



**Grand Haven Board
of Light and Power**

J.B. Sims Generating
Station
Coal Combustion Residuals
Impoundments Closure
Update: October 15, 2020

AGENDA

1. Update of the JB Sims Site Conditions
2. Update on Closure Activities & Corrective Actions Taken since April 2020.
3. Status of the Surface Impoundment Unit 3 East and West CCR Closure
4. Evaluation of the Surface Impoundment for Unit 1/2
5. Recommendation for Steps Forward – Closure Strategy
6. Summary

The Board hired Soils & Structures and Environmental Resource Management in 2014 for studies involving ash on Harbor Island and began groundwater monitoring collection.

The Board hired Golder Associates in 2017 for assistance with CCR compliance, reporting, record keeping, and closure



[Information available on public website](#)

<https://ghblp.org/about-us/reports/ccr-rule-compliance-data-and-information/>

2020 Annual Groundwater Monitoring & Corrective Action Report will be submitted by January 30, 2021.

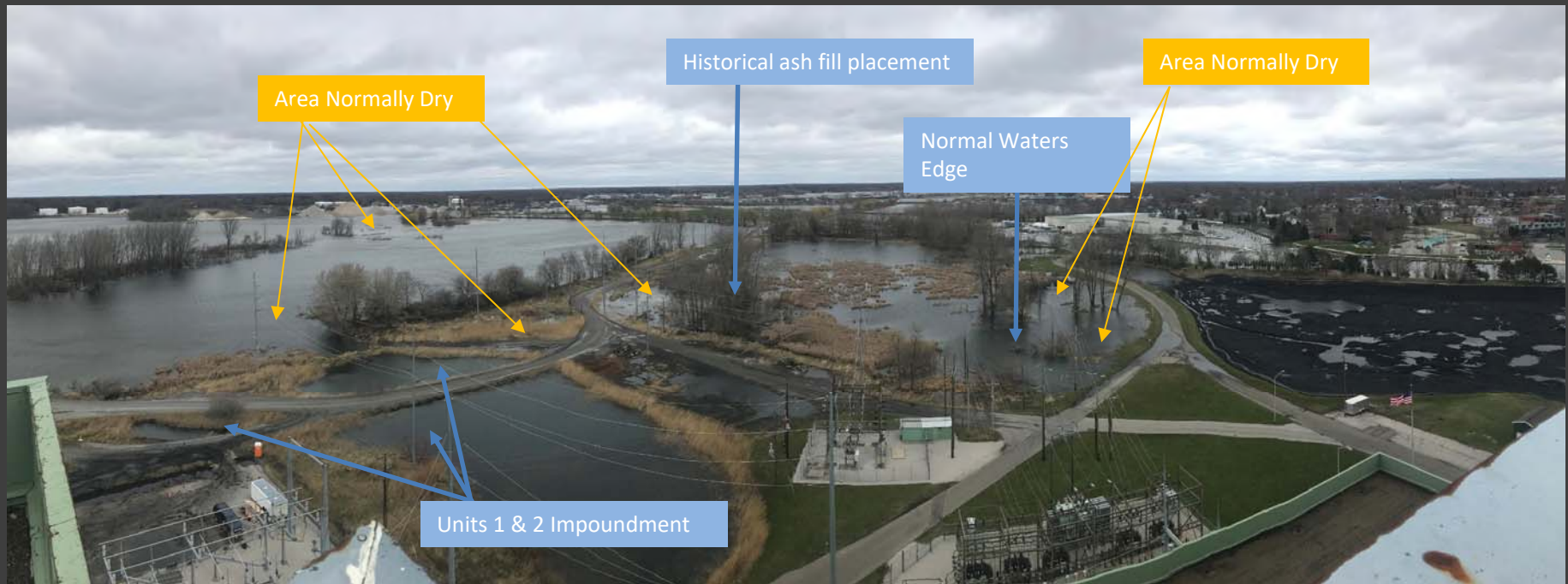
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- Cessation of CCR Placement and Initiation of Closure Activities in Unit 3 East and West Impoundments
- 2020 Holding Pond Annual Inspection Report
- 2020 Annual Update to the No Alternative Disposal Capacity Documentation
- Permanent Cessation of Boiler Operations Notification
- 2019 Annual Groundwater Monitoring and Corrective Action Report
- Closure Plan Pursuant To 40 CFR 257.102 Units 1 and 2 Inactive Ash Impoundments and Unit 3 Active East and West Ash Impoundments
- 2019 Holding Pond Annual Inspection Report
- No Alternate Disposal Capacity Documentation Report
- Location Restrictions Certification Report
- 2018 Annual Groundwater Monitoring & Corrective Action Report
- Notice of Initiating Assessment of Corrective Measures
- 2018 Holding Pond Annual Inspection Report
- Statistical Analysis Plan
- Groundwater Monitoring Network Certification
- 2016 Holding Pond Annual Inspection Report
- Fugitive Dust Control Plan
 - 2016 Fugitive Dust Control Annual Report
 - 2017 Fugitive Dust Control Annual Report
 - 2018 Fugitive Dust Control Annual Report
 - 2019 Fugitive Dust Control Annual Report
- CCR Initial Hazard Potential Classification
- Emergency Action Plan
- Revised Flood Control System
- Revised Documentation of Linear Report
- Revised Closure Plan
- 2017 Holding Pond Annual Inspection Report
- 2017 Annual Groundwater Monitoring and Corrective Action Report
- Notice of Assessment



