

2018 Annual Dam and Dike Inspection Report

Bottom Ash Pond Complex

**Rockport Plant
Indiana Michigan Power Company
Rockport, Indiana**

October 2018

Prepared for: Indiana Michigan Power Company – Rockport Plant

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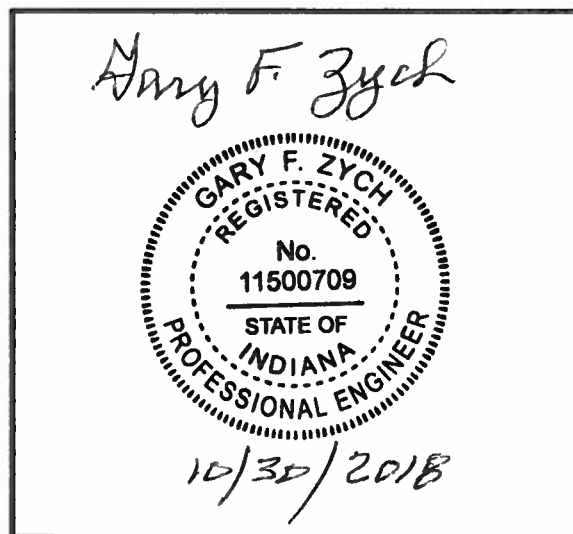
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I certify to the best of my knowledge, information and belief the information contained in this report meets the requirements of 40 CFR § 257.83(b).

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1.0 INTRODUCTION

This report was prepared by AEP- Geotechnical Engineering Services (GES) section, in part, to fulfill requirements of 40 CFR 257.83 for the CCR impoundments and to provide the Rockport Plant an evaluation of the entire Bottom Ash Pond Complex.

Gary Zych and Pedro Amaya performed the 2018 inspection of the Bottom Ash Pond Complex at the Rockport Plant. This report is a summary of the inspection and an assessment of the general condition of the facility. Mr. Mitch Montgomery, landfill supervisor for the Plant, was the facility contact during the inspection. The inspection was performed on October 10, 2018. Weather conditions were cloudy and the temperature was in the mid 70's(°F). There was no rainfall recorded over the seven days prior to the inspection.

2.0 DESCRIPTION OF IMPOUNDMENTS

The Bottom Ash Pond Complex consists of the East Bottom Ash Pond (EBAP) and the West Bottom Ash Ponds (WBAP), the East Waste Water Pond (EWWP), and the West Waste Water Pond (WWWP), the Reclaim Pond, and the Clear Water Pond (see Figure 1 of Attachment A). The Bottom Ash Complex is generally a below ground facility with only the west dike of the WBAP extending above grade such that the normal pool elevation is maintained above ground level. The exterior slopes are 2.5 Horizontal to 1 Vertical (2.5H:1V) with interior slopes of 2 H:1V. The East and West Bottom Ash Ponds are considered a CCR impoundment per 40 CFR 257 and items have been included in this report to fulfill these requirements. The EWWP, WWWP, Reclaim Pond, & Clear Water Pond are not CCR Impoundments but are included as part of this overall inspection report.

The WBAP dike is approximately 2000 feet long and is 13 feet high (as measured from interior toe) with a design crest width of 30 feet. The dike is a compacted soil earthen embankment. The top of the dike is at elevation 399.0 feet with the natural ground surface beneath the dikes at about elevation 390 feet. The exterior side slope of the embankment fill is designed to be 2.5:H to 1:V that transitions to 3:H to 1:V. The interior design side slopes are 2:H to 1:V. The bottom elevation of the WBAP is at elevation 386 ft msl with a minimum operating pool elevation of 394 ft msl providing a CCR storage capacity of 211 ac-ft.

The EBAP is an incised pond with the surrounding ground at elevations above 399 ft msl. The EBAP also has interior design slopes of 2:H to 1:V. The bottom elevation of the EBAP is at elevation 377 ft msl with a minimum operating pool elevation of 391 ft msl providing a CCR storage capacity of 337 ac-ft.

