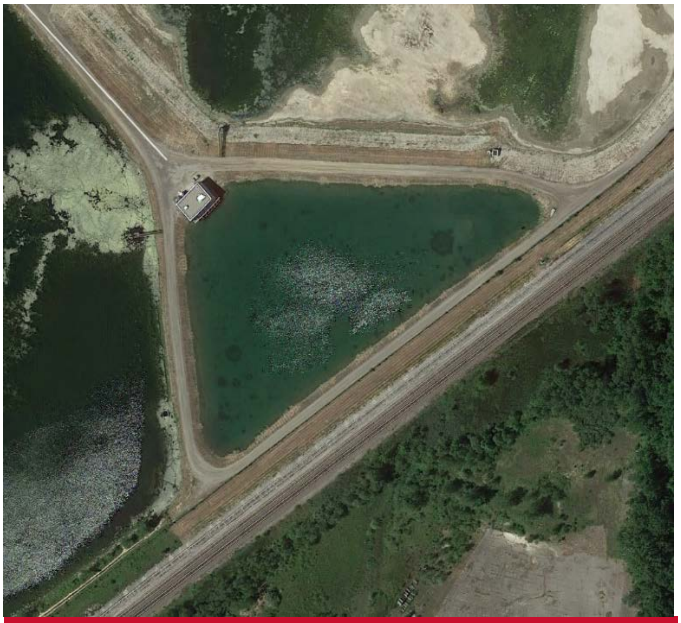

Initial Inspection Report

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

Erickson Power Station – Clear Water Pond

June 12, 2020

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

Prepared by:
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Contents

Figures

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1 Introduction and Purpose

HDR MICHIGAN, Inc. (HDR) has prepared this Initial Inspection Report for the 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 existing 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 initial inspection for the Clear Water Pond.

The Initial Inspection Report presented herein addresses the specific requirements of 40 CFR 257.83(b). This Initial Inspection 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 vicinity map, Figure 1.

