ASSESSMENT REPORT**

**Muskegon, Michigan**

**Pursuant to 40 CFR 257.73**

**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**

**1652598**






### CERTIFICATION

#### Professional Engineer Certification Statement [40 CFR 257.73(a)(2)(ii)]

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 257.73 (40 CFR Part 257.73), I attest that this Hazard Potential Classification Assessment 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 257.73.

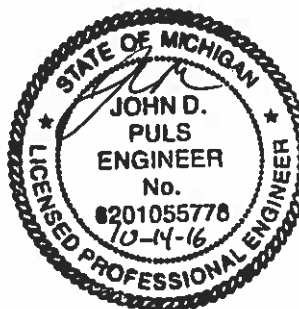
Golder Associates Inc.

  
\_\_\_\_\_  
Signature

October 14, 2016  
Date of Report Certification

John D Puls, PE  
Name

6201055787  
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. Section 257.73(a)(2) of the CCR RCRA Rule requires the owner or operator of an existing CCR surface impoundment to document the hazard potential classification of each CCR unit as either a high hazard potential CCR surface impoundment, a significant hazard potential CCR surface impoundment, or a low hazard potential CCR surface impoundment. Consequently, the owner or operator must document the basis for each hazard potential classification.

Hazard potential classification means the possible adverse incremental consequences that result from the release of water or stored contents due to failure of the diked CCR surface impoundment or mis-operation of the diked CCR surface impoundment or its appurtenances. The hazard potential classifications include high hazard potential CCR surface impoundment, significant hazard potential CCR surface impoundment, and low hazard potential CCR surface impoundment, which terms mean:

- High hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.
- Significant hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.
- Low hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the surface impoundment owner's property.

According to 257.73(a)(2)(ii), the hazard classification potential assessment must be certified by a qualified professional engineer (QPE) stating that an initial hazard potential classification and each subsequent periodic classification were conducted in accordance with the requirements of 40 CFR 257.73. Golder Associates Inc. (Golder) is submitting this Hazard Potential Classification Assessment Report (Report) to certify a significant hazard potential classification for the Bottom Ash Pond CCR surface impoundment (Bottom Ash Pond) at the Consumers Energy Company (CEC) B.C. Cobb Generating Facility (BC Cobb) in Muskegon, Michigan per 40 CFR Part 257.73(a)(2).



## 2.0 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT DETERMINATION

The Bottom Ash Pond is an existing CCR surface impoundment at BC Cobb located in Muskegon, Michigan as shown on Figure 1 – Site Location Map. BC Cobb was a coal fired power plant that formerly operated two coal burning baseload electrical power generating units. BC Cobb ceased operation on April 15, 2016 and is currently being decommissioned.

The Bottom Ash Pond is the southern-most CCR impoundment at BC Cobb. The perimeter dike is adjacent to the plant discharge channel which is connected to Muskegon Lake. The pond has a surface area of approximately 0.6 acres. The crest elevation is approximately 595.0 feet (NAVD88). The bottom elevation varies depending on deposition/removal of ash, but is currently approximately 589.0 feet (NAVD88). The total storage capacity of the Bottom Ash Pond is estimated at approximately 2.5 acre-feet.

Currently, no sluiced CCR is being discharged into the Bottom Ash Pond. The only source of inflow to the existing CCR surface impoundment is through direct precipitation onto the surface of the Bottom Ash Pond and the negligible amount of contact wash water deposited into the Bottom Ash Pond from demolition activities. After June 2016, the water level elevation within the Bottom Ash Pond is anticipated to equalize near the level of Muskegon Lake. Muskegon Lake's (Lake Michigan) mean long-term water level is 579.4 feet (NAVD88) (Golder 2016), which is below the bottom of the pond.

During the inflow design flood (1000-year storm event), the water levels will potentially be temporarily elevated in the Bottom Ash Pond due to accumulation of precipitation. The water levels have been estimated in Golder's B.C. Cobb Generating Facility Bottom Ash Pond, Inflow Design Flood Control System Plan (Golder 2016), which assumes no infiltration during the 1000-year storm event.