1. Update on Site Conditions

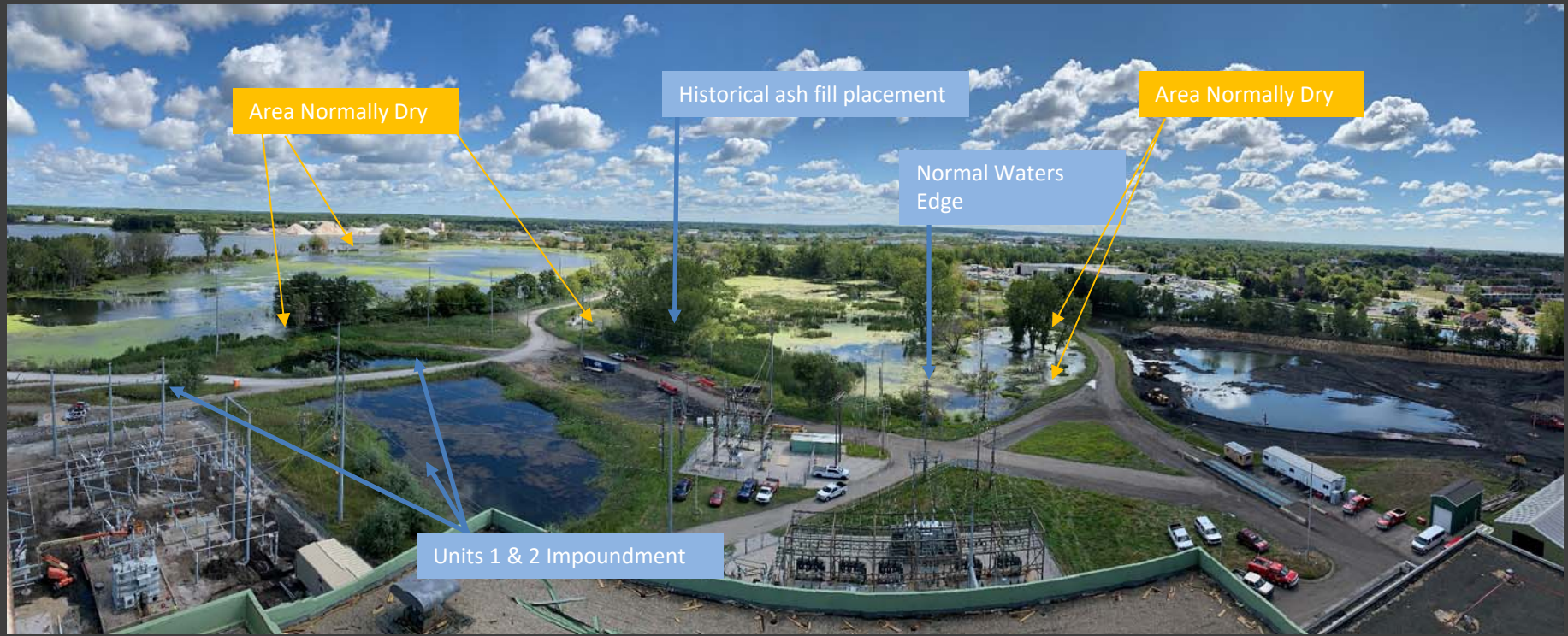


Harbor Island – Flooding (4/14/2020)

(presented to EPA on 4/27/2020)

NOAA/National Weather Service – January 13, 2020.

- January 2013 through November 2019, Lake Michigan rose 6 feet including nearly 2 feet from January-July 2019.
- Current Lake Michigan level is near record high which was observed in summer and autumn of 1986.
- Homes are falling in the lake along the west shoreline.
- Strong winds and rain cause spikes in water level.



Harbor Island – Recent Conditions (8/18/2020)

(presented to
EPA and EGLE on 8/24/2020)

Island Still Flooded with High Waters.

- Areas normally dry still have standing water.
- City boat launch on north end of island has been abandoned until water levels drop.
- Flooding and high water conditions do not allow removal of inactive Units 1/2 ash surface impoundment as originally proposed.



Size of each surface impoundment
Unit 1/2 – approximately 1.2 acres
Unit 3 a/b – approximately 0.5 acres

2. Update on Closure Activities & Corrective Actions Taken since April 2020.

Closure Activities Taken



1. Unit 3 Impoundment has stopped receiving coal combustion residuals.
2. Outfall has been closed and no longer in service.
3. Coal combustion residuals have been removed from East and West Unit 3 Impoundment.
4. Spillways and piping have been removed from center berm separating impoundments.
5. The Board will be working through Golder on appropriate quality control assurance that Unit 3 impoundment meets 'closed' requirements.

Plan in place is to remove CCR and leave the clean clay liner in place.

