



# Annual Inspection Report

## J.H. CAMPBELL GENERATING FACILITY

### BOTTOM ASH PONDS 1-2 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

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Date of Report Certification

Tiffany D. Johnson, P.E.

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Name

6201049160

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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 Bottom Ash Ponds 1-2 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 applicable 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. Bottom ash is sluiced from the J.H. Campbell Unit 1 and 2 electrical generating units to a pair of ponds, classified as Bottom Ash Ponds 1-2 North and South. An elevated trestle and pipe system hydraulically conveys bottom ash to the pond system. 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 (HDPE) 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) discharge. Additionally, a perimeter ditch is located toward the western and southern toe of Bottom Ash Pond 1-2. This flow in 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 Inspection Reports	June 2016 – May 2017	Varying CEC J.H. Campbell Generating Facility Qualified Person
J.H. Campbell Bottom Ash Ponds 1-2 Structural Stability and Safety Factor Assessment Report (includes 2016 inspection information)	October 2016	Golder Associates Inc.
J.H. Campbell Bottom Ash Ponds 1-2 Closure Plan	October 2016	Golder Associates Inc.
J.H. Campbell Bottom Ash Ponds 1-2 Inflow Design Flood Control System Plan	October 2016	Golder Associates Inc.
J.H. Campbell Bottom Ash Pond 1-2 2015 Initial Annual RCRA CCR Surface Impoundment Inspection	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 1-2 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.
  - The south and west slopes were recently (summer 2016) regraded to 3 horizontal to 1 vertical (3H:1V), erosion matting and grass seed was placed on the newly constructed slopes and a perimeter culvert and catch basin system was installed.
- Approximate minimum, maximum, and present depth and elevation of the impounded water and Coal Combustion Residuals (CCR) since the previous annual inspection.
  - Approximate minimum, maximum, and current water surface elevations (normal operating levels for the pond): 619.1 ft-amsl for Bottom Ash Pond 1-2 North and 618.8 ft-amsl for Bottom Ash Pond 1-2 South, based on the invert of the outlet pipe for each pond.
- Any instrumentation in place designed to monitor the structural stability of Bottom Ash Ponds 1-2 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 1-2 North or South.
- Storage capacity of the impounding structure at the time of inspection.
  - Current storage capacity is approximately 49,300 cubic yards (cys) for Bottom Ash Pond 1-2 South and approximately 60,300 cys for Bottom Ash Pond 1-2 North, based on an approximate bottom of CCR elevation that ranges from an approximate elevation of 594 feet (Pond 1-2 South) to 602 feet (Pond 1-2 North) NGVD29 and two feet of freeboard measured from a topographic survey collected in May of 2016 (622.7 NGVD29).
- Approximate volume of the impounded water and CCR at the time of inspection.
  - Current volume of CCR and water is approximately 40,800 cys for Bottom Ash Pond 1-2 South and approximately 50,700 cys for Bottom Ash Pond 1-2 North, based on an approximate bottom of CCR elevation that ranges from an approximate elevation of 594 feet to 602 feet NGVD29 and pond operating level (618.8 feet and 619.1 feet NGVD29 respectively for Bottom Ash Pond 1-2 South and Bottom Ash Pond 1-2 North) based on a topographic survey collected in May of 2016.
- 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:

- The southern and western slopes of Bottom Ash Pond 1-2 South were recently regraded to a 3H:1V grade and reseeded. There was minor equipment damage observed near the toe of the western slope in the erosion matting in the newly regraded area.
- Active seepage areas were observed along the exterior slope and toe for Bottom Ash Pond 1-2 North.
- Minor erosion, sloughing, and sparse riprap was observed along the interior slopes and around the inflow and outflow structures.





#### **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 1-2 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.

A handwritten signature in black ink that reads "Samantha Fentress".

Samantha Fentress  
Engineer

A handwritten signature in blue ink that reads "Tiffany D. Johnson".

Tiffany D. Johnson, P.E.  
Senior Consultant



## 6.0 REFERENCES

Document	Date	Author
Weekly Inspection Reports	June 2016 – May 2017	Varying CEC J.H. Campbell Generating Facility Qualified Person
J.H. Campbell Bottom Ash Ponds 1-2 Structural Stability and Safety Factor Assessment Report (includes 2016 inspection information)	October 2016	Golder Associates Inc.
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**APPENDIX A  
INSPECTION CHECKLIST FORM**

