Hazard Potential Classification Assessment Report

For Compliance with the EPA Coal Combustion Residuals (CCR) Rule 40 CFR 257.83(a)(2)

Erickson Power Station

Forebay, Retention Basin, & Clear Water Pond

June 19, 2020

Prepared for:
Lansing Board of Water and Light
Erickson Power Station
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Contents

Tables

Figures

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1 Introduction and Purpose

HDR MICHIGAN, Inc. (HDR) has prepared this Hazard Potential Classification Assessment 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(a)(2) requires that owners or operators document the hazard potential classification of each CCR unit as either a high hazard potential CCR surface impoundment, a significant hazard potential CCR surface impoundment, or a low hazard potential CCR surface impoundment. Additionally, CCR Rule 40 CFR §257.73(a)(2) requires that the owner or operator must also document the basis for each hazard potential classification.

The Hazard Potential Classification Assessment Report presented herein addresses the specific requirements of 40 CFR §257.73(a)(2). This Hazard Potential Classification Assessment Report was prepared by Mr. Bryce Burkett, P.E., and was reviewed in accordance with HDR's internal review policy by Mr. Adam N. Jones, P.E., both of HDR. 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 site vicinity map, Figure 1.

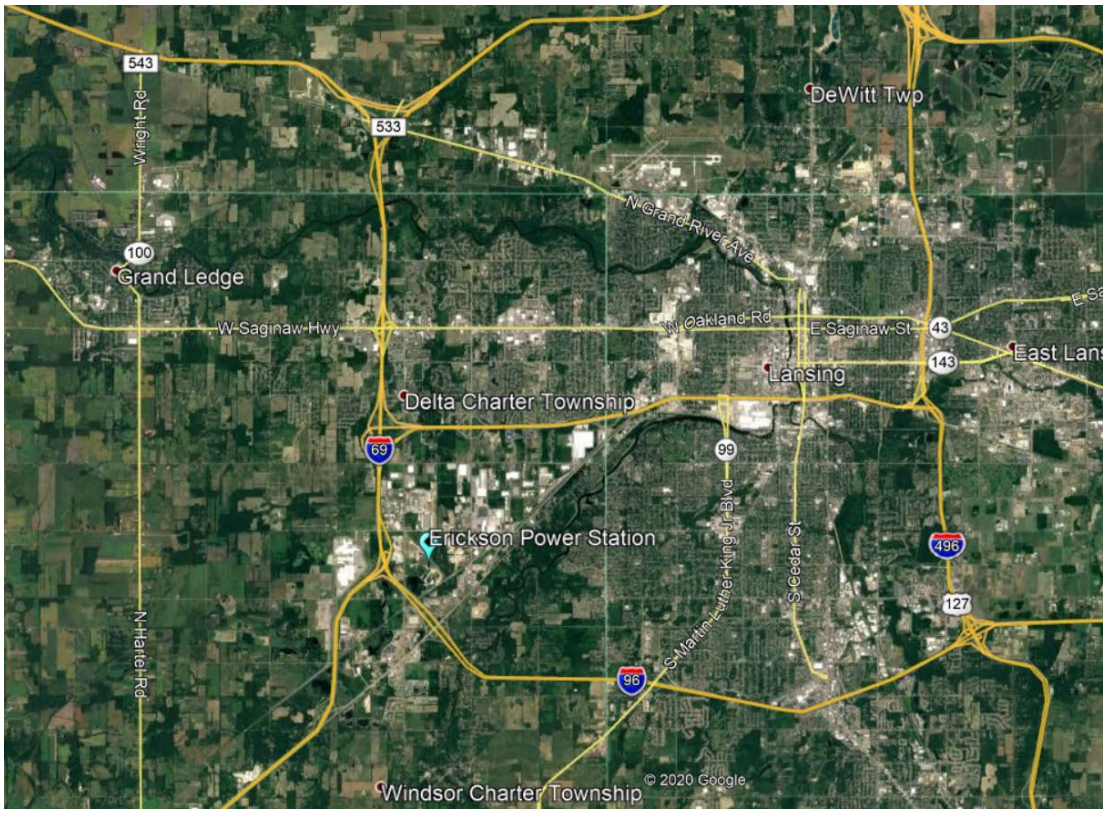

Figure 1. Site Vicinity Map

1.2 Site Description

Erickson Power Station was constructed starting in 1970, was completed in 1973, and is scheduled to close in 2025 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. [4]) was installed. The Forebay and Retention Basin were installed within the footprint of the excavated Former Impoundment and cover approximately 5-acres, leaving the Former Impoundment with a surface area of approximately 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.

Figure 2 displays the Erickson Power Station site configuration, including the current and former impoundment system.

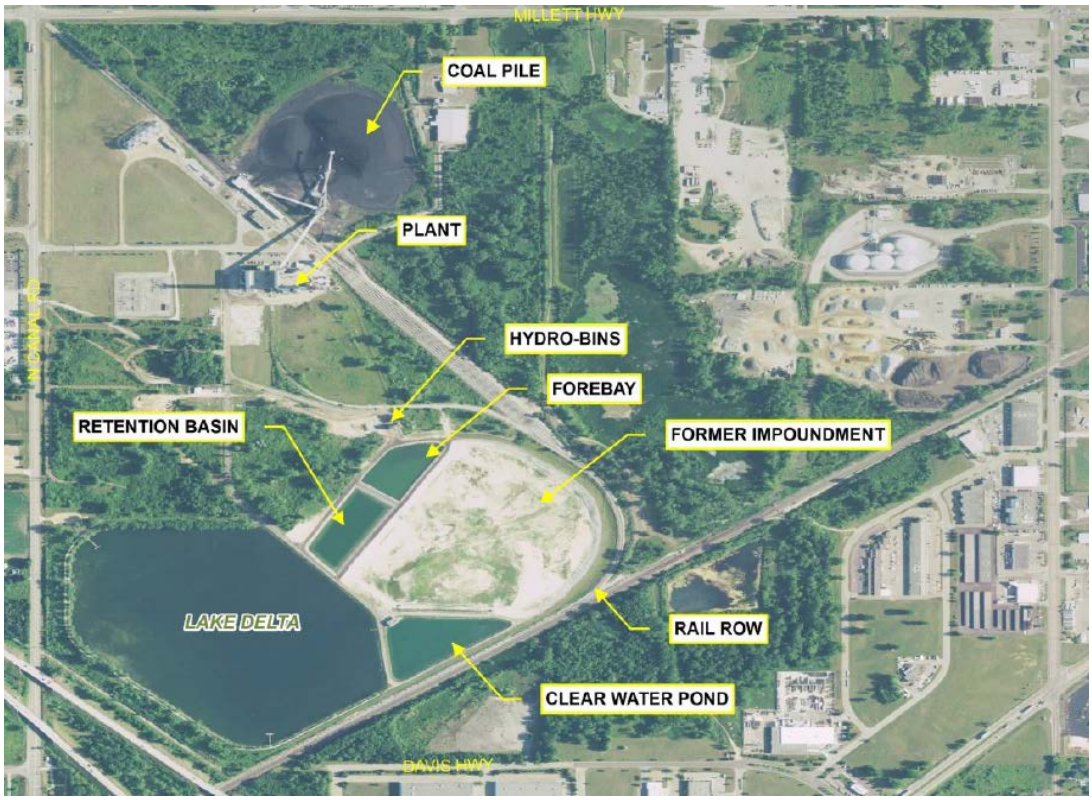

Figure 2. Erickson Power Station Site Configuration

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

Figure 3. Google Earth® Image of Impoundment System

1.3 Hazard Potential Classification

The EPA defines the hazard potential classifications as follows:

- High hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.
- Significant hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.
- Low hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of life and low economic and/or environmental losses. Losses are principally limited to the surface impoundment's owner's property.

