Annual Inspection Report - 2021

For Compliance with the EPA Coal Combustion Residuals (CCR) Rule 40 CFR §257.83(b)

Erickson Power Station –
Forebay, Retention Basin, and
Clear Water Pond

April 27, 2022

Prepared for:
Lansing Board of Water and Light
Erickson Power Station
3725 South Canal Road
Lansing, Michigan 48917

Prepared by:
HDR MICHIGAN, Inc.
5405 Data Court
Ann Arbor, Michigan 48108

Contents

Tables

Figures

This page is intentionally left blank.

1 Introduction and Purpose

HDR MICHIGAN, Inc. (HDR) has prepared this 2021 Annual Inspection Report for the Forebay, Retention Basin, and Clear Water Pond at Erickson Power Station following the requirements of the Federal Coal Combustion Residuals (CCR) Rule to demonstrate compliance of the existing Erickson Power Station in Lansing, Michigan.

On April 17, 2015, the United States Environmental Protection Agency (EPA) issued the final rule (Ref. [1]) for disposal of Coal Combustion Residuals (CCR) under Subtitle D of the Resource Conservation and Recovery Act (RCRA). CCR Rule 40 CFR §257.73(b) requires that owners or operators of an existing CCR surface impoundment that either 1) has a height of five feet or more and a storage volume of 20 acre-feet or more; or 2) has a height of 20 feet or more perform periodic structural stability assessments (40 CFR §257.73(d)) and periodic safety factor assessments (40 CFR §257.73(e)). It was determined that the Forebay, Retention Basin, and Clear Water Pond at the Erickson Power Station meets the first criteria with a height of five feet or more and a storage volume greater than 20 acre-feet.

Additionally, CCR Rule 40 CFR §257.83(b)(1) states that if the existing CCR surface impoundment is subject to the periodic structural stability assessment requirements under 40 CFR §257.73(d), then the impoundment must additionally be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. This report presents the 2021 annual inspections for the Forebay, Retention Basin, and Clear Water Pond.

The Annual Inspection Report presented herein addresses the specific requirements of 40 CFR §257.83(b). The visual inspection site visit was conducted on February 12, 2021, by Bryce Burkett, P.E. of HDR and this Annual Inspection Report was prepared by Mr. Burkett. Mr. Burkett is a registered Professional Engineer in the State of Michigan.

1.1 Site Location

Erickson Power Station is an electrical power generation facility located at 3725 South Canal Road, Lansing, Michigan which is owned and operated by Lansing Board of Water & Light (BWL). The latitude and longitude of the Erickson Power Station are approximately 42.692422 N and 84.657764 W. The site is located southwest of Lansing Michigan, near the intersection of Interstates 69 and 96, as shown in the vicinity map, Figure 1.

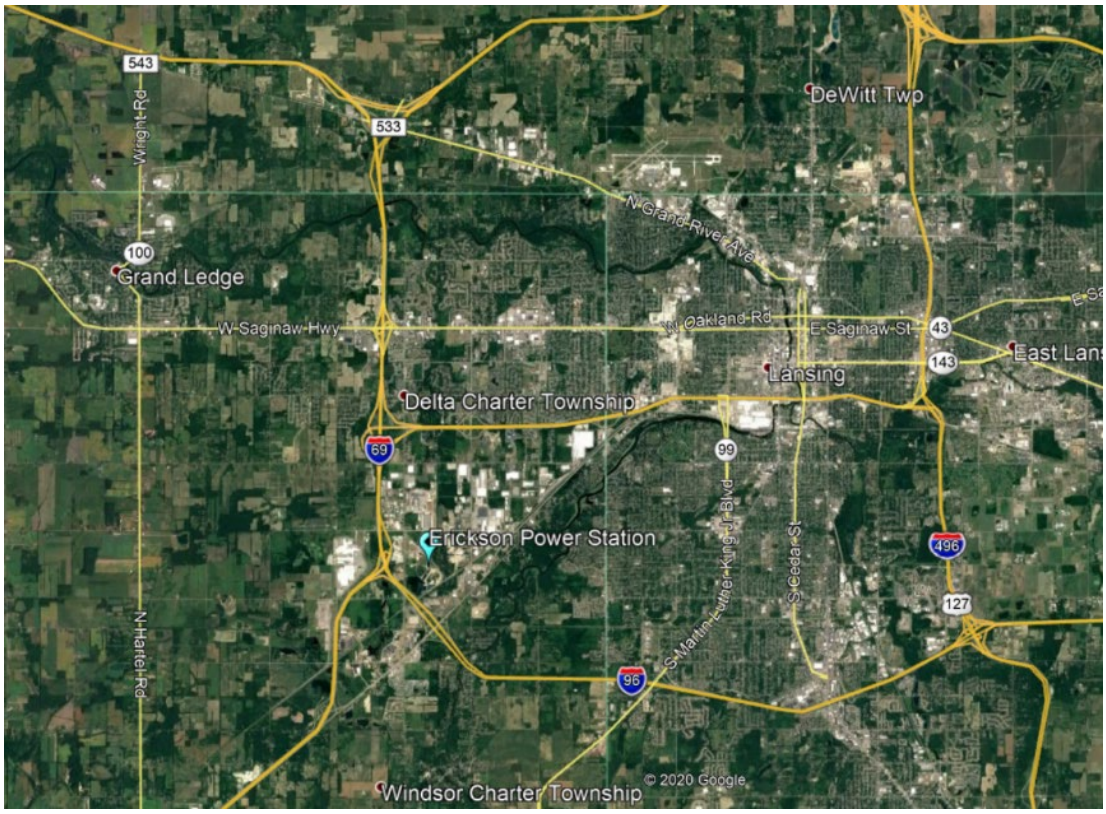


Figure 1. Site Vicinity Map

1.2 Site Description

Erickson Power Station was constructed starting in 1970, was completed in 1973, and is scheduled to close in 2022 as part of the BWL's move to cleaner energy sources. Erickson Power Station contains a single coal-fired steam turbine/generator capable of producing 165 megawatts of electricity.

Historically, fly ash and bottom ash resulting from the coal combustion process were mixed with water to form a slurry and pumped from the plant to the 33-acre impoundment system (physically closed in 2014). From the impoundment, the water then flowed hydraulically to the Clear Water Pond. Water from the Clear Water Pond was recycled back to the plant via the Pump House for reuse.

From 2009 through 2014, the ash was removed from the 33-acre impoundment, and a new system (including the construction of the Forebay and Retention Basin) (Ref. [7]) was installed. The Forebay and Retention Basin were installed within the footprint of the excavated 33-acre Former Impoundment and cover approximately 5-acres, leaving the Former Impoundment with a surface area of 28-acres.

Currently, bottom ash from the coal-fired boiler is sluiced from the plant to dewatering tanks (hydro-bins). The dewatered bottom ash is trucked to a sanitary landfill and the decant water is hydraulically fed through the current impoundment system, which consists of a series of three impoundments: the Forebay, Retention Basin, and Clear Water Pond.

The Forebay has an approximate normal pool surface areas of 2.1 acres. The Forebay has a normal operating pool level of approximately El. 882.3 feet NAVD 88[1].

