



# Annual Inspection Report

## J.H. CAMPBELL GENERATING FACILITY

### BOTTOM ASH PONDS 3 NORTH AND SOUTH

2017 Annual Surface Impoundment Inspection Report

West Olive, Michigan

Pursuant to 40 CFR 257.83

**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

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## CERTIFICATIONS

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 12, 2017

\_\_\_\_\_  
Date of Report Certification

Tiffany D. Johnson, P.E.

\_\_\_\_\_  
Name

6201049160

\_\_\_\_\_  
Professional Engineer Certification Number





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## 1.0 BACKGROUND AND DOCUMENT REVIEW SUMMARY

The United States Environmental Protection Agency (EPA) promulgated the Resource Conservation and Recovery Act (RCRA) Coal Combustion Residuals (CCR) Rule (Rule) on April 17, 2015. The Rule requires owners or operators of existing CCR surface impoundments to have those units inspected on an annual basis by a qualified professional engineer 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.

Golder Associates Inc. (Golder) was retained by Consumers Energy Company (CEC) to perform the annual inspection of the Bottom Ash Ponds 3 North and South at the J.H. Campbell Generating Facility (Site) 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 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 GENERAL BACKGROUND

J.H. Campbell is an active coal generating facility. The Facility is located in West Olive, Michigan and is bounded Lake Michigan to the west, Pigeon Lake to the south, and Lakeshore Drive to the east. Currently, bottom ash is sluiced from the J.H. Campbell Unit 3 electrical generating unit to Pond 3 South. Bottom Ash Pond 3 North has been clean closed (CCR was removed and placed in Pond A) and a bottom ash tank system and foundation is currently being constructed in the same location. An elevated trestle and pipe system hydraulically conveys bottom ash to Bottom Ash Pond 3 South. Stored bottom ash is removed via mechanical equipment from the ponds as required to maintain storage capacity on a yearly basis. Water is discharged from the ponds via corrugated high-density polyethylene outflow pipes into an internal ditch that conveys the flow to an internal pond system and ultimately to the Site's permitted National Pollutant Discharge Elimination System (NPDES) outfall. Additionally, a perimeter ditch is located toward the northern and western toe of Bottom Ash Ponds 3 North and South. This ditch is covered under the Site's NPDES Permit and flows into the internal pond system and is ultimately discharged through the Site's NPDES outfall.

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 inspections performed by Consumers Energy Company (CEC)	June 2016 – May 2017	Varying CEC J.H. Campbell Generating Facility Qualified Person
J.H. Campbell Bottom Ash Pond 3 Structural Stability and Safety Factor Assessment Report (includes 2016 inspection information)	October 2016	Golder Associates Inc.
J.H. Campbell Bottom Ash Pond 3 Closure Plan	October 2016	Golder Associates Inc.
J.H. Campbell Bottom Ash Pond 3 Inflow Design Flood Control System Plan	October 2016	Golder Associates Inc.
J.H. Campbell Bottom Ash Pond 3 2015 Initial Annual RCRA CCR Surface Impoundment Inspection Report	January 2016	Golder Associates Inc.



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 Ash Dike Risk Assessment, Potential Failure Mode Analysis (PFMA) Report	November 2009	AECOM Technical Services, Inc.



### 3.0 2017 VISUAL INSPECTION

Golder performed an onsite inspection of Bottom Ash Ponds 3 North and South on May 18, 2017. Golder inspectors, Tiffany Johnson, P.E. and Samantha Fentress, were accompanied by three CEC representatives, as follows:

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

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.
  - At the time of the inspection, Bottom Ash Pond 3 North had been clean closed (CCR was removed and transported to Pond A) and a bottom ash tank foundation was being constructed in the location of Bottom Ash Pond 3 North.
- Approximate minimum, maximum, and present depth and elevation of the impounded water and Coal Combustion Residuals (CCR) since the previous annual inspection.
  - Approximate minimum water surface elevation: 604 feet above mean sea level (ft-amsl), Bottom Ash Pond 3 South only.
  - Approximate average and current water surface elevation: 613 ft-amsl, this is the average operating level of Bottom Ash Pond 3 South.
  - Approximate maximum water surface elevation: 624.5 ft-amsl, this is the maximum operating level of Bottom Ash Pond 3 South based on the invert elevation of the outlet pipe.
- Any instrumentation in place designed to monitor the structural stability of Bottom Ash Ponds 3 North and South.
  - At the time of the inspection and report, there are no plans for installation of stability monitoring instrumentation for Bottom Ash Ponds 3 North or South.
- Storage capacity of the impounding structure at the time of inspection.
  - Current storage capacity is approximately 129,200 cubic yards (cys) for Bottom Ash Pond 3 South based on an approximate bottom of CCR elevation 600 ft-amsl NGVD29 and two feet of freeboard measured from a topographic survey collected in May of 2016 (629.8 NGVD29). Bottom Ash Pond 3 North has been removed.
- Approximate volume of the impounded water and CCR at the time of inspection.
  - Current volume of CCR and water is approximately 90,000 cys for Bottom Ash Pond 3 South based on an approximate bottom of CCR elevation of 600 ft-amsl NGVD29 measured from a topographic survey collected in May of 2016 and current pond operating level of 613 ft-amsl based on visual measurements. Bottom Ash Pond 3 North has been removed.



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

- Bottom Ash Pond 3 North was removed.
- Minor erosion, sloughing, and sparse riprap was observed along the interior slopes and around the inflow and outflow structures.
- Rodent burrows were observed along the exterior slopes of Bottom Ash Pond 3 South.





#### **4.0 LIMITATIONS OF ASSESSMENT**

Golder has conducted the site inspection and prepared this report for the J.H. Campbell Generating Facility. 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 on the J.H. Campbell Bottom Ash Ponds 3 North and South 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.

### GOLDER ASSOCIATES INC.

Handwritten signature of Samantha Fentress in black ink.

Samantha Fentress  
Engineer

Handwritten signature of Tiffany D. Johnson in blue ink.

Tiffany D. Johnson, P.E.  
Associate



## 6.0 REFERENCES

Document	Date	Author
Weekly inspections performed by Consumers Energy Company (CEC)	June 2016 – May 2017	Varying CEC J.H. Campbell Generating Facility Qualified Person
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**APPENDIX A  
INSPECTION CHECKLIST FORM**