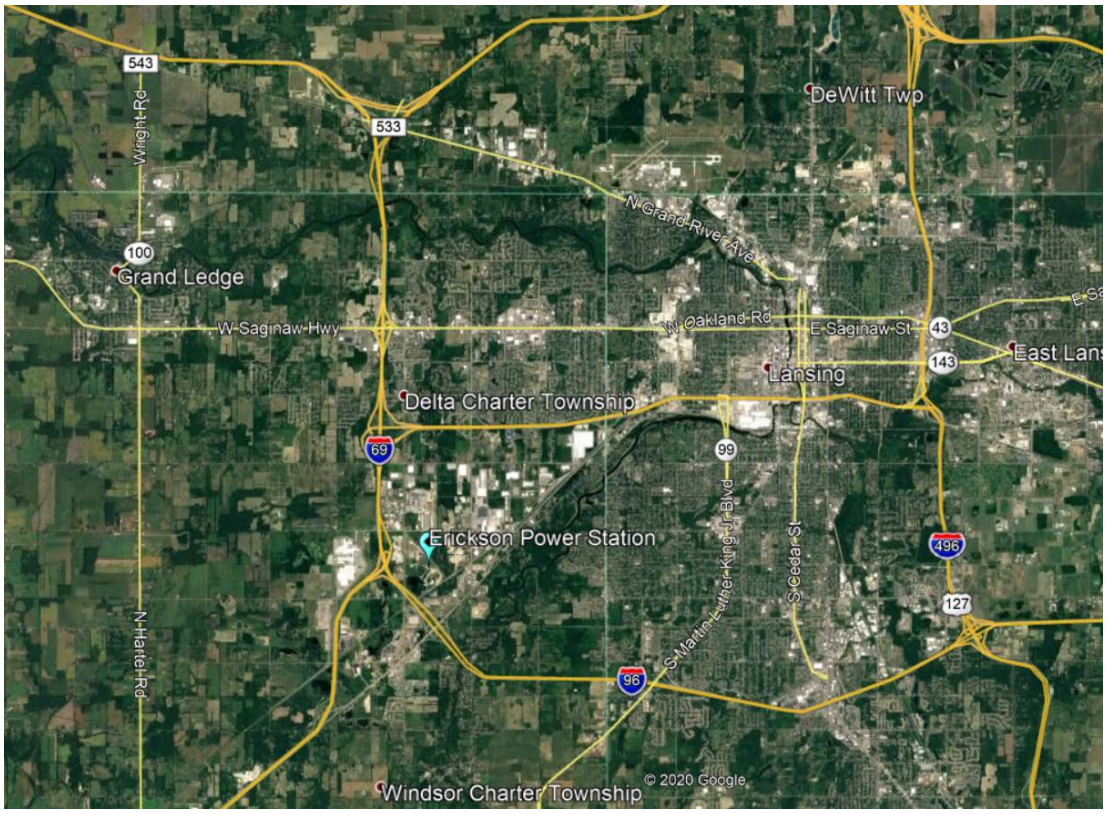


Figure 1. Site Vicinity Map

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. [5]) 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 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[1]).

There is an Emergency Overflow Structure located in the Clear Water Pond. The overflow structure consists of a 36-inch ductile iron pipe set at El. 883.0 feet NAVD 88. In the event of an emergency overflow, water would enter the overflow structure and discharge to a swale that directs flow north to Carrier Creek, then north to Holly Drain, then to Clements Underhill Drain, and ultimately to the Grand River.

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

Figure 2. Erickson Power Station Site Configuration

Figure 3 presents a Google Earth view looking 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.

[1] North American Vertical Datum of 1988

Figure 3. Google Earth Image of Impoundment System

The Clear Water Pond has five hydraulic structures that extend through the embankment:

- Lake Delta Drainage Structure
- Lake Delta Transfer Structure
- Old Ash Impoundment Transfer Structure
- Old Ash Impoundment Drainage Structure
- Emergency Overflow Structure

Figure 4 (Ref. [6]) displays a plan view of the Clear Water Pond with the locations of the associated hydraulic structures and pipes extending through the embankment. Note that the elevations presented in Figure 4 (Ref. [6]) presents survey information referenced to NGVD 29[2] and NAVD 88.

