

RCRA CCR SURFACE IMPOUNDMENT 2016 INSPECTION REPORT

PONDS 1 & 2, JR WHITING PLANT
ERIE, MICHIGAN

OCTOBER 13, 2016

PREPARED FOR:
CONSUMERS ENERGY COMPANY



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Certification

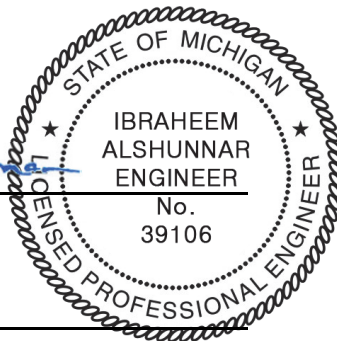
Professional Engineer Certification Statement [40 CFR 257.83 (b)]

I hereby certify that, having reviewed the attached documentation and being familiar with the provisions of Title 40 of the Code of Federal Regulations 40 CFR 257.83 (b), I attest that this RCRA CCR Surface Impoundment Inspection 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 257.83 (b).

The Mannik Smith Group, Inc.



Signature



October 13, 2016

Date of Report Certification

Ibraheem Shunnar, PE

Name

6201039106

Professional Engineer Certification Number

1.0 INTRODUCTION

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 (QPE) in accordance with 40 CFR 257.83(b).

The initial annual report was completed by Golder Associates Inc. (Golder) on October 30th, 2015 and presented in a report entitled *J.R. WHITING PONDS 1 AND 2 - Annual RCRA CCR Surface Impoundment Inspection Report* and dated January 2016.

The Mannik Smith Group, Inc. (MSG) was retained by Consumers Energy Company (CEC) to perform the 2016 annual inspection of Ponds 1 & 2 at the J.R. Whiting Generating Facility (Site) to document, to the extent reasonable based on the 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 including review of weekly inspections
- 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

The JR Whiting Generating Facility (JR Whiting) is a coal-fired power generation facility located in Erie, Michigan as presented on Figure 1 – Site Location Map. JR Whiting formerly operated coal-burning baseload units but ceased electrical generation on April 15, 2016. Prior to stopping electrical generation, Ponds 1 & 2 served two primary functions:

- Receive outflow from the Bottom Ash Pond for secondary detention and settlement of bottom ash
- Receive intermittent sluiced fly ash and low-volume process water from the generating facility for detention and settlement

JR Whiting Ponds 1&2 are no longer receiving CCRs from an active power generating plant. These ponds are contained by a perimeter dike which has, generally, a 20-foot wide crest and a crest elevation of 590.1 (NAVD88). The perimeter dikes are built of CCR materials. The crest area is graded to allow the flow of stormwater to be directed inwards towards the ponds. The elevation of water in the Ponds is estimated at 584 ft. (NAVD88).

Ponds 1 and 2 are interconnected by subsurface pipes. Historically, flow from both ponds was combined and then discharged through a common outfall into the forebay. The discharge pipe to the forebay was grouted on May 24, 2016 so there is no longer a point source discharge from the pond. The only remaining outflow from the ponds is evaporation.

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	10/2015-09/2016	Varying Consumers Energy Company (CEC) J.R. Whiting Generating Facility Qualified Persons
J. R. Whiting Ponds 1 and 2 - Annual RCRA CCR Surface Impoundment Inspection Report	January 2016	Golder Associates, Inc.
J.R. Whiting Ash Disposal Area Triennial Ash Dike Assessment Report – Spring 2014	December 2014	Barr Engineering Company
J.R. Whiting Ash Disposal Area, 2012 Ash Dike Risk Assessment Final Inspection Report	July 2012	AECOM Technical Services, Inc.
Dam Safety Assessment of CCW Impoundments J.R. Whiting Plant	June 2011	United States Environmental Protection Agency O'Brien and Gere Engineers, Inc.
Fossil Fuel Generation, Solid Waste Disposal Area - Surveillance Monitoring Programs (SMPs)	December 2010, Revised 2015	Consumers Energy Company
J.R. Whiting Generating Facility Ash Dike Risk Assessment, Inspection Report	December 2009	AECOM Technical Services, Inc.
J.R. Whiting Generating Facility Ash Dike Risk Assessment, Potential Failure Mode Analysis (PFMA) Report	December 2009	AECOM Technical Services, Inc.

3.0 VISUAL INSPECTION

The 2016 onsite visual inspection of Ponds 1 & 2 was performed by MSG on June 11, 2016. MSG's inspector (Mr. Ibraheem Shunnar) was accompanied by three Consumers Energy Company (CEC) representatives, as follows:

- Mr. George McKenzie, CEC Engineering Services Department
- Mr. Frank Rand, CEC Environmental Services Department
- Ms. Michelle Marion, CEC Environmental Services Department

The results of our inspection are presented in the checklist included in Appendix A. The checklist categorizes observed conditions of the impoundment or appurtenant structures as either acceptable, monitor/maintain, investigate or repair and 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 MSG recommends additional investigation to categorize the item.
- **Repair:** MSG recommends that items identified with a repair designation exhibited conditions that should initiate measures to 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.