3.0 REVIEW OF AVAILABLE INFORMATION (257.83(b)(1)(i))

A review of available information regarding the status and condition of the EBAP and WBAP which include files available in the operating record, such as design and construction information, previous periodic structural stability assessments, previous 7 day inspection reports, and previous annual inspections has been conducted. Based on the review of the data there were no signs of actual or potential structural weakness or adverse conditions noted.

4.0 INSPECTION (257.83(b)(1)(ii))

4.1 CHANGES IN GEOMETRY SINCE LAST INSPECTION (257.83(b)(2)(i))

No modifications have been made to the geometry of the EBAP and WBAP since the last annual engineering inspection. The geometry of the impoundments has remained unchanged.

4.2 INSTRUMENTATION (257.83(b)(2)(ii))

There is no instrumentation located at the EBAP and WBAP.

4.3 IMPOUNDMENT CHARACTERISTICS (257.83(b)(2)(iii, iv, v))

Table 1 is a summary of the minimum, maximum, and present depth and elevation of the impounded water & CCR since the previous annual inspection; the storage capacity of the impounding structure at the time of the inspection; and the approximate volume of the impounded water and CCR at the time of the inspection.

Table 1

IMPOUNDMENT CHARACTERISTICS		
Bottom Ash Ponds		
	West Bottom Ash Pond	East Bottom Ash Pond
Approximate Minimum depth (elevation) of impounded water since last annual inspection	8 ft	0 ft.(N/A)**
Approximate Maximum depth (elevation) of impounded water since last annual inspection	10 ft. (396 ft msl)	0 ft.(N/A)**
Approximate Present depth of impounded water at the time of the inspection	9.8 ft. (395.8 ft msl)	< 1 ft. (378 ft msl)
Approximate Minimum depth (elevation) of CCR since last annual inspection	1.0 ft. (387.0 ft msl)	1 ft. (378 ft msl)
Approximate Maximum depth (elevation) of CCR since last annual inspection	13 ft.(399 ft msl)	22 ft.(399 ft msl)
Approximate Present depth (elevation) of CCR at the time of the inspection	13 ft. (399 ft msl)	22 (399 ft. msl)
Storage Capacity of impounding structure at the time of the inspection [crest el]	352 ac-ft.	557 ac-ft.
Approximate volume of impounded water at the time of the inspection	133 ac-ft.	<2 ac-ft.**
Approximate volume of CCR at the time of the inspection	133 ac-ft.	<50 ac-ft.

** - East BAP out of service and drained to the bottom invert of the low level drain

4.4 DEFINITIONS OF VISUAL OBSERVATIONS AND DEFICIENCIES

This summary of the visual observations uses terms to describe the general appearance or condition of an observed item, activity or structure. The meaning of these terms is as follows:

- Good:** A condition or activity that is generally better or slightly better than what is minimally expected or anticipated from a design or maintenance point of view.
- Fair/Satisfactory:** A condition or activity that generally meets what is minimally expected or anticipated from a design or maintenance point of view.
- Poor:** A condition or activity that is generally below what is minimally expected or anticipated from a design or maintenance point of view.
- Minor:** A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is below what is normal or desired, but which is not currently causing concern from a structure safety or stability point of view.
- Significant:** A reference to an observed item (e.g. erosion, seepage, vegetation, etc.) where the current maintenance program has neglected to improve the condition. Usually conditions that have been identified in the previous inspections, but have not been corrected.
- Excessive:** A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is above or worse than what is normal or desired, and which may have affected the ability of the observer to properly evaluate the structure or particular area being observed or which may be a concern from a structure safety or stability point of view.

This document also uses the definition of a “deficiency” as referenced in the CCR rule section §257.83(b)(5) Inspection Requirements for CCR Surface Impoundments. This definition has been assembled using the CCR rule preamble as well as guidance from MSHA, “Qualifications for Impoundment Inspection” CI-31, 2004. These guidance documents further elaborate on the definition of deficiency. Items not defined by deficiency are considered maintenance or items to be monitored.