[2] National Geodetic Vertical Datum of 1929

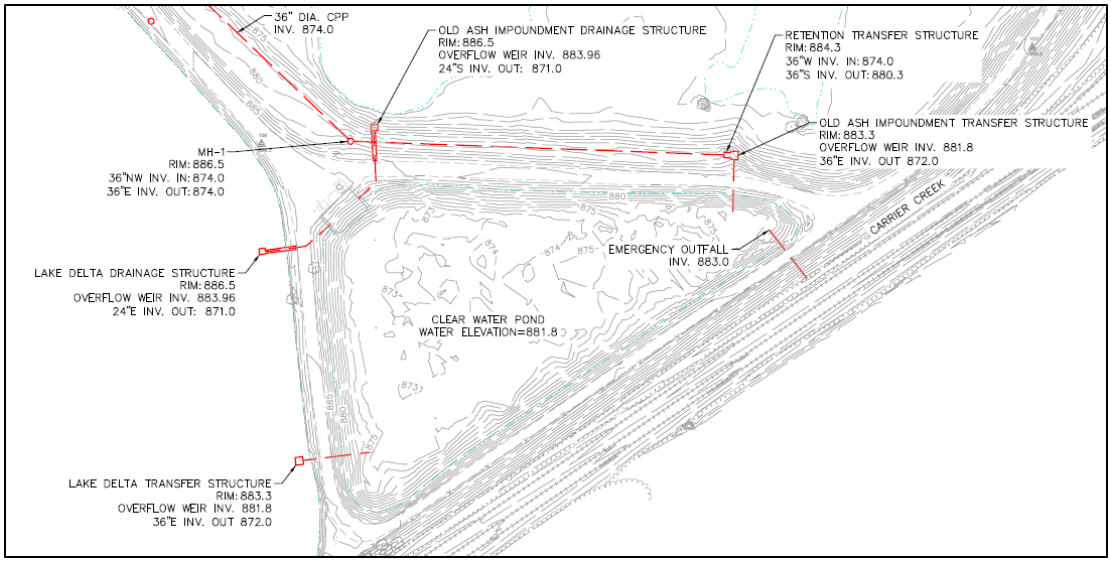


Figure 4. Location of Clear Water Pond Hydraulic Structures

The following provides details of each hydraulic structure located at the Clear Water Pond. It should be noted that elevations presented in this report were provided by a survey performed by BWL on May 7, 2020, along with a review of the existing elevations presented in reports provided by BWL.

Lake Delta Drainage Structure

The Lake Delta Drainage Structure is located between the Clear Water Pond and Lake Delta. Water from Lake Delta flows through the drainage structure (extending through the Clear Water Pond embankment) to the Pump House where it is sent to Erickson Power Station to use. The discharge pipe consists of 24-inch ductile iron pipe, equipped with square, (6-feet x 6-feet) concrete, anti-seep collars. HDR understands that this drainage structure is active and commonly in use.

The invert of the overflow weir is at approximately El. 883.6 feet NAVD 88 and the invert of the outlet is at approximately El. 870.4 feet NAVD 88.

Lake Delta Transfer Structure

The Lake Delta Transfer Structure is located between the Clear Water Pond and Lake Delta. Water from Lake Delta flows over the overflow weir through the discharge pipe extending through the Clear Water Pond embankment and into the Clear Water Pond. The discharge pipe consists of 36-inch ductile iron pipe, equipped with square, (8-feet x 8-feet) concrete, anti-seep collars. Stop logs are in place to the top of the overflow weir, preventing hydraulic connection between Lake Delta and the Clear Water Pond.

The invert of the overflow weir is at approximately El. 881.9 feet NAVD 88 and the invert of the outlet is at approximately El. 871.4 feet NAVD 88.

Old Ash Impoundment Transfer Structure

The Old Ash Impoundment Transfer Structure is located between the Clear Water Pond and the Former Impoundment. Water from the Retention Basin flows through piping to the Retention Transfer Structure, which is then transferred to the Old Ash Impoundment Transfer Structure which then flows through the pipe extending through the Clear Water

Pond embankment and in to the Clear Water Pond. The piping extending through the Clear Water Pond embankment consists of 36-inch ductile iron pipe, equipped with square, (8-feet x 8-feet) concrete, anti-seep collars. This structure provides the only active water intake to the Clear Water Pond.

The invert of the overflow weir is at approximately El. 880.3 feet NAVD 88 and the invert of the outlet is at approximately El. 871.4 feet NAVD 88.

Old Ash Impoundment Drainage Structure

The Old Ash Impoundment Drainage Structure is located between the Clear Water Pond and the Former Impoundment. The Old Ash Impoundment Drainage Structure was designed to transfer water from the Former Impoundment to the Pump House. The Old Ash Impoundment Drainage Structure is inactive and is not in use. The piping extending through the Clear Water Pond embankment consists of 24-inch ductile iron pipe, equipped with square, (8-feet x 8-feet) concrete, anti-seep collars. According to BWL, the valve of the pipe is currently closed.

Emergency Overflow Structure

The Emergency Overflow Structure is located between the Clear Water Pond and a swale adjacent to the railroad right-of-way (ROW). The Emergency Overflow Structure was designed to allow water to discharge through the pipe extending through the Clear Water Pond embankment in an overflow event of the Clear Water Pond and exit into the swale. The pipe consists of 36-inch ductile iron pipe, equipped with square, (8-feet x 8-feet) concrete, anti-seep collars.

The top of the inlet of the Emergency Overflow Structure was repaired by BWL (approx. May 2017) due to corrosion/deterioration of the pipe. The invert of the overflow pipe is at approximately El. 883.0 feet NAVD 88 and the invert of the outlet pipe is at approximately EL. 873.1 feet NAVD 88. The outlet pipe is equipped with fencing to prevent animals from entering and vegetation was maintained around the outlet.

