REPORT

B.C. Cobb Generating Facility
Bottom Ash Pond
2018 Annual Surface Impoundment Inspection Report

Muskegon, Michigan Pursuant to 40 CFR 257.83

Submitted to:

Consumers Energy Company

1945 W. Parnall Road Jackson, Michigan, USA 49201

Submitted by:

Golder Associates Inc.

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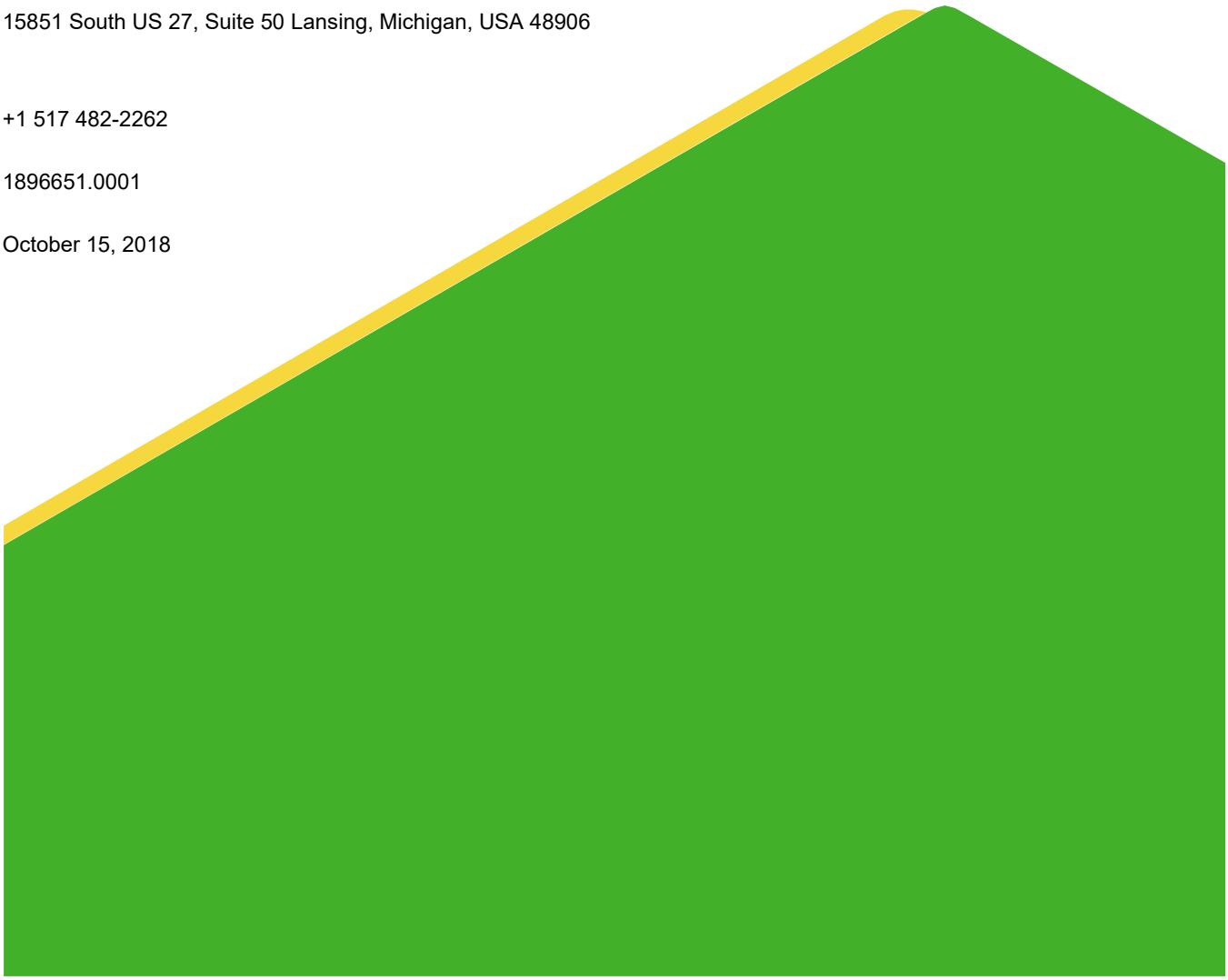
October 15, 2018