The Retention Basin has an approximate normal pool surface areas of 2.6 acres. The Retention Basin has a normal operating pool level of approximately El. 881.8 NAVD 88.

The Clear Water Pond has a surface area (including top of dike) of approximately 4.7 acres. The Clear Water Pond has a normal operating pool level of approximately El. 881.7 to El. 882.0 feet (NAVD 88).

Figure 2 displays the Erickson Power Station site configuration.

Figure 2. Erickson Power Station Site Configuration

Figure 3 presents a Google Earth view looking NNE, identifying the Forebay, Retention Basin, and Clear Water Pond in relation to the impoundment system. Also viewable in Figure 3 is Lake Delta, Former Impoundment, coal pile, and Erickson Power Station.

[1] North American Vertical Datum of 1988

Figure 3. Google Earth Image of Impoundment System

1.3 Previous Assessments and Inspections

A dam assessment was performed previously for the Erickson Power Station Ash Pond, as summarized in the Round 10 Dam Assessment in GZA 2012 (Ref. [2]). GZA 2012 addressed the Ash Pond, which was undergoing closure at the time of the assessment. The Ash Pond has since been closed and is referred to herein as the Former Impoundment. GZA 2012 was conducted prior to the construction of the Forebay and Retention Basin.

HDR performed the Initial Inspections in accordance with CCR Rule 40 CFR §257.83(b) for the Forebay and Retention Basin (Ref. [4]), and Clear Water Pond (Ref. [3]) in 2020.

BWL performs weekly inspections of the entire CCR impoundment system. The weekly inspections are completed by qualified individuals to check for potentially hazardous conditions or structural weakness and the results of the inspections are documented internally on Weekly Inspection Reports.

There have been no reports of structural instability at the Forebay, Retention Basin, or Clear Water Pond during previous inspections.

2 Visual Inspection - 40 CFR §257.83(b)

The requirements to be documented in the Inspection Report for existing CCR surface impoundments are detailed in 40 CFR §257.83(b): *Annual inspections by a qualified professional engineer.* CCR Rule 40 CFR §257.83(b)(2) states that the inspection report must address the following items:

§257.83 (b)(2)(i): Any changes in geometry of the impounding structure since the previous annual inspection.

§257.83 (b)(2)(ii): The location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection.

§257.83 (b)(2)(iii): The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection.

§257.83 (b)(2)(iv): The storage capacity of the impounding structure at the time of the inspection.

§257.83 (b)(2)(v): The approximate volume of the impounded water and CCR at the time of the inspection.

§257.83 (b)(2)(vi): Any 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.

§257.83 (b)(2)(vii): Any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection.

The visual inspection site visit was conducted on February 12, 2021, by Bryce Burkett, P.E. of HDR. The weather on February 12 was overcast with temperatures between 15 and 25 degrees. The site was covered with light snow and rainfall/snow had not occurred within the 24 hours prior to the inspection.

2.1 Forebay and Retention Basin

The pool levels in the Forebay and Retention Basin were unknown at the time of inspection as there are no staff gauges installed for either pond. However, the ponds appeared to be operating at their normal pool levels of approximately El. 882.3 feet NAVD 88 for the Forebay and approximately El. 881.8 NAVD 88 for the Retention Basin.

The storage capacity of the Forebay is 933,000 cubic feet at approximate top of dike El. 884 NAVD 88, and the approximate volume of impounded water/CCR in the Forebay at the time of inspection (surface water level of El. 882.3 feet NAVD 88) was approximately 771,500 cubic feet (Ref. [6]).

The storage capacity of the Retention Basin is 1,298,000 cubic feet at approximate top of dike El. 885 NAVD 88 and the approximate volume of impounded water/CCR in the Retention Basin at the time of inspection (surface water level of El. 881.8 feet NAVD 88) was approximately 878,100 cubic feet (Ref. [6]).

The visual inspection was conducted in accordance with the CCR Final Rule to identify signs of distress or malfunction of the CCR unit and appurtenant structures and consisted of observations of features and conditions readily discernible by external visual inspection through reasonable efforts. Inspection Checklist Forms are provided in Appendix A. A discussion of the embankment conditions is presented in the following subsections and the terminology describing the embankment sections is shown in Figure 4.

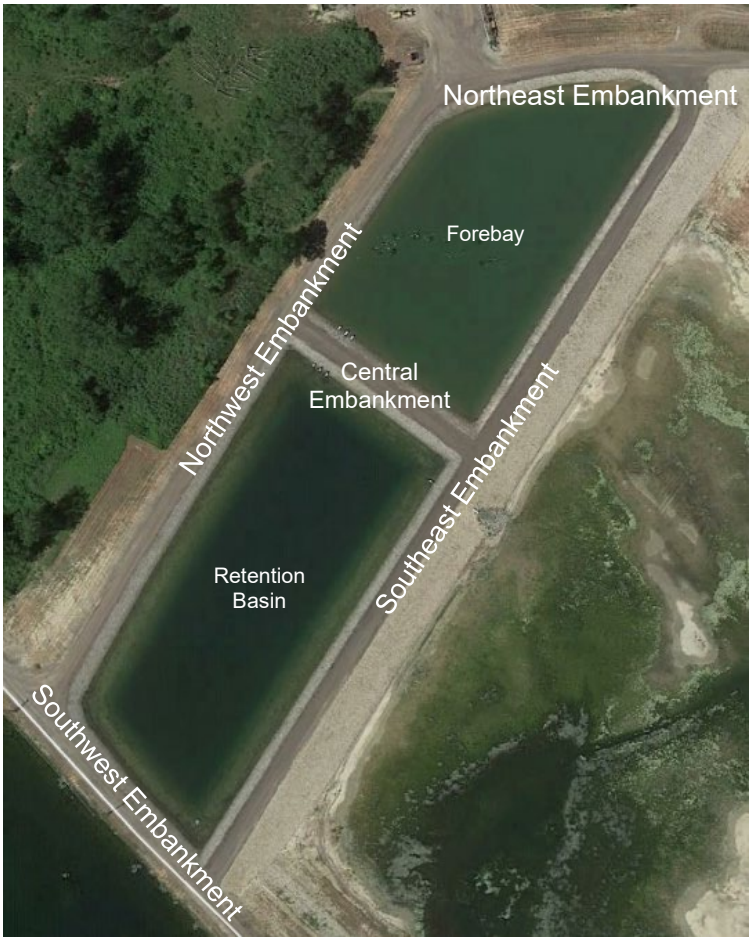


Figure 4. Forebay and Retention Basin Embankment Terminology

2.1.1 Southeast Embankment

The Southeast Embankment separates the Forebay and Retention Basin to the northwest and the Former Impoundment, which is closed, to the southeast. The Southeast Embankment appeared to be in good condition and no evidence of movement, settlement, cracking, distress, erosion, seepage, animal burrows or other adverse conditions was observed in the crest and upstream and downstream slopes.