Table 2.0.1 provides a summary of the Bottom Ash Pond parameters used to determine the hazard classification:

- Pond bottom and berm elevations
- 1000-year storm event water elevations
- Volume of water stored above the mean lake level during the 1000-year storm event

The total water temporarily stored above the mean lake level during the 1000-year storm event is estimated to be 0.92 acre-feet. The lake level is assumed to be mean level, because it is related to the level of Lake Michigan rather than a local extreme rain event at BC Cobb.

**Table 2.0.1 - Bottom Ash Pond Dimension and Water Level Summary**

<b>Pond Bottom Elevation (ft)<sup>1,2</sup></b>	<b>Perimeter Berm Elevation (ft)<sup>1,2</sup></b>	<b>1000-year Water Elevation (ft)<sup>1,2</sup></b>	<b>Storage Volume during 1000-year Storm Event (acre-ft)<sup>3</sup></b>
589.0	595.0	591.92	0.92

Notes:

<sup>1</sup>Elevations are in NAVD88<sup>2</sup>Dimensions from topographic survey by Summit Surveying, Inc. (October 2015)<sup>3</sup>Storage volume based on volume of water during the 1000-year storm event above the mean lake level (579.4 feet) or pond bottom, whichever is greater

Based on the above parameters, if the perimeter dike fails on the west side of the pond, CCR from the perimeter dike and the surface impoundment would drain into the plant discharge channel, which is connected to Muskegon Lake. No probable loss of human life, economic loss, or disruption of lifeline facilities are expected during this scenario. However, there could be environmental damage that is not principally limited to the surface impoundment property owner's property. As a result, a significant hazard potential classification has been given to the Bottom Ash Pond surface impoundment at BC Cobb.



### 3.0 CONCLUSIONS AND SUMMARY

The Bottom Ash Pond at BC Cobb has been rated a significant hazard potential classification as a dike failure or mis-operation would result in a discharge of CCR from the dike and the surface impoundment into Muskegon Lake. No probable loss of human life is expected, but the dike failure may cause environmental damage that would not be limited to the surface impoundment owner's property.

Significant hazard potential classification assessments for existing CCR surface impoundments provide the design inflow criterion of the 1000-year storm event in the inflow design flood control system and the structural stability assessment required in 40 CFR 257.82 and 40 CFR 257.73, respectively. Consequently, it also requires that an emergency action plan be developed as required in 40 CFR 257.73.

This hazard potential classification certification must be placed in the facility's operating record in accordance with 257.105(f) and must be made available on the facility's publicly accessible internet site in accordance with 257.107(f).

Sincerely,

**GOLDER ASSOCIATES INC.**

Handwritten signature of Scott Stoneman in blue ink.

Scott Stoneman, P.E.  
Senior Water/Civil Engineer

Handwritten signature of John Puls in blue ink.