Certifications

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 15, 2018

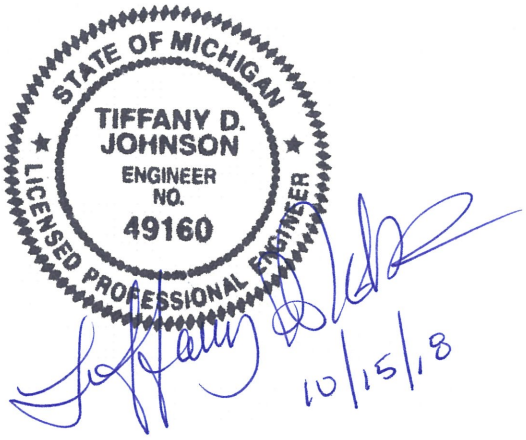
Date of Report Certification

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"). 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 B.C. Cobb Generating Facility (B.C. Cobb) 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. The inspection included the following:

- Review of the available 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

CEC ceased electrical generation at BC Cobb on April 15, 2016; the facility is currently being decommissioned. Before ceasing electrical generation, the Bottom Ash Pond collected sluiced bottom ash from the BC Cobb Units 4 and 5 electrical generating units. Stored bottom ash was mechanically removed routinely from the pond as needed to maintain storage capacity. The Bottom Ash Pond discharges water via two corrugated metal outflow pipes. The pipes discharge to an internal pond network (Ponds 0 through 8). The closed NPDES permitted outfall to Muskegon Lake has been grouted. The B.C. Cobb Facility is located in Muskegon, Michigan. Generally, B.C. Cobb is bordered by Muskegon Lake to the west, the Muskegon River to the north, and M-120 highway to the east. Bottom ash was historically sluiced from the B.C. Cobb Units 4 and 5 electrical generating unit to an onsite Bottom Ash Pond. Currently, the Bottom Ash Pond is not receiving CCR material.

The existing reports reviewed for this assessment are summarized in Table 1 below.

Table 1: Summary of Background Document Review

Document	Date	Author
Weekly Inspection Reports	January 2017 – January 2018	Bottom Ash Pond Qualified Personnel
B.C. Cobb Generating Facility Bottom Ash Pond Closure Plan	February 2018	Golder Associates Inc.
B.C. Cobb Bottom Ash 2017 Annual RCRA CCR Surface Impoundment Inspection Report	October 2017	Golder Associates Inc.
B.C. Cobb Bottom Ash 2016 Annual RCRA CCR Surface Impoundment Inspection Report	October 2016	Golder Associates Inc.
B.C. Cobb Bottom Ash 2015 Initial Annual RCRA CCR Surface Impoundment Inspection Report	January 2016	Golder Associates Inc.
Surveillance Monitoring Programs (SMPs)	December 2010, Revised 2015	CEC

3.0 2018 VISUAL INSPECTION

Golder performed an onsite inspection of the Bottom Ash Pond on May 9, 2018. Golder inspectors, Tiffany Johnson, P.E. and Halle Doering, EIT, were accompanied by two CEC representatives and one FK Engineering (FKE) representative, as follows:

- Mr. George McKenzie, CEC System Engineering Department

- Ms. Michelle Marion, CEC Environmental Services Department
- Mr. Zach Carr, FKE, CEC consultant

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.
  - In October 2016, the Bottom Ash Pond was regraded to include a berm around the northern portion of the pond, up to elevation 595 (NAVD88), however there were no new changes since the 2017 inspection.
- Any instrumentation in place designed to monitor the structural stability of the Bottom Ash Pond.
  - At the time of the inspection and report, there are no plans for installation of stability monitoring instrumentation due to the planned decommissioning of the Bottom Ash Pond.
- Approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection.
  - The Bottom Ash Pond is currently dry and was dewatered as part of the process of decommissioning.
- Storage capacity of the impounding structure at the time of inspection.
  - The Bottom Ash Pond has a current storage capacity of approximately 9,800 cubic yards.
- Approximate volume of the impounded water and CCR at the time of inspection.
  - The Bottom Ash Pond is currently dry and impounds CCR only, the estimated volume of dry CCR is approximately 6,900 cubic yards.
- 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 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.
  - 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.

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

- The Bottom Ash Pond is dry and the conveyance pipes have been air gapped eliminating the transport of water to the pond;
- There is no longer seepage or evidence of seepage noted along the southern toe of the Bottom Ash Pond downstream slope;
- There were rodent burrows observed along the southwestern downstream slope; and
- There was erosion and sparse vegetation on the southwestern downstream slope.

4.0 LIMITATIONS OF ASSESSMENT

Golder has conducted the site inspection and prepared this report for the Bottom Ash Pond at B.C. Cobb. 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 Resource Conservation and Recovery Act (RCRA) reporting requirements in accordance with 40 CFR 257.83(b)(2). Golder has reviewed the available information the Bottom Ash Pond 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.