The inspection checklist provides both observations and recommendations as 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.
 - No changes in geometry were observed since the prior inspection.
- The location and type of existing instrumentation and the maximum recorded readings on each instrument since the previous annual inspection.
 - There is currently no instrumentation in place designed to monitor for the structural stability of Ponds 1 & 2. At the time of the inspection and report, there are no plans for installation of stability monitoring instrumentation due to the planned decommissioning of Ponds 1 & 2.
- Approximate minimum, maximum, and present depth and elevation of the impounded water and Coal Combustion Residuals (CCR) since the previous annual inspection.
 - Based on our review of topographic surveys, minimum, maximum and present depths of water (surface water elevation to bottom of ash) are about 15, 32 ft. and 15 to 32 ft., respectively. Current water elevation is estimated at 584 ft.
 - Based on our review of topographic survey and available test borings, minimum, maximum and present depths of ash are about 12 ft., 35 ft. and 12 ft. to 35 ft., respectively. Average approximate pond bottom (bottom of in place CCR) elevation of 560 ft. for Pond 1 and 555 ft. for Pond 2 and a maximum fill elevation is 588 ft (Golder 2016).
- Minimum storage capacity of the impounding structure at the time of inspection.
 - The minimum storage capacity is 568,000 cubic yard.
- Approximate volume of the impounded water and CCR at the time of inspection.
 - Approximate volume of water is 99,250 cubic yards.
 - Approximate volume of ash is 420,850 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.

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 water elevation in the pond was lowered by drilling holes in the weir structure on the pond discharge to the forebay. The discharge pipe has since then been grouted and there is no discharge from the ponds anymore.

Based on a review of previous inspection reports listed in Table 1 compared to conditions noted during the inspection the following features were observed and documented and are 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:

1. Concrete debris was observed on the east and north slopes. It is understood this debris will be removed/consolidated during closure operations.
2. Rutting, uneven slopes and sparse vegetation were observed on the east and north slopes, apparently a result of removal of woody vegetation. Maintain these areas with erosion and vegetation controls and monitor per the SMP.
3. The removal of woody vegetation left several stumps along the west and east sides of Ponds 1 and 2. The stumps should be monitored per the SMP, specifically on the east side adjacent to Lake Erie, and erosion and vegetation controls maintained.
4. There were several rodent burrows located on the north, east and south sides. These areas should be monitored per the SMP and maintain animal control procedures.
5. Areas of wet soils, wetland type vegetation were observed from approximately two to three feet up the slope down to the toe of the west side of Ponds 1 and 2 and the west side of Pond 1. These areas did not appear to be active seepage areas; these areas should be monitored per the SMP, and maintain vegetation and water level controls.

4.0 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). The Mannik & Smith Group, Inc. has reviewed the available information on Ponds 1 & 2 and performed an onsite visual inspection. MSG's assessment is limited to the information provided by CEC and to the features that could be inspected visually in a safe manner. MSG cannot attest to the condition of subsurface or submerged structures.

5.0 REFERENCES

AECOM Technical Services, Inc., 2009. *J.R. Whiting Generating Facility, Ash Dike Risk Assessment*.

AECOM Technical Services, Inc., 2009. *Potential Failure Modes Analysis (PFMA) Report. J.R. Whiting Generating Facility, Ash Dike Risk Assessment*.

AECOM Technical Services, Inc., 2012. *J.R. Whiting Ash Disposal Area: 2012 Ash Dike Risk Assessment Final Inspection Report*.

Barr Engineering Company, 2014. *J.R. Whiting Ash Disposal Area: Triennial Ash Dike Risk Assessment Report – Spring 2014*.

Consumers Energy Company, 2010. *Fossil Fuel Generation Solid Waste Disposal Area Surveillance Monitoring Programs (SMPs)*.

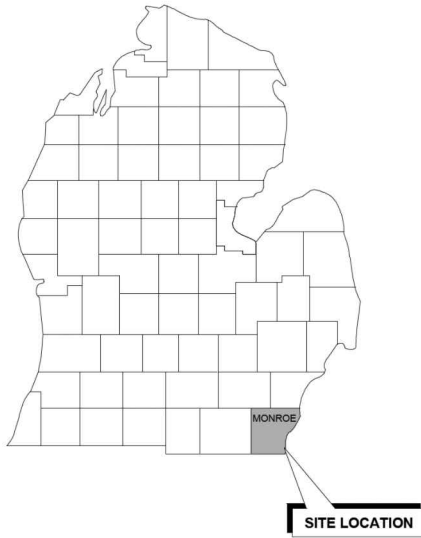
Consumers Energy Company, November 2015 through September 2016. *Weekly Inspection Reports*.

Golder Associates, Inc., January 2016. *J.R. Whiting Ponds 1 and 2 - Annual RCRA CCR Surface Impoundment Inspection Report*.