A “deficiency” is some evidence that a dam has developed a problem that could impact the structural integrity of the dam. There are four general categories of deficiencies. These four categories are described below:

1. Uncontrolled Seepage

Uncontrolled seepage is seepage that is not behaving as the design engineer has intended. An example of uncontrolled seepage is seepage that comes through or around the embankment and is not picked up and safely carried off by a drain. Seepage that is collected by a drain can still be uncontrolled if it is not safely collected and transported. Seepage that is not clear and is turbid would also be considered as uncontrolled. Seepage that is unable to be measured and/or observe it is considered uncontrolled seepage.

Note: Wet or soft areas are not considered as uncontrolled seepage, but can lead to this type of deficiency. These areas should be monitored more frequently.

2. Displacement of the Embankment

Displacement of the embankment is large scale movement of part of the dam. Common signs of displacement are cracks, scraps, bulges, depressions, sinkholes and slides.

3. Blockage of Control Features

Blockage of Control Features is the restriction of flow at spillways, decant or pipe spillways, or drains.

4. Erosion

Erosion is the gradual movement of surface material by water, wind or ice. Erosion is considered a deficiency when it is more than a minor routine maintenance item.

4.5 VISUAL INSPECTION (257.83(b)(2)(i))

A visual inspection of the Bottom Ash Pond Complex including the EBAP and WBAP was conducted to identify any signs of distress or malfunction of the impoundment and appurtenant structures. Specific items inspected included all structural elements of the dam such as inboard and outboard slopes, crest, and toe; as well as appurtenances.

Overall the facility is in good condition. The impoundment is functioning as intended with no signs of potential structural weakness or conditions which are disrupting to the safe operation of the impoundment. Inspection photos are included in Attachment B. Additional pictures taken during the inspection can be made available upon request. A map presenting locations of the inspection observations is included in Attachment A.

East Bottom Ash Pond [Inactive]

1. The EBAP was out of service at the time of the inspection. Almost all flow has been removed from the impoundment as part of routine operations of the pond for cleaning out of bottom ash.
2. The interior slopes showed no signs of distress such as sloughing, bulges or erosion. The rip rap protection along the slope was visible to the toe and appeared in good condition and has not deteriorated.
3. The portion of diked embankment adjacent to the metal cleaning tank containment area was in good condition and showed no signs of distress. There are two pipes that are used to pump storm water from the containment area into the EBAP and they appeared to be functioning properly.
4. Since the pond was inactive and drained, the low level drainage structure was completely exposed. No structural defects were observed and all stop logs had been removed from the structure.
5. The principal spillway structure was not being utilized because the pond was drained. This structure was also completely exposed. It appeared in good condition. The concrete structure and skimmer boards showed minor signs of wear but were in fair condition.
6. The access road located at the crest of the pond appeared in good and stable condition with no signs of distress such as settlement, cracking or ruts.
7. There are areas within the pond and side slope where vegetation is starting to grow due to the pond being out of service for the long period.

West Bottom Ash Pond [Active]

8. The WBAP was in operation during the time of the inspection. The diverter discharge structure was configured to allow all flow to enter the WBAP. The concrete portion of the structure showed signs of wear but is in fair condition. The pool was at 395.8 which is near the maximum operating level.

9. The interior slopes showed no signs of distress such as sloughing, bulges or erosion. The rip rap protection along the slope that was visible appeared in good condition and has not deteriorated.
10. The splitter dike between the two ash ponds appeared to be in good condition and showed no signs of distress. The splitter dike separating the WBAP from the WWWP was also in good condition and showed no signs of distress.
11. The outboard slope of the WBAP was in good condition. There were no signs of movement or misalignment, sloughing or bulges. The inspection was conducted prior to mowing, but the vegetation was not excessively high.
12. There were no seepage or wet areas observed along the embankment.
13. The isolated erosion noted in the previous report was not observed during this inspection.
14. The crest of the west dike appeared in good and stable condition with no signs of distress such as settlement or ruts, and no erosion.
15. Flow was discharging into the low level drain structure. While this structure is typically used for draining the pond it appears to be functioning properly as part of the primary discharge for the pond. The structure appeared in good condition. Flow was unobstructed.
16. The primary discharge structure was in good condition and functioning properly. Flow was entering from all 3 sides of the box weir structure. The skimmer structure was in good condition.