## CCR SURFACE IMPOUNDMENT VISUAL INSPECTION CHECKLIST

**Facility Name:** *J.H. Campbell Bottom Ash Pond 1-2*

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

**Purpose of Facility:** *Detention and settlement of sluiced bottom ash from Unit 1-2*

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

**Inspected By:** *Tiffany Johnson and Samantha Fentress*      **Inspection Date:** *May 18, 2017*

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

ITEM					REMARKS
	Acceptable	Monitor/Maintain	Investigate	Repair	
1. General Conditions					
a. Year Minimum Water Elevation					Approximate minimum, maximum, and current water surface elevations (normal operating levels for the pond): 619.1 ft-amsl for Bottom Ash Pond 1-2 North and 618.8 ft-amsl for Bottom Ash Pond 1-2 South, based on the invert of the outlet pipe for each pond
b. Year Average Water Elevation					
c. Year Maximum Water Elevation					
d. Current water level					
e. Current storage capacity					Volume: ~49,300 CY Pond 1-2S / ~60,300 CY Pond 1-2N (See Note 1)
f. Current volume of impounded water and CCR					Volume: ~40,800 CY Pond 1-2S / ~ 50,700 CY Pond 1-2N (See Note 1)
g. Alterations	X				South and west slopes were recently regraded and reseeded with erosion matting. New perimeter drainage system was installed along the south and west toe.
h. Development of downstream plain		X			Intermittent historical plains observed from active and historical seeps along western toe, maintain water level controls and erosion controls. See Note 5.
i. Grass cover	X				
j. Settlement/misalignment/cracks	X				Historical settlement observations were removed with slope regrading. Continue weekly monitoring of the south and west slopes in accordance with SMP. See Note 2.
k. Sudden drops in water level?	X				No sudden drops in water levels observed.
2. Inflow Structure					
a. Settlement	X				None observed.
b. Cracking		X			The exterior carrier pipe that supports the interior bottom ash water pipe in between Ponds 1-2 north and south showed signs of cracking and corrosion. See Note 5.
c. Corrosion		X			The exterior carrier pipe that supports the interior bottom ash water pipe in between Ponds 1-2 north and south showed signs of cracking and corrosion. Perform routine maintenance of inflow piping and supports. See Note 5.
d. Obstacles in inlet	X				None observed.
e. Riprap/erosion control		X			See Note 3.
3. Outflow Structure					
a. Settlement	X				None observed.
b. Cracking	X				None observed.
c. Corrosion	X				None observed.
d. Obstacles in outlet	X				None observed.
e. Riprap/erosion control		X			Minor erosion observed around outlet pipe along interior slope of 1-2S, maintain erosion controls in this area. See Note 5.
f. Seepage	X				None observed.
4. Upstream slope					
a. Erosion		X			Intermittent interior erosion rills noted along interior slopes, maintain erosion controls in this area as needed to protect the outflow pipes. See Note 5.
b. Rodent burrows	X				Rodent burrows were observed on the upstream slopes, maintain animal control procedures, see note 5.
c. Vegetation		X			Upstream slopes have sparse to bare vegetation, maintain erosion and vegetation controls. See Note 5.
d. Cracks/settlement	X				

ITEM					REMARKS
	Acceptable	Monitor/Maintain	Investigate	Repair	
e. Riprap/other erosion protection		X			Riprap is sparse around inlet and outlet pipes, maintain erosion controls, see note 5.
f. Slide, Slough, Scarp		X			Minor sloughing in localized areas where slopes are steep. Maintain erosion controls, see note 5.
5. Crest					
a. Soil condition	X				Gravel and Bottom Ash
b. Comparable to width from previous inspection	X				
c. Vegetation	X				
d. Rodent burrows	X				None observed.
e. Exposed to heavy traffic	X				
f. Damage from vehicles/machinery	X				None observed.
6. Downstream slope					
a. Erosion		X			Minor equipment damage noted along west exterior slope near toe, in newly constructed erosion matting areas, maintain erosion controls in this area. See Note 5.
b. Vegetation		X			Sparse vegetation observed intermittently along west and northwest slopes north of newly regraded areas, maintain vegetation controls. See Note 5.
c. Rodent burrows	X				Holes in the existing erosion matting were observed, not verified to be rodent holes.
d. Slide, Slough, Scarp	X				
e. Drain conditions	X				There is a newly installed drainage system at the toe of the southern and western slopes.
f. Seepage		X			There are several seeps at the toe of the western slope of Pond 1/2N, see note 4.
7. Toe					
a. Vegetation		X			Observed intermittent woody vegetation, maintain vegetation controls. See Note 5.
b. Rodent burrows	X				None observed at the toe.
c. Settlement	X				
d. Drainage conditions	X				There is a newly installed drainage system at the toe of the southern and western slopes.
e. Seepage		X			There are several seeps at the toe of the western slope of Pond 1/2S and N, see note 4.

**Notes:**

- 1) Current storage capacity is based on an approximate bottom of CCR elevation that ranges from an approximate elevation of 594 feet to 602 feet NGVD29 and two feet of freeboard measured from a topographic survey collected in May of 2016 (622.7 NGVD29). Volume of impounded water and CCR are based on an approximate bottom of CCR elevation that ranges from an approximate elevation of 594 feet to 602 feet NGVD29 and pond operating level (618.8 feet and 619.1 feet NGVD29 respectively for Pond 1-2S and Pond 1-2N) based on visual observations using a topographic survey collected in May of 2016.
- 2) Evidence of historic sloughing and settlement observed along areas of the western slope of the Bottom Ash Pond are now newly regraded and reseeded. Golder recommends continued weekly observations for visual changes in appearance of the newly regraded western slopes. This item is not considered a deficiency or release requiring immediate action per 40 CFR 257.83(b)(5).
- 3) Erosion controls for the base of support trestles for both ponds should be routinely maintained as required. Suggest reconfiguring discharge pipe or adding additional armoring around the discharge in this area. This item is not considered a deficiency or release requiring immediate action per 40 CFR 257.83(b)(5).
- 4) Seepage was observed at multiple locations along the toe of the Bottom Ash Ponds 1-2 North and South, even in the areas that were newly regraded. Evidence of historic piping was also observed but was not

active. Golder recommends that CEC visually monitor the seeps weekly, per the site's SMP, to identify 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).

- 5) 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.***

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***Date: 10-12-17***

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***Engineering Firm: Golder Associates Inc.***

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**Signature:**



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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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