1.3.1 Forebay

The Forebay is an existing CCR surface impoundment at Erickson Power Station which was constructed from 2014 to 2015 as part of the reconfiguration of the surface impoundment system for Erickson Power Station (Ref. [4]).

The Forebay collects plant water directly from Erickson Power Station through a gang of three water mains: two 10-inch mains and one 6-inch main with inverts of El. 881.6 feet NAVD88[1] located at the northeast corner of the Forebay. Water flows from northeast to southwest across the Forebay and exits the Forebay through three 24-inch diameter outfall pipes with inverts of El. 882.4 to 882.6 feet NAVD88, which transfer water to the Retention Basin. The perimeter embankment of the Forebay separates the Forebay from the Former Impoundment to the southeast, the Retention Basin to the southwest, and the BWL property to the northwest and northeast. The maximum storage volume of the Forebay at the maximum pool elevation of approximately El. 884.0 feet is approximately 21.4 acre-feet (Ref. [3]). The bottom elevation of the Forebay is approximately El. 871.5 feet NAVD88. A summary of the Forebay storage volumes are presented in Table 1.

Table 1. Forebay Summary

Surface Impoundment	Bottom of Pond Elevation (feet)	Top of Embankment Elevation (feet)	Scenario	Water Surface Elevation (feet)	Storage Volume (acre-feet)
Forebay	871.5	884.0	Normal	882.3	17.5
			Maximum Storage	884.0	21.4
Note: Elevations are referenced to NAVD88					

If the perimeter embankment of the Forebay fails, the CCR from the surface impoundment will discharge into either 1) the Former Impoundment, 2) the Retention Basin, or 3) into the swale adjacent to the northwest and northeast embankments. No probable loss of

[1] North American Vertical Datum of 1988.

human life, low economic/environmental damage, and no disruption of lifeline facilities are expected during this scenario. Losses from this scenario would be principally limited to BWL property. Therefore, the Forebay has been determined to have a low hazard potential classification.

1.3.2 Retention Basin

The Retention Basin is an existing CCR surface impoundment at Erickson Power Station which was constructed from 2014 to 2015 as part of the reconfiguration of the surface impoundment system for Erickson Power Station (Ref. [4]).

The Retention Basin collects water from the Forebay through three 24-inch diameter outfall pipes with inverts of El. 881.4 to 881.7 feet NAVD88 located at the northeast embankment of the Retention Basin. Water flows from northeast to southwest across the Retention Basin and exits the Retention Basin through a 72-inch diameter overflow riser pipe structure located at the southwest corner of the Retention Basin with an invert of El. 880.5 feet NAVD88. The overflow structure then transfers water through a 36-inch diameter corrugated plastic pipe (CPP) to the Retention Transfer Structure, then the Old Ash Impoundment Transfer Structure, and ultimately the Clear Water Pond. The perimeter embankment of the Retention Basin separates the Retention Basin from the Former Impoundment to the southeast, the Forebay to the northeast, Lake Delta to the southwest, and the BWL property to the northwest. Lake Delta is a man-made 44-acre lake that is occasionally used to supply Erickson Power Station with make-up water. It is not considered a CCR Impoundment. The maximum storage volume of the Retention Basin at the maximum pool elevation of approximately El. 885.0 is approximately 29.8 acre-feet (Ref. [3]). The bottom elevation of the Retention Basin is at approximately El. 871.5 feet NAVD88. A summary of the Retention Basin storage volumes are presented in Table 2.