United States Environmental Protection Agency, O'Brien and Gere Engineers, Inc., 2011. *Dam Safety Assessment of CCW Impoundments – J.R. Whiting*.

FIGURES





MONROE COUNTY
NOT TO SCALE



FIGURE 1

SITE LOCATION MAP

PONDS 1 & 2
JR Whiting Generating Facility
Erie, Monroe County, Michigan

DATE	DRAWN BY	DESIGNED BY	PROJECT NO.
9/30/2016	RAR	ISS	C1790015



FIGURE 2

GENERAL SITE PLAN

PONDS 1 & 2
JR Whiting Generating Facility
Erie, Monroe County, Michigan

DATE	DRAWN BY	DESIGNED BY	PROJECT NO.
9/30/2016	RAR	ISS	C1790015

APPENDIX A

INSPECTION CHECKLIST





CCR SURFACE IMPOUNDMENT INSPECTION CHECKLIST

Facility Name:	JR. Whiting Ponds 1 & 2	Project Number	C1790017
County, State	Monroe County, Michigan	Inspection Date:	June 11, 2016
Owner	Consumers Energy	Inspected By:	Ibraheem Shunnar
		Weather (Sky, Precip, Temp):	Sunny

Item	Acceptable	Monitor/Maintain	Investigate	Repair	Notes
1. General Conditions					
a. Year Minimum Water Elevation	x				584 – about 6 feet below top of dike
b. Year Average Water Elevation	x				584
c. Year Maximum Water Elevation	x				584
d. Current water level	x				584
e. Current storage capacity	x				568,000 cy, MSG 2016 Estimate with 2' free board
f. Current volume of impounded water and CCR	x				519,000 cy, MSG 2016 Estimate
g. Alterations	x				None
h. Development of downstream plain	x				N/A
i. Grass cover		x			Acceptable, maintain as needed
j. Settlement/misalignment/cracks					
k. Sudden drops in water level?	x				None
2. Inflow Structure					
a. Settlement	x				None – pipe will be removed
b. Cracking	x				None visible
c. Corrosion	x				None visible
d. Obstacles in inlet	x				None visible
e. Riprap/erosion control	x				
3. Outflow Structure					
a. Settlement	x				N/A – Outlet pipe was grouted on May 24, 2016
b. Cracking	x				N/A
c. Corrosion	x				N/A
d. Obstacles in outlet	x				N/A
e. Riprap/erosion control	x				N/A
f. Seepage	x				N/A
4. Upstream slope					
a. Erosion		x			Minor erosion areas, maintain
b. Rodent burrows		x			Several burrows, maintain
c. Vegetation	x				Vegetation was cut to allow inspection
d. Cracks/settlement	x				None visible
e. Riprap/other erosion protection	x				
f. Slide, Slough, Scarp	x				None visible
5. Crest					
a. Soil condition	x				
b. Comparable to width from previous inspection	x				

Item	Acceptable	Monitor/Maintain	Investigate	Repair	Notes
c. Vegetation	x				None
d. Rodent burrows	x				
e. Exposed to heavy traffic	x				
f. Damage from vehicles/machinery	x				
6. Downstream slope					
a. Erosion	x				
b. Vegetation	x				
c. Rodent burrows		x			Several were observed, maintain
d. Slide, Slough, Scarp	x				None visible
f. Seepage	x				None visible
7. Toe					
a. Vegetation	x				
b. Rodent burrows	x				
c. Settlement	x				
d. Drainage conditions	x				
e. Seepage	x				West Side of Ponds 1 and 2 appears moist

NOTES:

1. Current volume of CCR and water was estimated by MSG using available boring data and existing topography information
2. Concrete debris was observed on the east and north slopes. It is understood this debris will be removed/consolidated during closure operations.
3. Rutting, uneven slopes and sparse vegetation were observed on the east and north slopes, apparently a result of removal of woody vegetation. Maintain these areas with erosion and vegetation controls and monitor per the SMP.
4. The removal of woody vegetation left several stumps along the west and east sides of Ponds 1 and 2. The stumps should be monitored per the SMP, specifically on the east side adjacent to Lake Erie, and erosion and vegetation controls maintained.
5. There were several rodent burrows located on the north, east and south sides. These areas should be monitored per the SMP and maintain animal control procedures.
6. Areas of wet soils, wetland type vegetation were observed from approximately two to three feet up the slope down to the toe of the west side of Ponds 1 and 2 and the west side of Pond 1. These areas did not appear to be active seepage areas; these areas should be monitored per the SMP, and maintain vegetation and water level controls.
7. Features observed and identified in this list were not considered a deficiency or release as classified under 40 CFR 257.83(b)(5) and required no immediate action beyond periodic maintenance and inspections.

SIGNATURE

Signature: Ibraheem Shunnar

Name of Engineer: Ibraheem Shunnar

Engineering Firm: The Mannik Smith Group, Inc.

Date: June 11, 2016