Notes:

- The crest of the embankment consisted of a gravelly/soil surface. Minor rutting of the crest was observed.
- Rip-rap protects the interior and exterior slopes, which was in good condition.
- Vegetation has been maintained properly since the previous inspection.
- The vents installed as part of the liner system were visible, appeared to be in good condition, and were free of debris.

2.1.2 Northeast Embankment

The Northeast Embankment separates the Forebay to the southwest and the Hydro-Bins and grassy areas to the north. The Northeast Embankment appeared to be in good condition, and no evidence of movement, settlement, cracking, distress, erosion, seepage, animal burrows or other adverse conditions was observed.

Notes:

- Riprap protects the interior slope. The crest of the embankment consisted of a gravelly/soil surface. The crest and slopes appeared to be in good condition.
- Vegetation has been maintained properly since the previous inspection.

2.1.3 Northwest Embankment

The Northwest Embankment separates the Forebay and Retention Basin to the southeast and wooded areas to the northwest. The Northwest Embankment appeared to be in good condition, and no evidence of movement, settlement, cracking, distress, erosion, seepage, animal burrows or other adverse conditions was observed in the crest and upstream and downstream slopes.

Notes:

- Riprap protects the interior slope. The crest of the embankment consisted of a gravelly/soil surface. The crest and slopes appeared to be in good condition.
- The vents installed as part of the liner system were visible, appeared to be in good condition, and were free of debris.
- Vegetation has been maintained properly since the previous inspection.

2.1.4 Southwest Embankment

The Southwest Embankment separates the Retention Basin to the northeast and Lake Delta to the southwest. The Southwest Embankment appeared to be in good condition, and no evidence of movement, settlement, cracking, distress, erosion, seepage, animal burrows or other adverse conditions was observed in the crest and upstream and downstream slopes.

Notes:

- Riprap protects the interior slope and vegetation covers the exterior slope (adjacent to Lake Delta). The crest of the embankment consisted of a gravelly/soil surface. The crest and slopes appeared to be in good condition.
- Vegetation has been maintained properly since the previous inspection.

2.1.5 Intake/Outlet Structures

Forebay Influent Pipes

The Forebay Influent Pipes, located at the northeast corner of the Forebay, appeared to be in good condition. The pipes were submerged, and the interior could not be observed.

There was no evidence of settlement, sinkholes, or cracking in the area above the pipes extending through the Northeast Embankment.

Forebay Overflow

The Forebay Overflow pipes appeared to be in good condition. The pipes were partially submerged and the interior could not be observed during the visual inspection. There was no evidence of settlement, sinkholes, or cracking in the area above the pipes extending through the Central Embankment.

Former Impoundment Overflow

The Former Impoundment Overflow appeared to be in good condition. There was insignificant overflow entering the Former Impoundment Overflow from the Retention Basin at the time of the inspection. The pipe consists of 24-inch CPP, and the interior was observable at the time of the inspection and was clear of obstructions. There was no evidence of settlement, sinkholes, or cracking in the area above the Former Impoundment Overflow extending through the Southeast Embankment.

Retention Basin Overflow Structure

The Retention Basin Overflow Structure was submerged and not visible at the time of inspection. The trash rack installed to prevent debris from entering the overflow has been previously dislodged during a storm event and rests near the bank of the Retention Basin.

There was no evidence of settlement, sinkholes, or cracking in the area above the pipe extending through the Southeast embankment.

By-Pass Pipe

The by-pass pipe is buried and was not visible during the visual inspection.

There was no evidence of settlement, sinkholes, or cracking in the area of the embankment above the pipe extending through the Southwest Embankment.

Inspection of Submerged Structures

The CCR Final Rule requires that the annual inspection include a visual inspection of any 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. Visual inspections (either in the dewatered condition or via a remotely operated vehicle (ROV)) were not available for the buried or submerged pipes.

2.1.6 Instrumentation

As part of the hydrogeologic characterization study for Erickson Power Station, HDR installed several monitoring wells across the site to develop a groundwater monitoring network in 2019 and 2020 (Ref. [3]). Two of these monitoring wells (MW-3 and MW-4) were installed in the vicinity of the Forebay and Retention Basin as shown in Figure 5. The monitoring wells consist of 2-inch, Sch. 40 PVC risers. The monitoring well screen consists of 0.010-inch slots and is surrounded by a silica sand filter pack. Table 2-1 provides details for the two monitoring wells installed in the vicinity of the Forebay and Retention Basin.

Figure 5. Monitoring Well Locations

Table 2-1. Monitoring Well Details

Well	Elevation (TOC) (feet NAVD 88)	Well Stickup (feet)	Total Depth (feet)	Depth of Screen (feet)	Max. Static Water Elevation[1] (feet NAVD 88)
MW-3	884.81	-0.31	34.5	24-34	870.95
MW-4	889.15	3.92	28.0	18-28	876.01

1. Maximum level since previous inspection.

No other instrumentation is present at the Forebay and Retention Basin.

2.2 Clear Water Pond

According to the gauge attached to the Pump House, the Clear Water Pond reservoir was at approximately El. 882 feet NAVD 88 at the time of the inspection.

The approximate storage capacity of the Clear Water Pond is 1,843,000 cubic feet and the approximate volume of impounded water/CCR in the Clear Water Pond at the time of inspection (surface water level of El. 882 feet NAVD 88) was 1,129,000 cubic feet (Ref. [6]).

The visual inspection was conducted in accordance with the CCR Final Rule to identify signs of distress or malfunction of the CCR unit and appurtenant structures and consisted

of observations of features and conditions readily discernible by external visual inspection through reasonable efforts. The Inspection Checklist Form is provided in Appendix A. A discussion of the embankment conditions is presented in the following subsections and the terminology describing the embankment sections is shown in Figure 6.

Figure 6. Clear Water Pond Embankment Terminology

2.2.1 Southeast Embankment

The Southeast Embankment separates the Clear Water Pond to the northwest and the swale and railroad to the southeast. The Southeast Embankment appeared to be in good condition and no evidence of movement, settlement, cracking, distress, erosion, seepage, or other adverse conditions was observed in the crest and upstream and downstream slopes.

Notes:

- The crest of the embankment consisted of a gravelly/soil surface. Minor rutting of the crest was observed.
- Riprap protects the interior and exterior slopes, which was in good condition.
- There are several small diameter trees that are growing along the fence at the crest.
- Vegetation appears to have been maintained properly on both slopes of the embankment and at the exterior toe in the swale.

- A few small animal burrows were observed on the exterior slope of the embankment, outside of the fence.

2.2.2 North Embankment

The North Embankment separates the Clear Water Pond to the south and the Former Impoundment, which is closed, to the north. The North Embankment appeared to be in good condition and no evidence of movement, settlement, cracking, distress, erosion, seepage, animal burrows or other adverse conditions was observed in the crest and upstream and downstream slopes.

Notes:

- Vegetation appears to have been maintained properly on both sides of the embankment.
- There was evidence of sloughing on the interior slope of the North Embankment which was observed in previous inspections.
- Riprap protects the exterior slope (adjacent to the Former Impoundment) in several areas. The rip-rap extends to the crest of the exterior slope on the eastern portion of the North Embankment, whereas the rip-rap extends to a vegetated bench on the western portion of the North Embankment.
- The crest of the embankment consisted of a gravelly/soil surface. No evidence of movement, settlement, cracking, or other distress was observed in the crest other than minor rutting.