According to BWL, an overflow event has not occurred in the Clear Water Pond and the Emergency Overflow Structure has yet to be used for discharge.

1.3 Previous Assessments and Inspections

A previous assessment was performed 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 detailing the findings from the assessment in 2012 (Ref. [2]). The GZA 2012 report was performed for 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. A site visit was conducted for GZA 2012 on May 19, 2011. The GZA 2012 report includes discussion and details of the Clear Water Pond. An additional inspection of the Former Impoundment was performed in 2009 by Inspecsol Engineering, Inc. as noted in GZA 2012, however, that report was not available for review.

BWL performs weekly inspections for 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 Clear Water Pond during previous inspections.

There are no records of previous inspections that have been performed for the Clear Water Pond embankment.

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 March 19, 2020 by Bryce Burkett, P.E. of HDR. Cheryl Louden of BWL accompanied HDR during the inspection. According to the gauge attached to the Pump House, the Clear Water Pond reservoir was at approximately El. 882 feet (datum unknown) at the time of the inspection. The weather on March 19 was overcast with temperatures between 40 and 50 degrees. Light rain had occurred within the 24 hours prior to the inspection, totaling less than 0.05-inch.

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) was 1,134,000 cubic feet (Ref. [4]).

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. Relevant photographs with the corresponding photograph locations are provided in Appendix A and the Inspection Checklist Form is provided in

Appendix B. A discussion of the embankment conditions is presented in the following subsections and the terminology describing the embankment sections is shown in Figure 5.