East and West Waste Water Ponds

17. Only the West wastewater pond was in service on the date of the inspection. The pool elevation of the WWWP was 389.1. The East wastewater was not active and the water level was at elevation 386.9.
18. The interior slopes of the EWWP and WWWP Ponds were in good condition. The rip rap was free of any vegetation and showed no signs of deterioration or weathering.
19. The spillway structures in the EWWP and the WWWP were in good condition. There were no obstructions at either structures and they appear to be functioning properly. Flow over the weir in the WWWP was smooth. The flow discharged into the distribution structure where flow was directed to the Reclaim Pond.
20. The separation of the rectangular concrete weir channels in both ponds does not appear to be any different than the conditions noted in previous inspection reports.
21. The EWWP and WWWP are incised impoundments. The crests of the ponds were well maintained with no signs of settlement or depressions.

Reclaim Pond and Clear Water Pond

22. Flow was entering the Reclaim Pond from the WWWP. Flow within the Reclaim Pond was either pumped to back to the plant at the existing pump structure or discharged to the Clear Water Pond.
23. Flows within the Clear Water Pond are discharged through the primary discharge structure and to Outfall 001. The pool elevation of the Reclaim pond was 385.5. The pool elevation of the Clear Water Pond was 385.1.
24. The Reclaim Pond is an incised impoundments. The interior slopes of the Reclaim Pond were in good condition. The rip rap was free of any vegetation and showed no signs of deterioration or weathering. The crests of the pond was well maintained with no signs of settlement or depressions.

25. The interior of the north slope of the Clear Water Pond had vegetation growing out of the riprap near the water surface. This was the condition along the entire length of the slope.
26. The reclaim pump structure was in good condition and appeared to be pumping properly.
27. The outlet structure between the Reclaim Pond and Clear Water Pond appeared in good condition with no obstruction.
28. The outlet structure of the Clear Water Pond was in fair condition with no obstructions. The skimmer board and weir structure was in fair condition and there was some vegetation growing at the entrance to the weir structure.

4.6 CHANGES THAT EFFECT STABILITY OR OPERATION (257.83(b)(2)(vii))

Based on interviews with plant personnel and field observations there were no changes to the EBAP or WBAP, as well as the entire Bottom Ash Pond Complex since the last annual inspection that would affect the stability of the impounding structure. Sluiced inflow has been directed into the WBAP for the past 2 years.

5.0 SUMMARY OF FINDINGS

5.1 GENERAL OBSERVATIONS

The following general observations were identified during the visual inspection:

- 1) The outboard slopes, crest and inboard slopes and splitter dikes of the impoundments were generally in good condition. The embankment along the west side of the embankment did not show any signs of structural weakness or instability. The crest did not contain any ruts, cracks, depressions or other signs of instability. Specific maintenance and items to monitor are described in the subsequent sections of this report.

5.2 MAINTENANCE ITEMS

The following maintenance items were identified during the visual inspection, see inspection map for locations. Contact GES for specific recommendations regarding repairs:

- 2) Maintain vegetation growth within rip rap areas using herbicide.

5.3 ITEMS TO MONITOR/INVESTIGATE

The following items were identified during the visual inspection as items to be monitored, see inspection map for locations:

- 3) The 2017 report recommended that the cause of no flow through the low level drain pipe in the East BAP be determined. That work has not been completed. This should be determined prior to putting the EBAP into service.

5.4 DEFICIENCIES (257.83(b)(2)(vi))

At the Bottom Ash Pond Complex including the East & West Bottom Ash Ponds there were no signs of structural weakness or disruptive conditions that were observed at the time of the inspection that would require additional investigation or remedial action. There were no deficiencies noted during this inspection or during any of the periodic 7-day or 30-day inspections. A deficiency is defined as either 1) uncontrolled seepage, 2) displacement of the embankment, 3) blockage of control features, or 4) erosion, more than minor maintenance. If any of these conditions occur before the next annual inspection contact AEP Geotechnical Engineering immediately.