2.2.3 West Embankment

The West Embankment separates the Clear Water Pond to the east and Lake Delta to the west. The West Embankment appeared to be in good condition and no evidence of movement, settlement, cracking, distress, erosion, seepage, animal burrows or other adverse conditions was observed in the crest and upstream and downstream slopes.

Notes:

- Vegetation appears to have been maintained properly on both sides of the embankment.
- The crest of the embankment consisted of a gravelly/soil. No evidence of movement, settlement, cracking, or other distress was observed in the crest.

2.2.4 Intake/Outlet Structures

Lake Delta Drainage Structure

The Lake Delta Drainage Structure, located between the Clear Water Pond and Lake Delta, appeared to be in good condition. The concrete and walkway appeared to be in good condition. The pipe of the Lake Delta Drainage Structure is underground and could not be observed during the visual inspection. There was no evidence of settlement, sinkholes, or cracking in the area of the embankment above the pipe extending through the Clear Water Pond embankment.

Lake Delta Transfer Structure

The Lake Delta Transfer Structure, located between the Clear Water Pond and Lake Delta, appeared to be in good condition. At the time of inspection, stop logs were in place and level with the top of the overflow weir. The concrete and stop logs appeared to be in good condition. The pipe of the Lake Delta Transfer Structure is underground/submerged and could not be observed during the visual inspection. There was no evidence of settlement, sinkholes, or cracking in the area of the embankment above the pipe extending through the Clear Water Pond embankment.

Old Ash Impoundment Transfer Structure

The Old Ash Impoundment Transfer Structure, located between the Clear Water Pond and the Former Impoundment, appeared to be in good condition. The concrete of the structures appeared to be in good condition. The pipe of the Old Ash Impoundment Transfer Structure is underground/submerged and could not be observed during the visual inspection. There was no evidence of settlement, sinkholes, or cracking in the area of the embankment above the pipe extending through the Clear Water Pond embankment.

Old Ash Impoundment Drainage Structure

The Old Ash Impoundment Drainage Structure, located between the Clear Water Pond and the Former Impoundment, is inactive and not in use. According to BWL, the pipe valve is currently closed. The concrete of the structure appeared to be in good condition. The pipe of the Old Ash Impoundment Drainage Structure is underground and could not be observed during the visual inspection. There was no evidence of settlement, sinkholes, or cracking in the area of the embankment above the pipe extending through the Clear Water Pond embankment.

Emergency Overflow Structure

The Emergency Overflow Structure, located between the Clear Water Pond and the swale and railroad ROW, appeared to be in good condition. The outlet pipe appeared in good condition and no leaking, sediment, or flow of water was observed. There was no evidence of settlement, sinkholes, or cracking in the area of the embankment above the pipe extending through the Clear Water Pond embankment.

The outlet pipe is equipped with fencing to prevent animals from entering and vegetation was maintained around the outlet.

Grand River Discharge Pipe to Lake Delta

According to BWL, a pipe is present near the Clear Water Pond discharging water directly from the Grand River into Lake Delta. BWL states that this pipe is active however does not extend through the Clear Water Pond embankment as it is located underground northwest of the Pump House. HDR is unaware of the size, material, and alignment of this pipe.

Inspection of Submerged Structures

The CCR Final Rule requires that the annual inspection include a visual inspection of any 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. Visual

inspections (via remotely operated vehicle (ROV)) were not available for the buried or submerged pipes.

2.2.5 Instrumentation

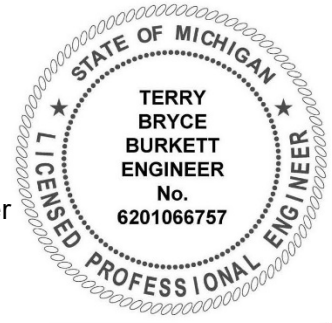
As part of the hydrogeologic characterization study for Erickson Power Station, HDR installed several monitoring wells across the site to develop a groundwater monitoring network in 2019 (Ref. [3]). One monitoring well, MW-1, was installed near the crest of the intersection of the West Embankment and the Southeast Embankment of the Clear Water Pond. The top of casing (2-inch, Sch. 40 PVC) of MW-1 was set at EL. 888.7 feet, with the ground surface at El. 886.0 feet, and the screen set between El. 866.0 and 856.0 feet. The maximum recorded groundwater elevation from MW-1 since the previous inspection was recorded at 877.82 feet.

Other instrumentation consists of gage boards at the Pump House, the Old Ash Impoundment Drainage Structure, and the Lake Delta Drainage Structure. The pond levels are monitored daily by the BWL operators. The gauge attached to the Pump House at the Clear Water Pond indicated the water surface was at approximately El. 882 feet NAVD 88 at the time of the inspection.

3 Closure

Based on the information provided to HDR by BWL, information available on BWL's CCR website, and HDR's visual observations and analyses, this 2021 Annual Inspection was conducted in accordance with the requirements of the USEPA 40 CFR Parts 257 and 261 Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, April 17, 2015 (CCR Final Rule). Based on the information currently available, I certify to the best of my knowledge, information and belief that this Annual Inspection of the Forebay, Retention Basin, and Clear Water Pond meets the requirements of CCR Rule §257.83(b) in accordance with professional standards of care for similar work. HDR appreciates the opportunity to assist BWL with this project. Please contact us if you have any questions or comments.

Bryce Burkett, P.E.
Senior Geotechnical Project Manager



27 Apr 2022

4 References

Ref. [1] Environmental Protection Agency, 40 CFR Parts 257 and 261; Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, Washington D.C., April 2015.

Ref. [2] GZA GeoEnvironmental, Inc. Draft Round 10 Dam Assessment Report, Lansing Board of Water & Light, Erickson Power Station, Ash Pond. April 30, 2012.

Ref. [3] HDR Engineering, Inc. Initial Inspection Report – Clear Water Pond, Lansing Board of Water & Light Erickson Power Station, Lansing, Michigan, June 12, 2020.

Ref. [4] HDR Engineering, Inc. Initial Inspection Report – Forebay and Retention Basin, Lansing Board of Water & Light Erickson Power Station, Lansing, Michigan, August 10, 2020.

Ref. [5] HDR Engineering, Inc. Monitoring Well Installation Report, Lansing Board of Water & Light Erickson Power Station, Lansing, Michigan, March 25, 2020.

Ref. [6] HDR Engineering, Inc. Inflow Design Flood Control System Plan, Erickson Power Station – CCR Surface Impoundments, Lansing Board of Water & Light, Lansing, Michigan, June 9, 2020.

Ref. [7] Mayotte Design & Engineering, P.C. Construction Documentation Report Ash Impoundment System Reconfiguration, Lansing Board of Water & Light Erickson Power Station, Lansing, Michigan, May 2015.