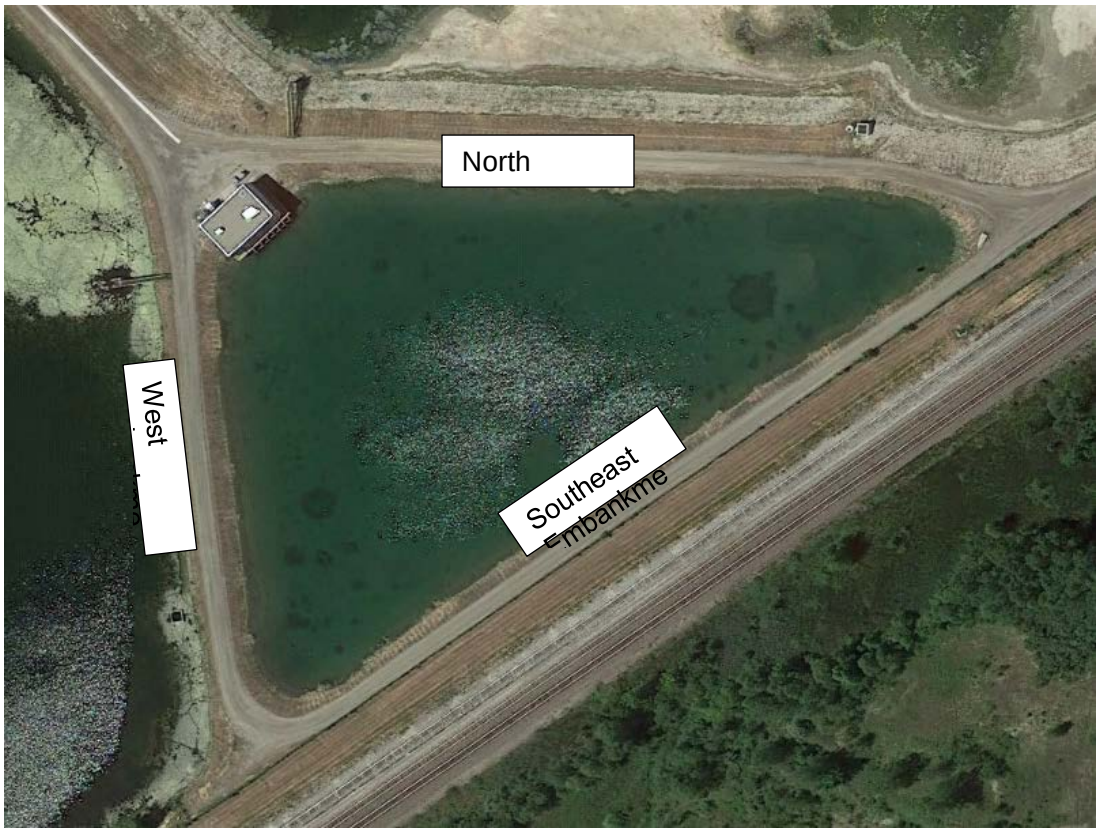


Figure 5. Clear Water Pond Embankment Terminology

2.1.1 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 (Photos 1 through 10), except as noted herein. Vegetation appears to have been maintained properly on both slopes of the embankment and at the exterior toe in the swale. A fence runs along the crest of the Southeast Embankment (Photos 1 through 4). There are several small diameter trees that are growing along the fence at the crest (Photos 3, 4, and 6).

There were a few small animal burrows (Photos 9 and 10). Three burrows were observed on the exterior slope of the embankment, outside of the fence.

The crest of the embankment consisted of a gravelly/soil surface (Photos 1 through 4). No evidence of movement, settlement, cracking, or other distress was observed in the crest, other than rutting, as seen in Photo 11.

There was no other evidence of instability, deformation, sinkholes, cracking, burrows, or leakage observed for the Southeast Embankment.

2.1.2 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 (Photos 11 through 22), except as noted below. 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 (Photos 11 and 17). There was an animal burrow (Photo 14) on the exterior slope of the embankment adjacent to the Former Impoundment.

Rip-rap 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 (Photo 12), whereas the rip-rap extends to a vegetated bench on the western portion of the North Embankment (Photos 15 and 18).

The crest of the embankment consisted of a gravelly/soil surface (Photos 11 through 13). No evidence of movement, settlement, cracking, or other distress was observed in the crest.

There was no other evidence of instability, deformation, sinkholes, cracking, burrows, or leakage observed for the North Embankment.

2.1.3 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 (Photos 23 through 28), except as noted below. Vegetation appears to have been maintained properly on both sides of the embankment.

The crest of the embankment consisted of a gravelly/soil surface (Photos 23, 25, and 26). No evidence of movement, settlement, cracking, or other distress was observed in the crest.

There was no evidence of instability, deformation, sinkholes, cracking, burrows, or leakage observed for the West Embankment.

2.1.4 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 (Photos 21 and 23). Water from Lake Delta flows through the drainage structure through the Pump House where it is sent to Erickson Power Station for use. The discharge pipe consists of 24-inch ductile iron pipe, equipped with square, (6-feet x 6-feet) concrete, anti-seep collars. Note that anti-seep collars were common practice at the time the embankment was constructed but have since been found to increase the potential for seepage and internal erosion. 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 (Photos 27 and 28). Water from Lake Delta flows over the overflow weir and into the Clear Water Pond and is operated by a valve which 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 discharge pipe consists of 36-inch ductile iron pipe, equipped with square, (8-feet x 8-feet) concrete, anti-seep collars. 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 (Photo 16). Water from the Retention Basin flows through piping to the Retention Transfer Structure, which is then transferred to the Old Ash Impoundment Transfer Structure which then flows to the Clear Water Pond. The piping extending through the Clear Water Pond embankment consists of 36-inch ductile iron pipe, equipped with square, (8-feet x 8-feet) concrete, anti-seep collars. 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 (Photo 21), located between the Clear Water Pond and the Former Impoundment, is inactive and not in use. The piping extending through the Clear Water Pond embankment consists of 24-inch ductile iron pipe, equipped with square, (8-feet x 8-feet) concrete, anti-seep collars. 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 (Photo 5 and 6). The overflow of the Clear Water Pond flows through the pipe and exits into the swale through an elbow in the pipe in the downstream direction (Photo 7). The pipe consists of 36-inch ductile iron pipe, equipped with square, (8-feet x 8-feet) concrete, anti-seep collars.