Table 2. Retention Basin Summary

Surface Impoundment	Bottom of Pond Elevation (feet)	Top of Embankment Elevation (feet)	Scenario	Water Surface Elevation (feet)	Storage Volume (acre-feet)
Retention Basin	871.5	885.0	Normal	881.5	19.3
			Maximum Storage	885.0	29.8
Note: Elevations reported in NAVD88					

If the perimeter embankment of the Retention Basin fails, the CCR from the surface impoundment will discharge into either 1) the Former Impoundment, 2) the Forebay, 3) Lake Delta, or 4) into the swale adjacent to the northwest embankment. No probable loss of human life, low economic/environmental damage, and no disruption of lifeline facilities are expected during this scenario. Losses from this scenario would be principally limited to BWL property. Therefore, the Retention Basin has been determined to have a low hazard potential classification.

1.3.3 Clear Water Pond

The Clear Water Pond is an existing CCR surface impoundment at Erickson Power Station which was originally constructed starting in 1970 and was completed in 1973 as part of the original construction Erickson Power Station.

The Clear Water Pond collects water from the Retention Basin through the Retention Basin Transfer Structure and then Old Ash Impoundment Transfer Structure, with an invert of approximately El. 871.4 feet NAVD88 located at the north embankment of the Clear Water Pond. The Clear Water Pond is used to provide a storage basin for water prior to recycling it back to Erickson Power Station via the Pump House located on the northwest corner of Clear Water Pond.

The perimeter embankment of the Clear Water Pond separates the Clear Water Pond from the Former Impoundment to the north, Lake Delta to the southwest, and the swale adjacent to the railroad right of way to the northeast. The storage volume of the Clear Water Pond at the normal pool elevation of approximately El. 881.7 feet NAVD88 is approximately 24.9 acre-feet. The bottom elevation of the Clear Water Pond is at approximately El. 873 feet NAVD88.

A previous hazard potential classification was documented by GZA GeoEnvironmental, Inc. (GZA) for the Erickson Power Station Ash Pond in 2011 and a report, referred to as a Round 10 Dam Assessment, was issued in 2012 (Ref. [2]). The GZA 2012 assessment report was prepared for the EPA[2]. The GZA 2012 report addressed the Ash Pond which was undergoing closure at the time of the assessment. As discussed in Section 1.2 of this report, the Ash Pond has since been closed is currently referred to as the Former Impoundment. The assessment by GZA was performed for the previous impoundment system, which consisted of the Ash Pond and Clear Water Pond, as the assessment report in 2012 was performed prior to the construction of the Forebay and the Retention Basin.

The GZA 2012 report states that the Department of Environmental Quality (DEQ), currently known as the Department of Environment, Great Lakes, and Energy (EGLE), assigned the Ash Pond as a low hazard potential rating (Section 1.2.7 of Ref. [2]), in which GZA concurred as *"failure or mis operation would result in no probable loss of human life and low economic or environmental losses. Any economic or environmental losses would be primarily limited to the Erickson Station property."*

Reviewing the previous hazard potential classification assigned by the DEQ/EGLE and GZA for the Ash Pond, it is HDR's interpretation that the Clear Water Pond was included in the impoundment system for which the low hazard potential classification was assigned.

[2] GeoEnvironmental, Inc. (GZA) contracted with the EPA, Contract No. EP10W001313, Order No. EP-B11S-00049. The purpose of the contract was to provide the EPA with a site-specific inspection of the impoundments to assist EPA in assessing the structural stability of the impoundments under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act Section 104(e).

2 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 Hazard Potential Classification Assessment 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 Hazard Potential Classification Assessment meets the requirements of CCR Rule §257.73(a)(2) 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

19 June 2020

Adam Jones, P.E.
Engineering Manager

3 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. Inflow Design Flood Control System Plan, Erickson Power Station – CCR Surface Impoundments, Lansing Board of Water & Light, Lansing, Michigan, June 9, 2020.

Ref. [4] Mayotte Design & Engineering, P.C. Construction Documentation Report Ash Impoundment System Reconfiguration, Lansing Board of Water & Light Erickson Power Station, Lansing, Michigan, May 2015.