5 Appendices

Appendix A Inspection Checklists

APPENDIX A
INSPECTION CHECKLISTS

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name: Erickson Power Station	Date: February 12, 2021
Unit Name: Forebay	Operator's Name: Lansing Board of Water and Light
Unit I.D.: N/A	Hazard Potential Classification: **High** **Significant** (**Low**)
Inspector's Name: Bryce Burkett, P.E.	

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Weekly		18. Sloughing or bulging on slopes?		X
2. Pool elevation (operator records)?	882.3 ft		19. Major erosion or slope deterioration?		X
3. Decant inlet elevation (operator records)?	882.4 ft		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	N/A		Is water entering inlet, but not exiting outlet?		X
5. Lowest dam crest elevation (operator records)?	884.0 ft		Is water exiting outlet, but not entering inlet?		X
6. If instrumentation is present, are readings recorded (operator records)?	X		Is water exiting outlet flowing clear?		X
7. Is the embankment currently under construction?		X	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?	N/A		From underdrain?		X
9. Trees growing on embankment? (If so, indicate largest diameter below)		X	At isolated points on embankment slopes?		X
10. Cracks or scarps on crest?		X	At natural hillside in the embankment area?		X
11. Is there significant settlement along the crest?		X	Over widespread areas?		X
12. Are decant trash racks clear and in place?	N/A		From downstream foundation area?		X
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		X	"Boils" beneath stream or ponded water?		X
14. Clogged spillways, groin or diversion ditches?		X	Around the outside of the decant pipe?		X
15. Are spillway or ditch linings deteriorated?	N/A		22. Surface movements in valley bottom or on hillside?		X
16. Are outlets of decant or underdrains blocked?		X	23. Water against downstream toe?	X	
17. Cracks or scarps on slopes?		X	24. Were Photos taken during the dam inspection?		X

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue # Comments

1. Weekly inspection performed by BWL staff of CCR Impoundment System.

5. Elevation obtained from MD&E Construction Documentation Report.

6. Monitoring well readings (MW-3, MW-4, and MW-5) collected by HDR.

23. Water is on the downstream toe for the embankment bordering Former Impoundment.

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # N/A INSPECTOR Bryce Burkett, P.E.

Date February 12, 2021

Impoundment Name: Erickson Power Station – Forebay

Impoundment Company Lansing Board of Water and Light

EPA Region N/A

State Agency (Field Office) Address N/A

Name of Impoundment Erickson Power Station – Forebay

(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New _____ Update X

	Yes	No
Is impoundment currently under construction?		X
Is water or ccw currently being pumped into the impoundment?	X	

IMPOUNDMENT FUNCTION: Settling of ash and nutrient uptake by wetlands vegetation

Nearest Downstream Town: Name: Dimondale

Distance from the impoundment: 1.05 miles

Impoundment Location:

Longitude 84 Degrees 39 Minutes 19 Seconds

Latitude 42 Degrees 41 Minutes 20 Seconds

State MI County Eaton

Does a state agency regulate this impoundment? YES _____ NO x

If So, Which State Agency? N/A

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

_____ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

__x__ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

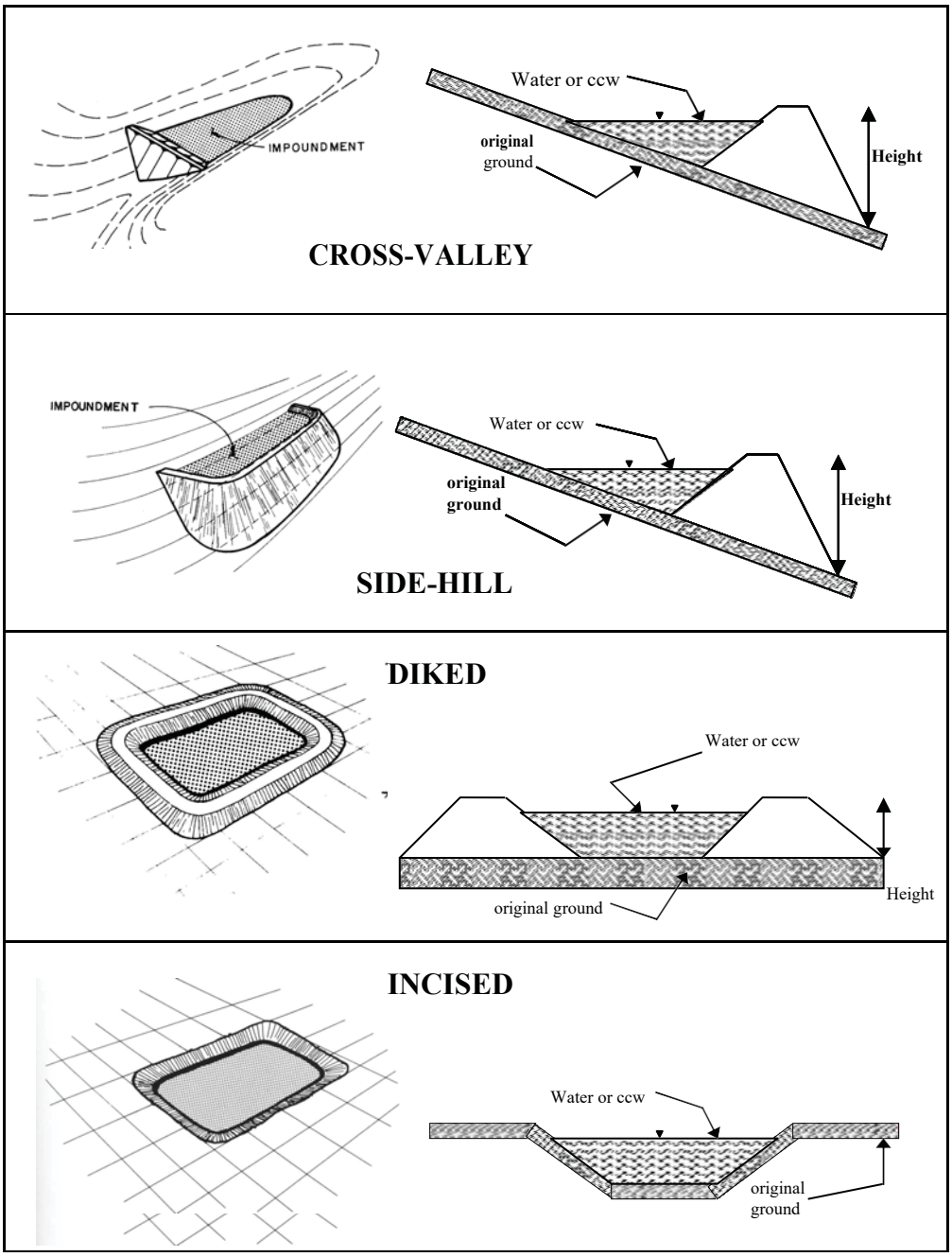
_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

Embankment failure would be limited primarily to owner's property with no probable loss of human life and low economic/environmental losses.