CQA lines of evidence were visual and analytical.

Additional analytical testing will be performed in November to demonstrate closure by removal of CCR in Unit 3.

Corrective Actions Taken

Increased Sampling to Include Surrounding Waters

- In April 2020, GHBLP and Golder met with EPA to summarize current site conditions and seek guidance on how best to move forward.
- In June 2020, GHBLP notified EPA that, based on Golder's recommendation, testing would be conducted on the surrounding waters of the site to help in the development of a plan for addressing Unit 1/2 impoundment given the inability to remove CCR material from the unit due to high water conditions.
- In August 2020, the preliminary results were shared both EPA and EGLE along with their relation to the development of a mixing zone.
- In September 2020, detailed test results were provided to both EPA and EGLE.
- In October 2020, the mixing zone request will be submitted to EGLE if the Board concurs with this recommended compliance strategy



Closure Requirements:

Sought EPA Clarification in April 2020

GHBLP asked for agency clarification of how to achieve maximum effective environmental protection for the inactive Units 1 & 2 impoundment given its physical circumstances.

- An answer was not received on this item in the July 13, 2020 letter from EPA.

The Board was prepared to close Units 1 & 2 Impoundment by removal in accordance with 40 CFR Part 257.

- Plans were submitted to the Department of Environment, Great Lakes and Energy.
- Wetland Permit Application was filed but was not granted.
- Work was bid out and awarded by Board of Directors.