## CCR SURFACE IMPOUNDMENT VISUAL INSPECTION CHECKLIST

**Facility Name:** J.H. Campbell Bottom Ash Pond 3

**Owner:** Consumers Energy Company (CEC)

**Purpose of Facility:** Detention and settlement of sluiced bottom ash from Unit 3

**County, State:** Ottawa County, Michigan

**Inspected By:** Tiffany Johnson and Samantha

**Inspection Date:** 5/18/2017

**Fentress**

**Weather:** Cloudy, windy, 70-degrees F

ITEM					REMARKS
	Acceptable	Monitor/Maintain	Investigate	Repair	
1. General Conditions					<b>NOTE: At the time of the inspection, Bottom Ash Pond 3 North had been clean closed (CCR was removed and transported to Pond A) and a bottom ash tank foundation was being constructed.</b>
a. Year Minimum Water Elevation					Elevation: 604.0 ft-amsl NGVD29 Pond 3 South Only
b. Year Average Water Elevation					Elevation: 613 ft-amsl NGVD29 Pond 3 South Only
c. Year Maximum Water Elevation					Elevation: 624.5 ft-amsl NGVD29 Pond 3 South Only
d. Current water level					Elevation: 613 ft-amsl NGVD29 Pond 3 South Only
e. Current storage capacity					Volume: ~129,200 cys Pond 3S only (See Note 1)
f. Current volume of impounded water and CCR					Volume: ~90,000 cys for Pond 3S only (See Note 1)
g. Alterations	X				Bottom Ash Pond 3N has been removed.
h. Development of downstream plain		X			Intermittent historical plains observed from historical seeps, maintain water level controls and erosion controls. There were active seeps observed. See Note 4.
i. Grass cover	X				
j. Settlement/misalignment/cracks		X			Continue weekly monitoring in accordance with SMP, no change was observed. See Note 2.
k. Sudden drops in water level?	X				Bottom Ash Pond 3N has been removed.
2. Inflow Structure					
a. Settlement	X				None observed.
b. Cracking	X				None observed.
c. Corrosion		X			Perform routine maintenance of inflow piping and supports. See Note 4.
d. Obstacles in inlet	X				None observed.
e. Riprap/erosion control	X				
3. Outflow Structure					
a. Settlement		X			Minor bend noted in outlet pipe of Pond 3, continue maintenance controls and monitor in accordance with the SMP. See Note 4.
b. Cracking	X				None observed.
c. Corrosion	X				None observed.
d. Obstacles in outlet	X				None observed.
e. Riprap/erosion control		X			Minor erosion at outlets, maintain erosion control procedures, see Note 4.
f. Seepage	X				None observed.
4. Upstream slope					
a. Erosion		X			Intermittent interior erosion rills observed along eastern slopes, maintain erosion controls in this area. See Note 4.
b. Rodent burrows	X				None observed.
c. Vegetation		X			Sparse vegetation, maintain vegetation controls, see note 4.
d. Cracks/settlement	X				None observed.
e. Riprap/other erosion protection		X			Riprap is sparse, maintain erosion controls, see note 4.
f. Slide, Slough, Scarp		X			Minor sloughing observed, maintain erosion controls, see note 4.
5. Crest					
a. Soil condition	X				Gravel and bottom ash
b. Comparable to width from previous inspection	X				

ITEM	Acceptable	Monitor/Maintain	Investigate	Repair	REMARKS
c. Vegetation	X				
d. Rodent burrows	X				None observed.
e. Exposed to heavy traffic	X				
f. Damage from vehicles/machinery		X			Minor rutting observed along crest of Pond 3 east, maintain road grading controls. See Note 4.
6. Downstream slope					
a. Erosion		X			Observed areas of minor erosion, maintain erosion controls. See Note 4.
b. Vegetation		X			Observed areas of sparse vegetation, maintain vegetation controls. See Note 4.
c. Rodent burrows		X			Observed rodent burrows along western slopes, maintain animal control procedures, see note 4.
d. Slide, Slough, Scarp		X			See Note 2.
e. Drain conditions	X				
f. Seepage	X				None observed.
7. Toe					
a. Vegetation	X				
b. Rodent burrows		X			
c. Settlement		X			See Note 2.
d. Drainage conditions		X			See Note 3.
e. Seepage		X			See Note 3.

**Notes:**

- 1) For Bottom Ash Pond 3 South Only - Current storage capacity is based on an approximate bottom elevation of 600.0 feet NGVD29 and two feet of freeboard measured from a topographic survey collected in May of 2016 (629.8 NGVD29). Current volume of impounded water and CCR are based on an approximate bottom elevation of 600.0 feet NGVD29 and approximated visual current pond water level (613 feet NGVD29).
- 2) Evidence of historic sloughing was observed along areas of the western slope of the Bottom Ash Pond 3S. Sloughing appeared unchanged from previous inspection. Golder recommends weekly observations for visual changes in appearance or further movement. This item is not considered a deficiency or release requiring immediate action per 40 CFR 257.83(b)(5).
- 3) Evidence of active seepage and piping was observed during this inspection in locations along the western toe of Bottom Ash Pond 3 South. Golder recommends CEC visually monitor for seepage on a weekly basis, per the site's SMP, to identify potential for changes in seep flow, sediment transport, or visible piping. This item is not considered a deficiency or release requiring immediate action per 40 CFR 257.83(b)(5).
- 4) 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 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](mailto:solutions@golder.com)  
[www.golder.com](http://www.golder.com)

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



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