CONFIGURATION:



_____ Cross-Valley
_____ Side-Hill
__x__ Diked
_____ Incised (form completion optional)
_____ Combination Incised/Diked

Embankment Height 13 feet
Pool Area 2.7 acres
Current Freeboard 2 feet

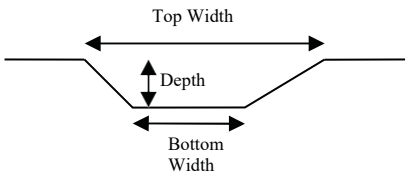
Embankment Material Compacted Clay
Liner geosynthetic clay (GCL) and 40 millimeter-thick FML
Liner Permeability unknown

TYPE OF OUTLET (Mark all that apply)

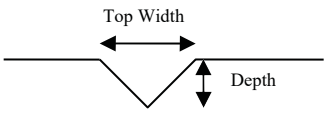
N/A **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

_____ depth
_____ bottom (or average) width
_____ top width
_____

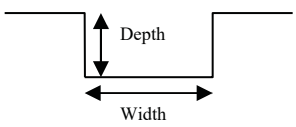
TRAPEZOIDAL



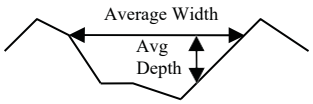
TRIANGULAR



RECTANGULAR

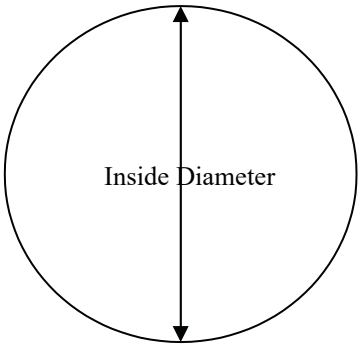


IRREGULAR



__3__ Outlets

__2 ft__ inside diameter



Material
_____ corrugated metal
_____ welded steel
_____ concrete
__x__ plastic (hdpe, pvc, etc.)
_____ other (specify) _____

_____

Is water flowing through the outlet? YES__x____ NO _____

_____ No Outlet

_____

_____ Other Type of Outlet (specify) _____

The Impoundment was Designed By: Mayotte Design & Engineering, P.C.

_____

Has there ever been a failure at this site? YES_____NO ___x_____

If So When? _____

If So Please Describe : _____

Has there ever been significant seepages at this site? YES_____NO __x__

If So When? _____

IF So Please Describe: _____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES_____NO___x____

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name: Erickson Power Station	Date: February 12, 2021
Unit Name: Retention Basin	Operator's Name: Lansing Board of Water and Light
Unit I.D.: N/A	Hazard Potential Classification: **High** **Significant** (**Low**)
Inspector's Name: Bryce Burkett, P.E.	

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Weekly		18. Sloughing or bulging on slopes?		X
2. Pool elevation (operator records)?	881.8 ft		19. Major erosion or slope deterioration?		X
3. Decant inlet elevation (operator records)?	880.5 ft		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	N/A		Is water entering inlet, but not exiting outlet?		X
5. Lowest dam crest elevation (operator records)?	885.0 ft		Is water exiting outlet, but not entering inlet?		X
6. If instrumentation is present, are readings recorded (operator records)?	X		Is water exiting outlet flowing clear?		X
7. Is the embankment currently under construction?		X	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?	N/A		From underdrain?		X
9. Trees growing on embankment? (If so, indicate largest diameter below)		X	At isolated points on embankment slopes?		X
10. Cracks or scarps on crest?		X	At natural hillside in the embankment area?		X
11. Is there significant settlement along the crest?		X	Over widespread areas?		X
12. Are decant trash racks clear and in place?		X	From downstream foundation area?		X
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		X	"Boils" beneath stream or ponded water?		X
14. Clogged spillways, groin or diversion ditches?		X	Around the outside of the decant pipe?		X
15. Are spillway or ditch linings deteriorated?	N/A		22. Surface movements in valley bottom or on hillside?		X
16. Are outlets of decant or underdrains blocked?		X	23. Water against downstream toe?	X	
17. Cracks or scarps on slopes?		X	24. Were Photos taken during the dam inspection?		X

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue # Comments

1. Weekly inspection performed by BWL staff of CCR Impoundment System.

5. Elevation obtained from MD&E Construction Documentation Report.

6. Monitoring well readings (MW-3, MW-4, and MW-5) collected by HDR.

12. Trash rack for overflow structure has been dislodged and is resting near bank of impoundment.

23. Water is on the downstream toe for the embankment bordering Former Impoundment and Lake Delta.

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # N/A INSPECTOR Bryce Burkett, P.E.

Date February 12, 2021

Impoundment Name: Erickson Power Station – Retention Basin
Impoundment Company Lansing Board of Water and Light

EPA Region N/A
State Agency (Field Office) Address N/A

Name of Impoundment Erickson Power Station – Retention Basin

(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New _____ Update X

	Yes	No
Is impoundment currently under construction?		X
Is water or ccw currently being pumped into the impoundment?	X	

IMPOUNDMENT FUNCTION: Settling of ash and nutrient uptake by wetlands vegetation

Nearest Downstream Town: Name: Dimondale
Distance from the impoundment: 1.05 miles
Impoundment Location: Longitude 84 Degrees 39 Minutes 16 Seconds
Latitude 42 Degrees 41 Minutes 21 Seconds