The top of the inlet (Photo 5) of the Emergency Overflow Structure was repaired by BWL (approx. May 2017) due to corrosion/deterioration of the pipe. 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. The fencing was installed on the outlet pipe as recommended in the GZA 2012 report (Ref. [2]).

Grand River Discharge Pipe to Lake Delta

According to BWL, a pipe is present near the Clear Water Pond (Photo 24) 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 and is not shown on Figure 4.

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.

2.1.5 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 monitoring well screen consists of 0.010-inch slots and is surrounded by a silica sand filter pack. Groundwater elevation readings were taken over a three month period between October and December in 2019, with the groundwater elevation in MW-1 ranging between 874.1 to 874.5 feet (Ref. [3]).

Other instrumentation consists of gage boards at the Pump House (Photo 20), the Old Ash Impoundment Drainage Structure (Photo 21), and the Lake Delta Drainage Structure (Photo 25). 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 (datum unknown), with a corresponding Plant Datum of El. 101, at the time of the inspection (Photo 20).

2.2 Additional Observations

Dark circular areas are observable in Figure 6, taken from the satellite image of the Clear Water Pond. HDR is not aware of underground pipes or other factors which would contribute to these areas within the Clear Water Pond basin. The dark circular areas were not observed during HDR's site visit, though the base of the basin could not be viewed.

Figure 6. Aerial View of Clear Water Pond

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 Initial 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 Initial Inspection of the 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

STATE OF MICHIGAN
TERRY BRYCE BURKETT
ENGINEER
No. 6201066757
LICENSED PROFESSIONAL ENGINEER

12 June 2020

Adam Jones, P.E.
Engineering Manager

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. Groundwater Monitoring 2019 Annual Report, Lansing Board of Water & Light Erickson Power Station, Lansing, Michigan, January 30, 2020.

Ref. [4] 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. [5] Mayotte Design & Engineering, P.C. Construction Documentation Report Ash Impoundment System Reconfiguration, Lansing Board of Water & Light Erickson Power Station, Lansing, Michigan, May 2015.

Ref. [6] NTH Consultants, Ltd. Closure Plan, CCR Surface Impoundment System, Erickson Power Station. August 16, 2019.

5 Appendices

Appendix A Site Visit Photographs
Appendix B Inspection Checklist

APPENDIX A
SITE VISIT PHOTOGRAPHS

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Clear Water Pond Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: March 19, 2020

Photograph No. 1

Description:
Interior slope of Southeast Embankment and fence.

Photograph No. 2

Description:
Monitoring Well 1 (MW-1) installed in 2019.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Clear Water Pond Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: March 19, 2020

Photograph No. 3

Description:
Exterior slope of Southeast Embankment, fence and Rail Road.

Photograph No. 4

Description:
Interior slope of Southeast Embankment and Emergency Overflow Structure in the distance.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Clear Water Pond Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: March 19, 2020

Photograph No. 5

Description:
Emergency Overflow Structure (inlet). Note welded extension added to the structure to repair leaks.

Photograph No. 6

Description:
Exterior slope of Southeast Embankment and Emergency Overflow Structure (outlet).

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Clear Water Pond Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: March 19, 2020

Photograph No. 7

Description:
Emergency Overflow Structure (outlet).

Photograph No. 8

Description:
Exterior slope of Southeast Embankment.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Clear Water Pond Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: March 19, 2020

Photograph No. 9

Description:
Animal burrows in exterior slope of Southeast Embankment.

Photograph No. 10

Description:
Exterior slope of Southeast Embankment. Note animal burrow.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Clear Water Pond Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: March 19, 2020

Photograph No. 11

Description:
North Embankment and Pump House in distance. Note sloughing in the interior slope. Note slight elevation drop along crest of North Embankment. Retention Transfer Structure and Old Ash Impoundment Transfer Structure to the right of the photo.