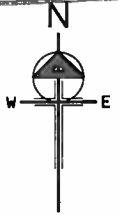
ATTACHMENT A

Site Plan and Inspection Location Map



FIGURE 1 – SITE PLAN

OCT 10, 2018



ACTIVE

30' WIDE DIKE
TOP EL. 399.0'
WEST BOTTOM ASH POND
BOTTOM EL. 386.0'

DISCH. STRUCTURES
No. 1 & 2

40' WIDE DIKE
TOP EL. 399.0'
EAST BOTTOM ASH POND
BOTTOM EL. 377.0'

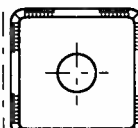
POND IS DRAINED

STRUCTURE No. 13
LOW WATER DISCH.

STRUCTURE No. 5
DISCH. & DISTRIB. FACILITY

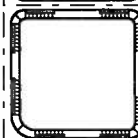
STRUCTURE No. 4
DISCH. & DISTRIB. FACILITY

STRUCTURE No. 3
LOW WATER DISCH.



NORTH
METAL CLEANING
TANK

TREATMENT STATION



SOUTH POND
(ABANDONED)

WASTEWATER HEADER
STRUCTURE No. 11

42" ϕ HEADER PIPE

30' WIDE DIKE
TOP EL. 399.0'

ACTIVE

20' WIDE DIKE
TOP EL. 392.0'
WEST WASTEWATER POND
BOTTOM EL. 377.50'

EAST WASTEWATER POND
BOTTOM EL. 375.0'

20' WIDE DIKE
TOP EL. 392.0'

DISCH. STRUCT. No. 7
STRUCTURE No. 8
COLLECT. WEIR FACIL.

DISCH. STRUCT. No. 6

VEGETATION ALONG
SLOPE OF CLEARWATER
POND.

STRUCTURE No. 10
DISCH. WEIR & STRUCT.
MONITORING BLDG.
C.B. No. 13A

CLEARWATER POND
BOTT. EL. 375.0'

DISCH. STRUCT. No. 12
RECLAIM POND
BOTT. EL. 375.0'
DISCH. STRUCT. No. 9

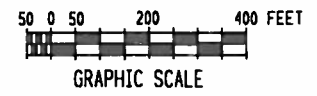
PUMP HSE.

66" ϕ CHP

20' WIDE DIKE
TOP EL. 392.0'