State MI County Eaton

Does a state agency regulate this impoundment? YES _____ NO x

If So, Which State Agency? N/A

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

_____ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

__x__ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

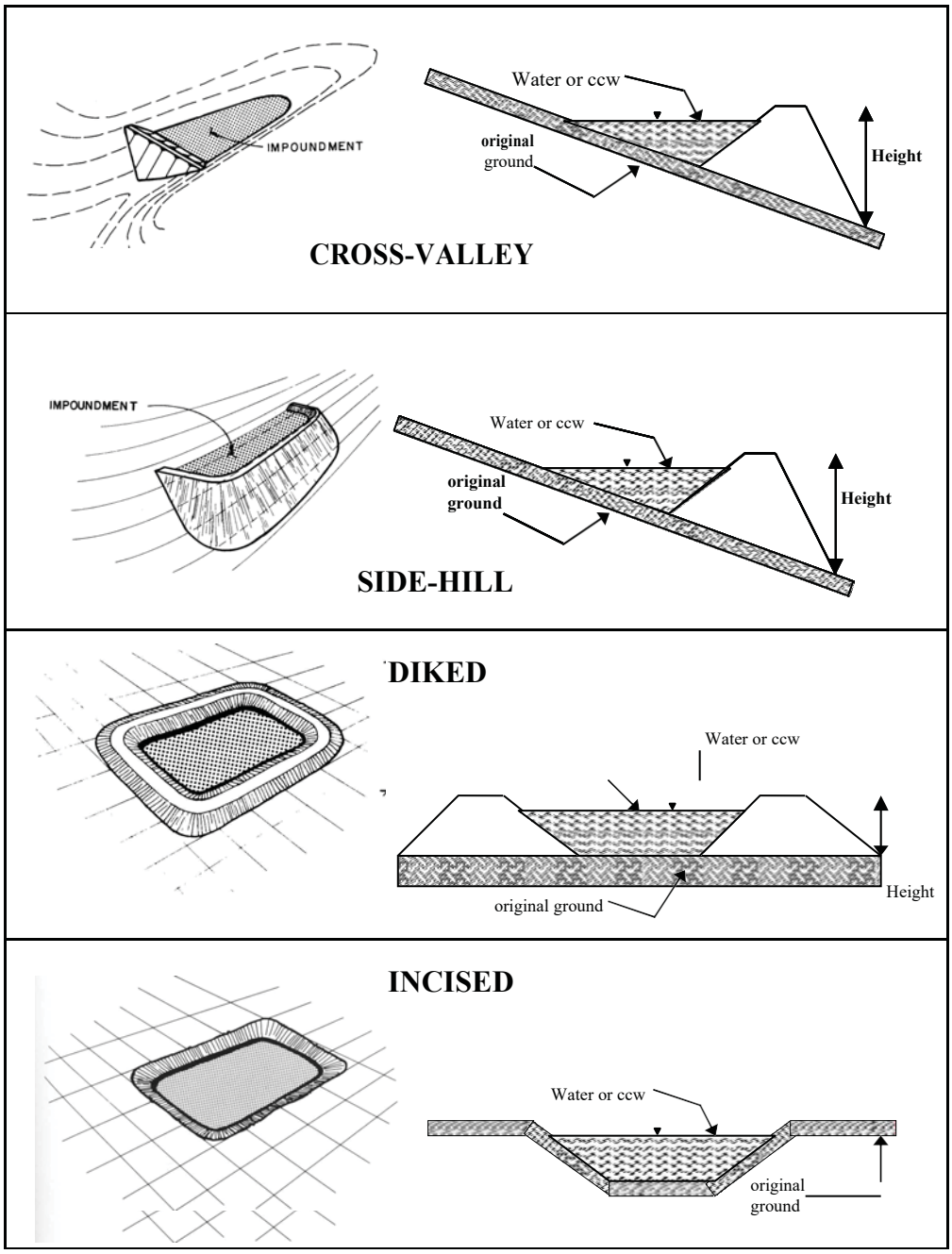
_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

Embankment failure would be limited primarily to owner's property with no probable loss of human life and low economic/environmental losses.

CONFIGURATION:



_____ Cross-Valley
_____ Side-Hill
__x__ Diked
_____ Incised (form completion optional)
_____ Combination Incised/Diked

Embankment Height ____14____ feet
Pool Area ____3.6____ acres

Current Freeboard ___3-4___ feet

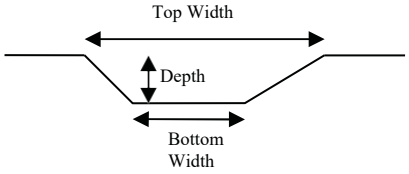
Embankment Material ___Compacted Clay___
Liner ___geosynthetic clay (GCL) and 40 millimeter-thick FML___

Liner Permeability ___unknown___

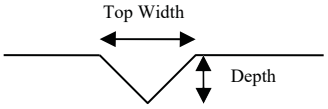
TYPE OF OUTLET (Mark all that apply)

N/A **Open Channel Spillway**

TRAPEZOIDAL



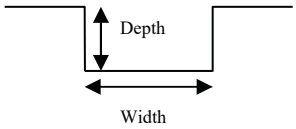
TRIANGULAR



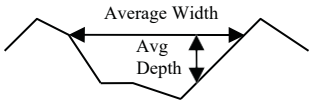
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

_____ depth
_____ bottom (or average) width
_____ top width

RECTANGULAR



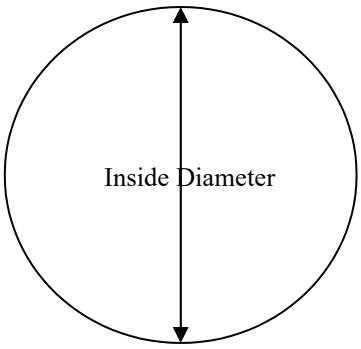
IRREGULAR



2 Outlets

6 ft inside diameter

2 ft inside diameter



Material
_____ corrugated metal
_____ welded steel
x concrete
x plastic (hdpe, pvc, etc.)
_____ other (specify) _____

Is water flowing through the outlet? YES x NO _____

_____ **No Outlet**

_____ **Other Type of Outlet** (specify) _____

The Impoundment was Designed By: Mayotte Design & Engineering, P.C.

Has there ever been a failure at this site? YES_____NO ___x_____

If So When? _____

If So Please Describe : _____

Has there ever been significant seepages at this site? YES_____NO __x__

If So When? _____

IF So Please Describe: _____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES_____NO___x____

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name: Erickson Power Station	Date: February 12, 2021
Unit Name: Clear Water Pond	Operator's Name: Lansing Board of Water and Light
Unit I.D.: N/A	Hazard Potential Classification: **High** **Significant** (**Low**)
Inspector's Name: Bryce Burkett, P.E.	

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Weekly		18. Sloughing or bulging on slopes?	X	
2. Pool elevation (operator records)?	881.8 ft		19. Major erosion or slope deterioration?		X
3. Decant inlet elevation (operator records)?	883.0 ft		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	N/A		Is water entering inlet, but not exiting outlet?		X
5. Lowest dam crest elevation (operator records)?	884.1 ft		Is water exiting outlet, but not entering inlet?		X
6. If instrumentation is present, are readings recorded (operator records)?	X		Is water exiting outlet flowing clear?		X
7. Is the embankment currently under construction?		X	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?	N/A		From underdrain?		X
9. Trees growing on embankment? (If so, indicate largest diameter below)	X		At isolated points on embankment slopes?		X
10. Cracks or scarps on crest?		X	At natural hillside in the embankment area?		X
11. Is there significant settlement along the crest?		X	Over widespread areas?		X
12. Are decant trash racks clear and in place?		X	From downstream foundation area?		X
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		X	"Boils" beneath stream or ponded water?		X
14. Clogged spillways, groin or diversion ditches?		X	Around the outside of the decant pipe?		X
15. Are spillway or ditch linings deteriorated?	N/A		22. Surface movements in valley bottom or on hillside?		X
16. Are outlets of decant or underdrains blocked?	N/A		23. Water against downstream toe?	X	
17. Cracks or scarps on slopes?		X	24. Were Photos taken during the dam inspection?		X

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue # Comments

1. Weekly inspection performed by BWL staff of CCR Impoundment System.

5. Lowest elevation obtained from 2018 topographic survey.

6. Monitoring well readings (MW-1) collected by HDR.

9. Trees growing along fence row on southeast embankment. Largest diameter = 2-inches.

12. No trash rack present for decant outlet at emergency overflow.

16. Decant outlets are submerged and not able to be observed during inspection.

18. Some sloughing occurring on interior slopes.

20. Decant inlet/outlet were viewable for Emergency Outfall Structure. Decants connected to Lake Delta and Former Impoundment were submerged and not observed.

23. Water is on the downstream toe for the embankment bordering Lake Delta and the embankment bordering the former 28-acre impoundment.

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # N/A INSPECTOR Bryce Burkett, P.E.