6.0 REFERENCES

Document	Date	Author
Weekly Inspection Reports	January 2017 – January 2018	Bottom Ash Pond Qualified Personnel
B.C. Cobb Generating Facility Bottom Ash Pond Closure Plan	February 2018	Golder Associates Inc.
B.C. Cobb Bottom Ash 2017 Annual RCRA CCR Surface Impoundment Inspection Report	October 2017	Golder Associates Inc.
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Signature Page

Golder Associates Inc.

Halle Doering
Staff Engineer

Tiffany D. Johnson, P.E.
Associate

APPENDIX A - INSPECTION CHECKLIST FORM

CCR SURFACE IMPOUNDMENT VISUAL INSPECTION CHECKLIST

Facility Name: B.C. Cobb Bottom Ash Pond

Owner: Consumers Energy Company (CEC)

Purpose of Facility: Detention and settlement of sluiced bottom ash

County, State: Muskegon County, Michigan

Inspected By: Tiffany Johnson and Halle Doering ***Inspection Date: May 9, 2018***

Weather: 66°F Overcast

ITEM	Acceptable	Monitor/Maintain	Investigate	Repair	REMARKS
1. General Conditions					
a. Year Minimum Water Elevation					Dry Pond
b. Year Average Water Elevation					Dry Pond
c. Year Maximum Water Elevation					Dry Pond
d. Current water level					Dry Pond
e. Current storage capacity					Volume: 9,800 cubic yards
f. Current volume of impounded water and CCR					Volume: 2,900 cubic yards
g. Alterations	X				N/A
h. Development of downstream plain	X				
i. Grass cover		X			Sparse to no vegetation, maintain vegetation controls, woody vegetation on west exterior slope, see note 3.
j. Settlement/misalignment/cracks	X				
k. Sudden drops in water level?	X				
a. Inflow Structure					Pond is awaiting closure and is dry.
b. Settlement	X				
c. Cracking	X				
d. Corrosion	X				
e. Obstacles in inlet	X				
f. Riprap/erosion control	X				
2. Outflow Structure					Outflows to Ponds 0-8.
a. Settlement	X				
b. Cracking	X				
c. Corrosion	X				
d. Obstacles in outlet	X				
e. Riprap/erosion control	X				
f. Seepage	X				
g. Upstream slope					Upstream slope of bottom ash pond considered as the interior slopes of the pond.
a. Erosion	X				Pond was recently graded.
b. Rodent burrows	X				
c. Vegetation	X				
d. Cracks/settlement	X				
e. Riprap/other erosion protection	X				N/A
f. Slide, Slough, Scarp	X				
3. Crest					
a. Soil condition	X				Bottom ash

ITEM	Acceptable	Monitor/Maintain	Investigate	Repair	REMARKS
b. Comparable to width from previous inspection	X				
c. Vegetation		X			Pine trees that remain intended to act as visual screening and dust suppression, maintain vegetation controls. See Note 3.
d. Rodent burrows	X				
e. Exposed to heavy traffic	X				
1. Damage from vehicles/machinery		X			Minor rutting observed on southwestern portion of perimeter road.
h. Downstream slope					Downstream slope considered the exterior southern and western slope of the pond.
a. Erosion		X			Intermittent minor erosion observed along the southern slope, maintain erosion controls. See Note 3.
b. Vegetation		X			Woody vegetation observed, maintain erosion controls. See Note 3.
c. Rodent burrows		X			Rodent burrows were observed along the western slope. Maintain animal controls. See Note 3.
d. Slide, Slough, Scarp	X				Minor rutting observed on southwestern portion of perimeter road.
e. Drain conditions	X				Downstream slope considered the exterior southern and western slope of the pond.
f. Seepage	X				
4. Toe					
1) Vegetation		X			Woody vegetation observed, maintain erosion controls. See Note 3.
a. Rodent burrows		X			Rodent burrows were observed along the western slope. Maintain animal controls. See Note 3.
b. Settlement	X				
c. Drainage conditions	X				
d. Seepage	X				

Notes:

1) Current storage capacity of the Bottom Ash Pond is based on approximate bottom elevation of 572.4 NAVD88 and elevation 593.0 NAVD88 which corresponds to two feet below the minimum berm elevation (595.0 NAVD88). The current volume of impounded CCR is unchanged from the previous inspection and is based on an approximate bottom elevation of 572.4 NAVD88 and the current pond CCR elevation of 590.0 NAVD88.

2) Previously observed seepage was not observed during this inspection. The Bottom Ash Pond is currently dry, which was likely the source of the historic seepage.

3) 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.

Name of Engineer: Tiffany D. Johnson, P.E.

Date: October 15, 2018

Engineering Firm: Golder Associates Inc.

Signature: 

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