Extraordinary high-water levels and flooding on the site is preventing work from being performed as originally planned.

Closure Requirements:

Sought EPA Clarification in April 2020

- The Board implemented additional corrective actions with increase water sampling to include surrounding water bodies to determine impacts and identify if an alternative compliance strategy may exist due to inability to conduct work as previously planned.
- Golder has evaluated test results and has prepared suggested alternative strategies to regulate and monitor this site.
- GHBLP has been in dialog with both EPA and EGLE to identify the applicable compliance methods in the absence of being able to perform work due to flood conditions and historical uses of the site.

3. Status of Unit 3 Closure

Status of the Unit 3 Closure

UNIT 3 EAST AND WEST BOTTOM ASH PONDS

- Based on the response from the U.S. Environmental Protection Agency (EPA) on July 13, 2020:
 - “EPA agrees that the Unit 3 impoundments meet the definition of “Existing CCR Surface Impoundment,” because they received CCR both before and after October 19, 2015.”
- Therefore the requirements in both the CCR Rule and Michigan Part 115 Statute apply
- The units have ceased receiving CCR and CCR containing wastes as of July 30, 2020 and are essentially cleared of CCR as of October 1, 2020
- A notification letter that JB Sims permanently ceased CCR placement and implemented closure activities was placed in the operating record and public website on August 24, 2020
- Site specific colorimetric testing baseline is complete and the revised Closure and CQA Plan was submitted to Michigan Department of Environment, Great Lakes and Energy (EGLE) on August 28, 2020
- CCR materials have been removed from the East and West impoundments
- Unit 3 East and West CCR Units were used primarily for wet generated CCRs (sluiced Bottom Ash, blow down waters, and wet flue gas desulphurization (FGD)) from the plant. This is important to remember for the Unit 1/2 Impoundment groundwater chemistry.
- Golder and GHBLP is working with EGLE to bring the Unit 3 surface impoundments to closure.