Date February 12, 2021

Impoundment Name: Erickson Power Station – Clear Water Pond

Impoundment Company Lansing Board of Water and Light

EPA Region N/A

State Agency (Field Office) Address N/A

Name of Impoundment Erickson Power Station – Clear Water Pond

(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New _____ Update X

	Yes	No
Is impoundment currently under construction?		X
Is water or ccw currently being pumped into the impoundment?	X	

IMPOUNDMENT FUNCTION: Temporary storage of water for plant reuse

Nearest Downstream Town: Name: Dimondale

Distance from the impoundment: 1.05 miles

Impoundment Location:

Longitude 84 Degrees 39 Minutes 17 Seconds

Latitude 42 Degrees 41 Minutes 8 Seconds

State MI County Eaton

Does a state agency regulate this impoundment? YES _____ NO x

If So, Which State Agency? N/A

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

_____ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

__x__ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

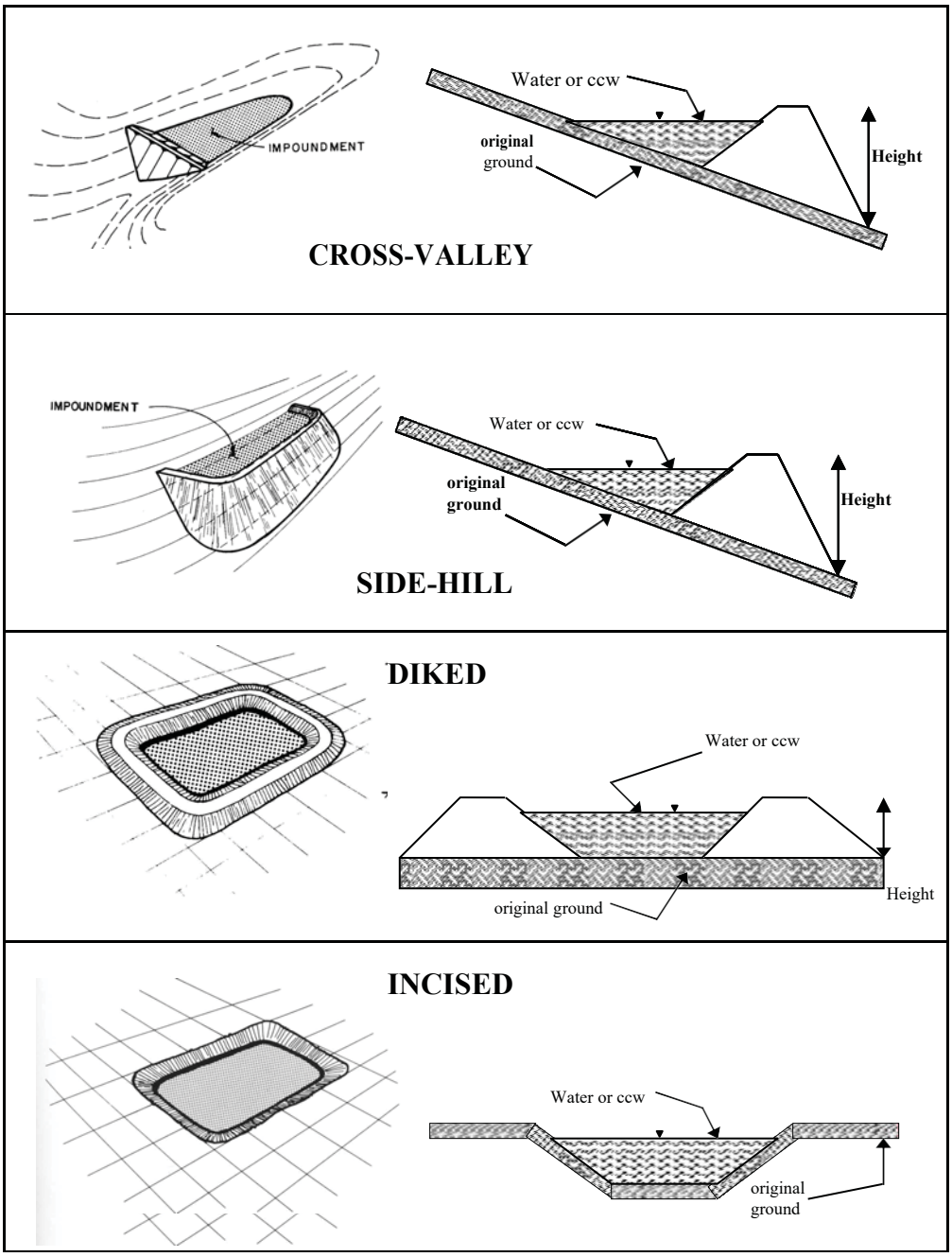
_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

Embankment failure would be limited primarily to owner's property with no probable loss of human life and low economic/environmental losses.

CONFIGURATION:



_____ Cross-Valley
_____ Side-Hill
__x__ Diked
_____ Incised (form completion optional)
_____ Combination Incised/Diked

Embankment Height 12-14 feet
Pool Area 3.7 acres
Current Freeboard 2-4 feet

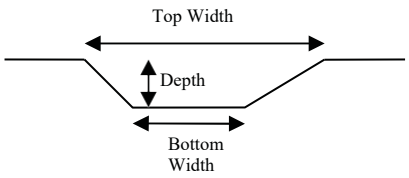
Embankment Material Compacted Clay
Liner Compacted Clay
Liner Permeability unknown

TYPE OF OUTLET (Mark all that apply)

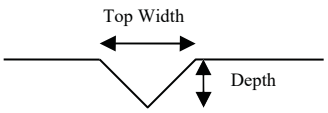
N/A **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

_____ depth
_____ bottom (or average) width
_____ top width

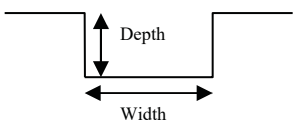
TRAPEZOIDAL



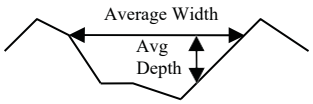
TRIANGULAR



RECTANGULAR

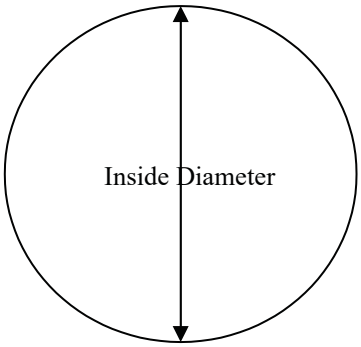


IRREGULAR



x Outlet

3 ft inside diameter



Material
_____ corrugated metal
_____ welded steel
_____ concrete
_____ plastic (hdpe, pvc, etc.)
x other (specify) Ductile iron

Is water flowing through the outlet? YES_____ NO x

_____ **No Outlet**

_____ **Other Type of Outlet** (specify) _____

The Impoundment was Designed By: Stanley Consultants

Has there ever been a failure at this site? YES_____NO ___x_____

If So When? _____

If So Please Describe : _____

Has there ever been significant seepages at this site? YES_____NO __x__

If So When? _____

IF So Please Describe: _____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES_____NO___x____

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____