Photograph No. 12

Description:
Exterior slope of North Embankment and water ponding in Former Impoundment. Not rip rap protection.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Clear Water Pond Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: March 19, 2020

Photograph No. 13

Description:
North Embankment and Transfer Structure. Retention Transfer Structure and Old Ash Impoundment Transfer Structure to the right of the photo.

Photograph No. 14

Description:
Animal burrow in exterior slope of North Embankment.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Clear Water Pond Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: March 19, 2020

Photograph No. 15

Description:
Exterior slope of North Embankment. Note bench in the exterior slope.

Photograph No. 16

Description:
Retention Transfer Structure (Left) and Old Ash Impoundment Transfer Structure (Right) with Former Impoundment in background.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Clear Water Pond Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: March 19, 2020

Photograph No. 17

Description:
Interior slope of North Embankment. Note minor sloughing on interior slope.

Photograph No. 18

Description:
Exterior slope bench of North Embankment.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Clear Water Pond Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: March 19, 2020

Photograph No. 19

Description:
Interior slope of North Embankment and Pump House.

Photograph No. 20

Description:
Pump house. Note red staff gauge attached to Pump House (red arrow identifying gauge).

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Clear Water Pond Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: March 19, 2020

Photograph No. 21

Description:
Former Impoundment Drainage Structure (no longer in use) on the exterior slope of North Embankment.

Photograph No. 22

Description:
Exterior slope of North Embankment. Manhole part of water transfer from Retention Pond to Retention Transfer Structure. Note <u>inactive</u> pipe previously used to pump water from Grand River to Former Impoundment. Note possible animal burrow.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Clear Water Pond Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: March 19, 2020

Photograph No. 23

Description:
Exterior slope of West Embankment and Lake Delta Drainage Structure. Lake Delta is to the right of the photograph.

Photograph No. 24

Description:
Submerged pipe outlet in Lake Delta. This pipe is currently active and feeds water via a pump station operated by BWL from Grand River to Lake Delta.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Clear Water Pond Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: March 19, 2020

Photograph No. 25

Description:
Lake Delta Drainage Structure and regulating valve.

Photograph No. 26

Description:
Interior slope of West Embankment.

Client Name:	Site Location:	Photographic Log
Lansing Board of Water and Light	Clear Water Pond Erickson Power Station Lansing, Michigan	Project No. 10173187 Date: March 19, 2020

Photograph No. 27

Description:
Exterior slope of West Embankment and Lake Delta Transfer Structure.

Photograph No. 28

Description:
Lake Delta Transfer Structure. Note stop logs in place.

APPENDIX B
INSPECTION CHECKLIST

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name: Erickson Power Station	Date: March 19, 2020
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)?	872.0 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
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
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 March 19, 2020

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 x Update _____

	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.