John Puls, P.E.  
Senior Engineer



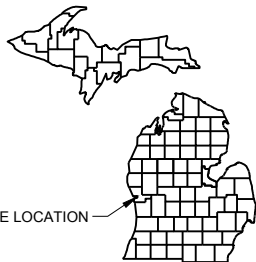
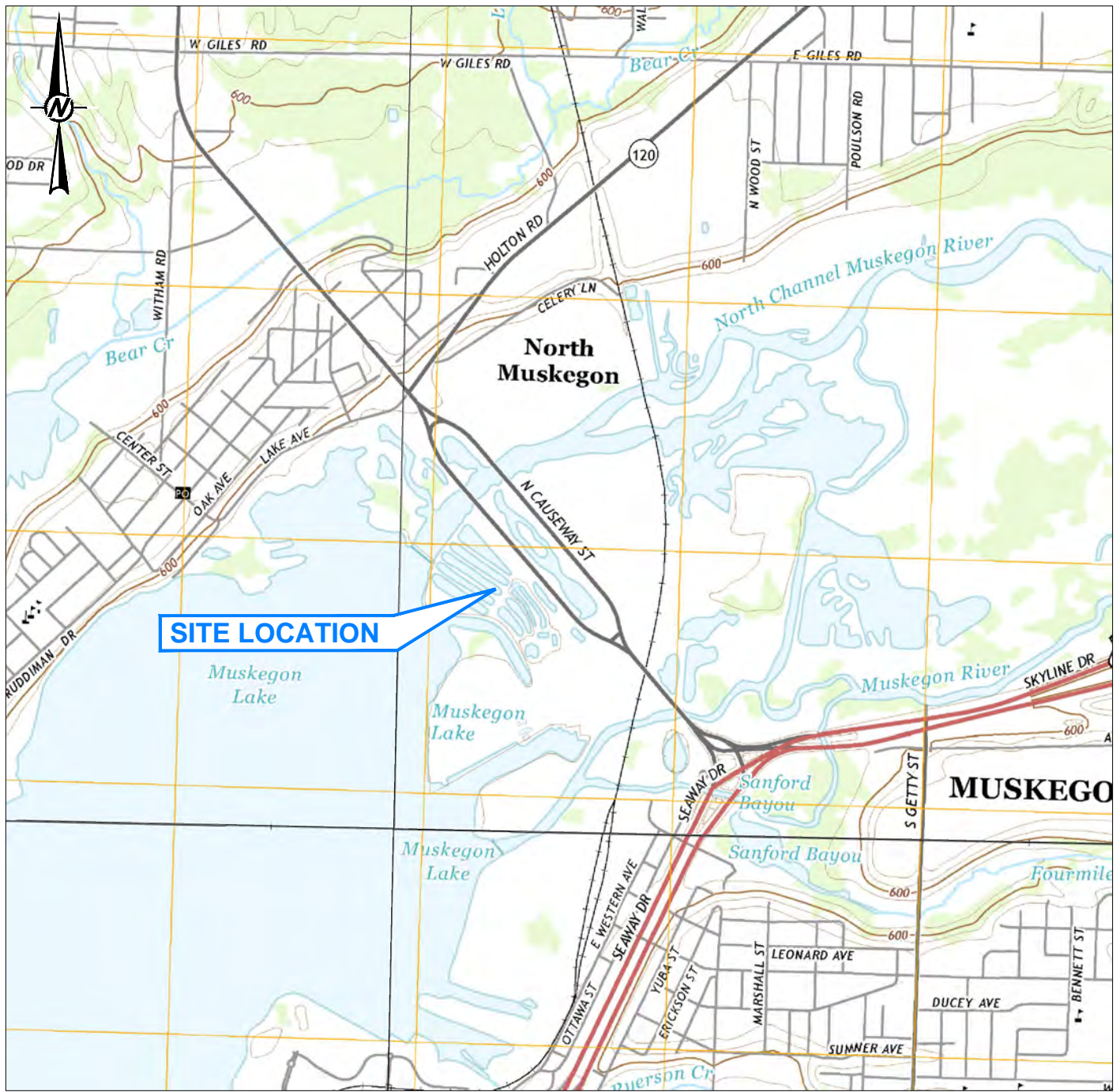
## 4.0 REFERENCES

Golder Associates. 2016. B.C. Cobb Generating Facility Bottom Ash Pond, Inflow Design Flood Control System Plan.

USEPA (Environmental Protection Agency). 2015. Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule. 40 CFR Part 257. Effective Date October 19, 2015.



## FIGURES



SITE LOCATION

**MICHIGAN COUNTIES**  
NOT TO SCALE

**REFERENCE(S)**

1. BASE MAP TAKEN FROM 7.5 MINUTE U.S.G.S. QUADRANGLES OF DALTON, TWIN LAKE, MUSKEGON EAST, AND MUSKEGON WEST, MICHIGAN, DATED 2014.



CLIENT  
**CONSUMERS ENERGY COMPANY**  
 151 N. CAUSEWAY  
 MUSKEGON, MI 49445

PROJECT  
**B.C. COBB PLANT, BOTTOM ASH POND  
 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT REPORT  
 MUSKEGON, MI 49445**

CONSULTANT

YYYY-MM-DD      2016-06-14

DESIGNED            JRP

PREPARED          AM

REVIEWED          JRP

APPROVED          MAB



TITLE

**SITE LOCATION MAP**

PROJECT NO.  
1652598

CONTROL  
B001

REV.  
0

FIGURE  
1

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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