ROCKPORT SITE
BOTTOM ASH POND COMPLEX
INSPECTION LOCATION PLAN

GHS-10594 SHT. 3



ATTACHMENT B

Photos

#W – West bottom ash pond

#E – East bottom ash pond

#WW – Wastewater ponds

- Reclaim or Clearwater as described



Photo #1W – interior slope of west dike



Photo #2W – crest of west dike



Photo #3W – toe of west dike



Photo #4W – low level drain operation at full pond



Photo #5W – main discharge structure



Photo #6W– splitter dike between ash ponds



Photo #7W– discharge structures at full pond



Photo #1E – interior of inactive East ash pond



Photo #2E – discharge structures



Photo #3E – interior of east slope and ash pond



Photo #4E – interior of east slope at low water



Photo #1WW – interior north slope of West WW pond

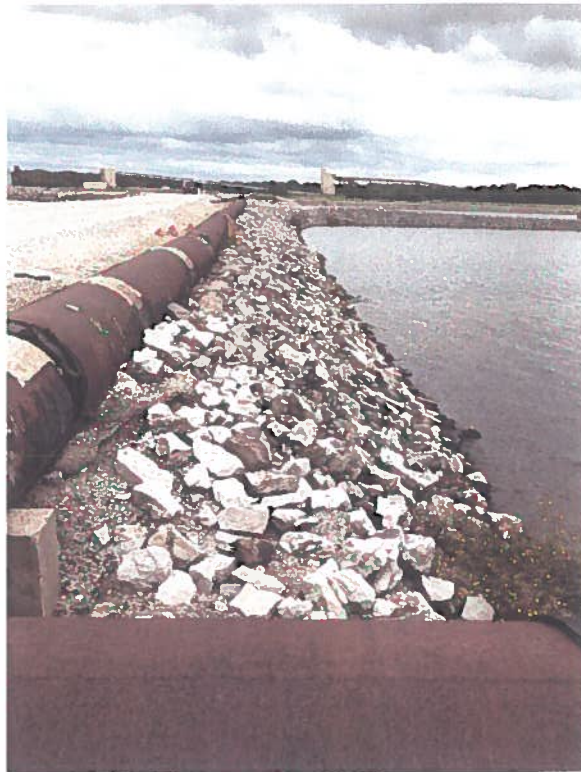


Photo #2WW– interior north slope of West WW pond

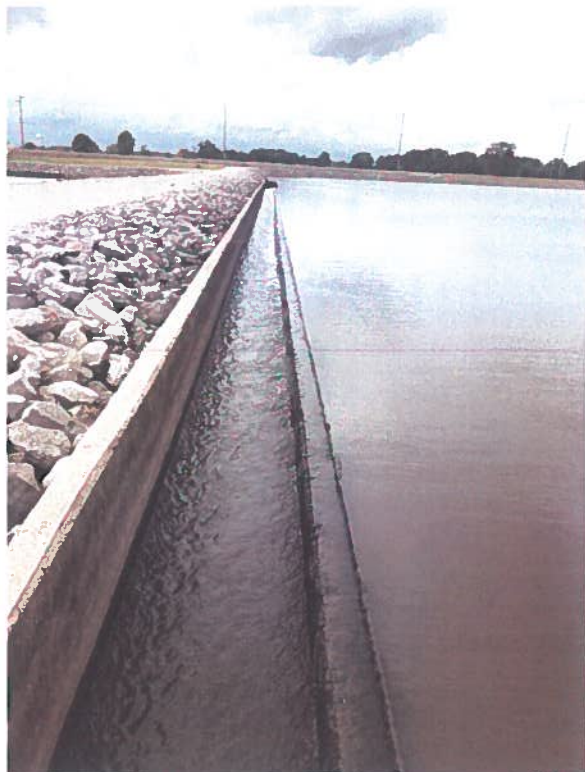


Photo #3WW – operating discharge structure in West WW pond



Photo #4WW – interior south slope Of West WW pond



Photo #5WW – interior north slope of East WW pond

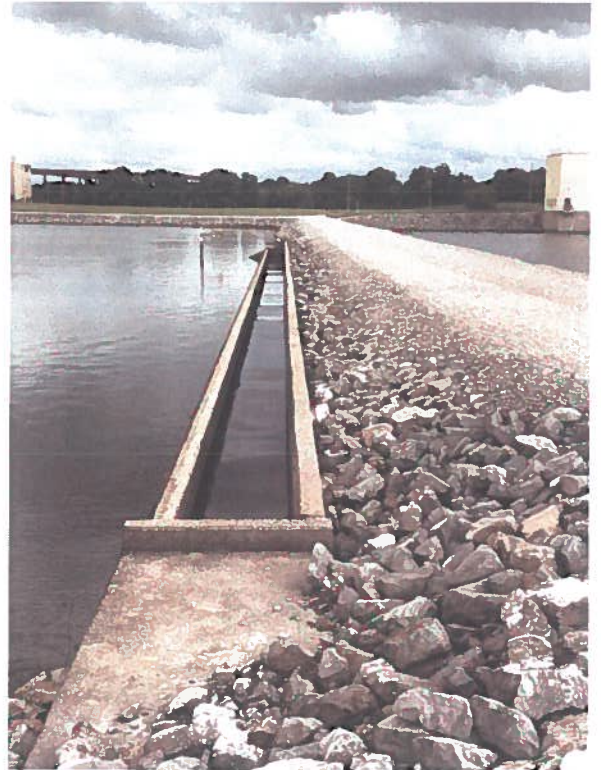


Photo #6WW– discharge weir structure at East WW pond



Photo #7WW – old displacement of concrete weir – rebar is still engaged.



Photo #1 – interior slope of north clearwater pond



Photo #2– discharge structure at clearwater pond



Photo #3 – interior south slope of clearwater pond



Photo #4 – discharge structure at clearwater pond