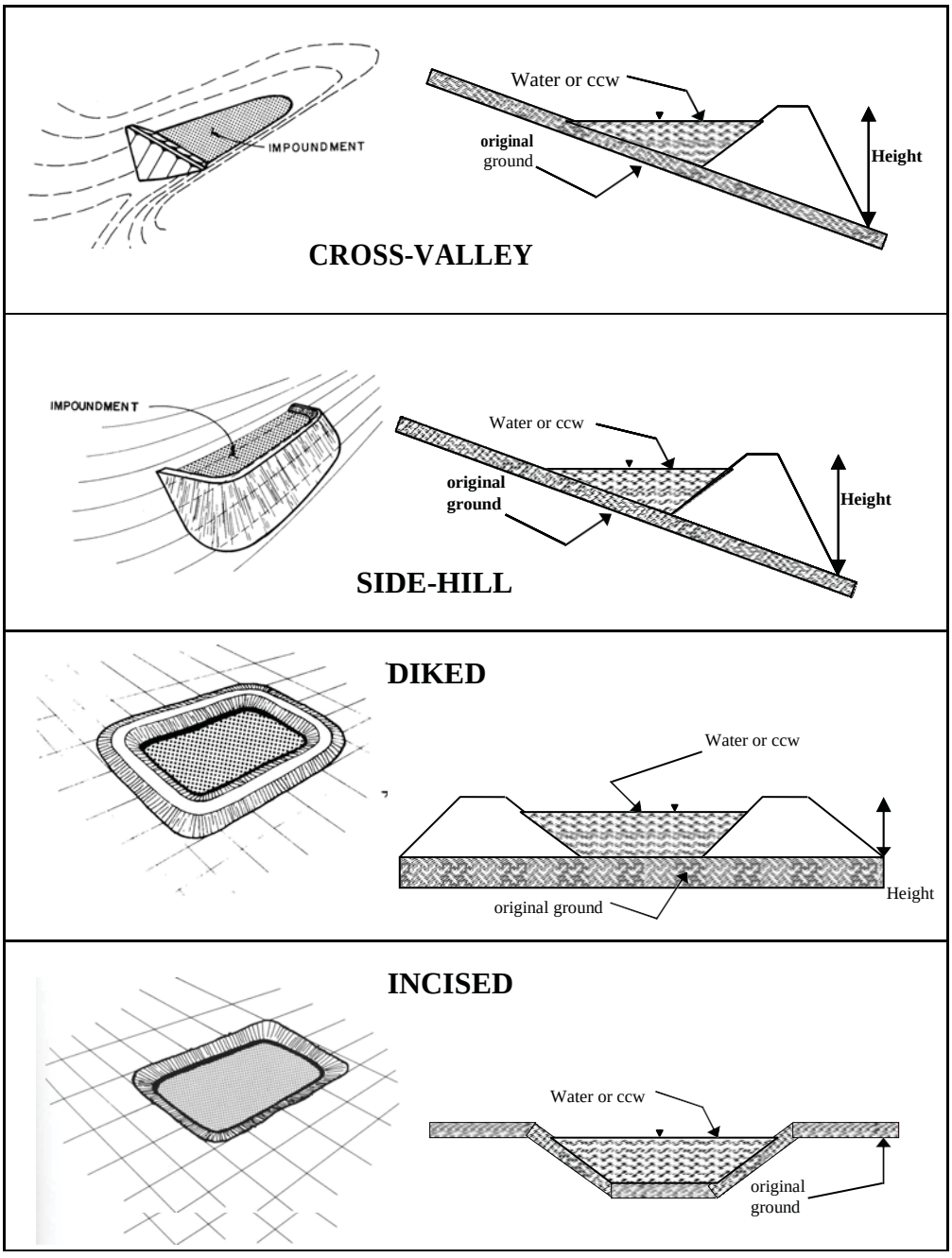
_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. 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

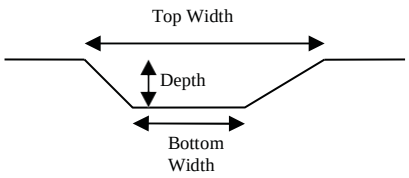
Embankment Material Compacted Clay
Liner Compacted Clay
Liner Permeability unknown

TYPE OF OUTLET (Mark all that apply)

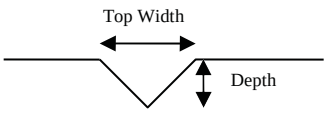
N/A **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

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

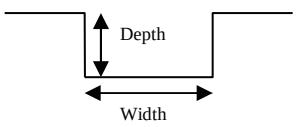
TRAPEZOIDAL



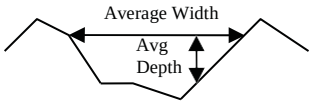
TRIANGULAR



RECTANGULAR

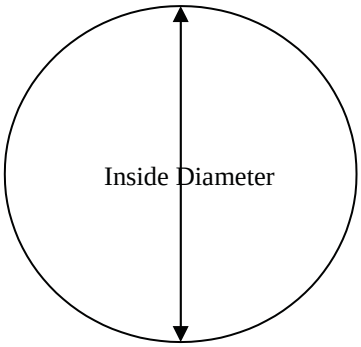


IRREGULAR



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 : _____