4. Evaluation of the Surface Impoundment for Unit 1/2

Additional Evaluation of Inactive Surface Impoundment for Units 1 and 2

DEFINITIONS

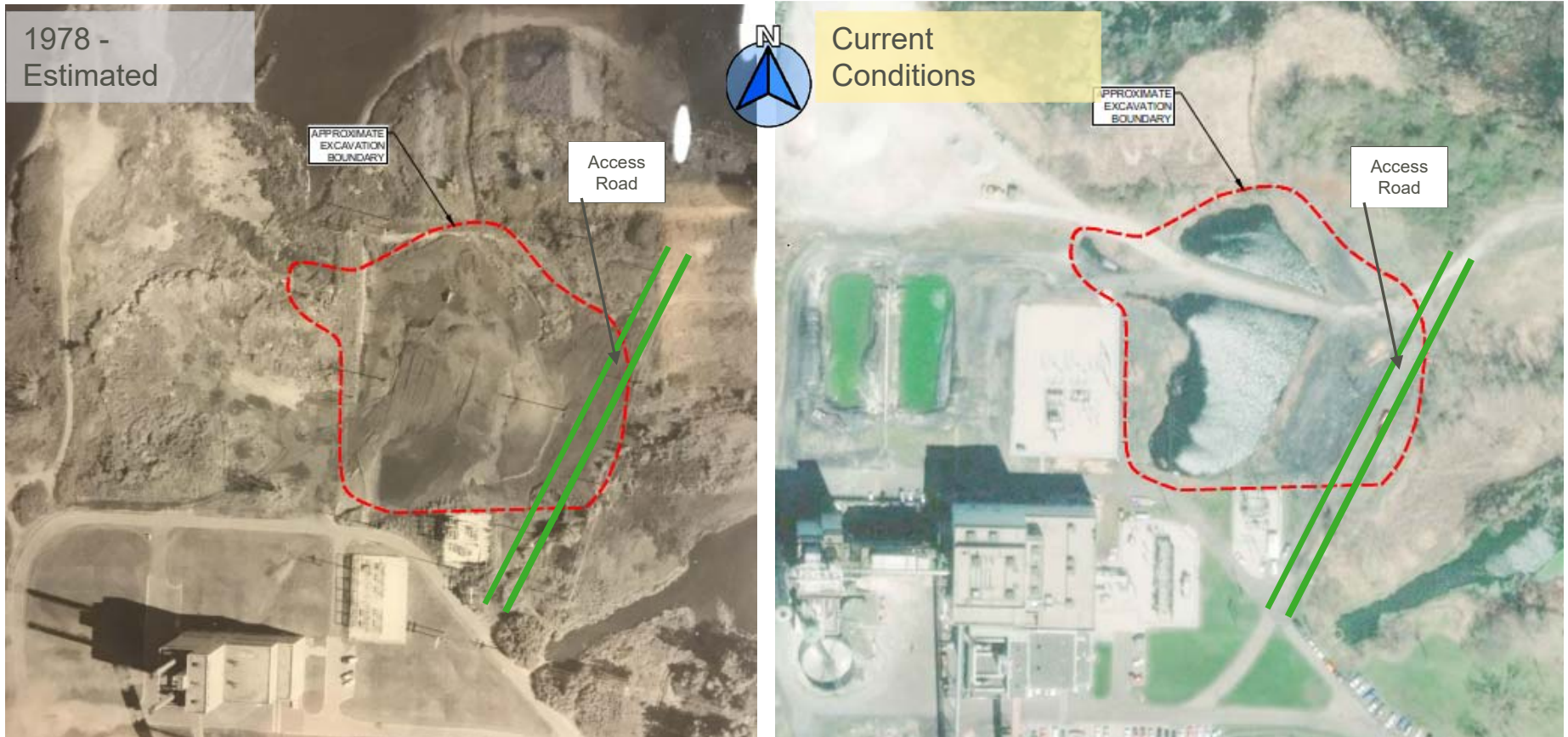
- EPA's response on July 13, 2020 stated:
“The Units 1 & 2 impoundment meets the definition of “Inactive CCR Surface Impoundment,” because it no longer received CCR on or after October 19, 2015 and still contained both CCR and liquids on or after October 19, 2015.”
- The term ‘Inactive CCR Surface Impoundment’ is not defined in the EGLE Part 115 Statute
- This leads to a need for compliance under the Groundwater Surface Water Interface (GSI) compliance under Michigan Part 201 and Part 31 – “Request for Calculation of Mixing Zone Based GSI Criteria”
- Three mixing zones were previously established for the JB Sims Power Plant in relation to process and non-process water discharges. Those discharges have ceased with the retirement of JB Sims Power Plant.

Additional Evaluation of the Inactive Surface Impoundment for the former Units 1 and 2

ADDITIONAL INFORMATION

- The inactive surface impoundment for Unit 1/2 when active and/or in use was one surface impoundment for the Power Plant Units 1 and 2. With the construction of roadways, culverts were installed that hydraulically connect the individual sections of the inactive impoundment.
- Golder has defined the boundary of the inactive surface impoundment based on aerial photographs and historical construction information, excluding areas where ash was beneficially used for island fill over 40 years ago.
- Based on guidance from EGLE during a meeting on October 18, 2019, Act 641 dated January 11, 1979 was used to prepare the delineation of the Inactive Surface Impoundment for the former Units 1 and 2 was submitted to EGLE on October 14, 2019, with a revision based on EGLE comments submitted on November 19, 2019.
- Preliminary review of the groundwater analytical data indicates that the elevated concentrations of some constituents of concern (COCs) are not the result of the active or inactive surface impoundments. They are likely from alternate sources.

Golder Delineation for Impoundment Closure– October/November 2019



Golder delineated inactive Unit 1 & 2 Impoundment using soil borings and historical photographs to define impoundment boundaries and, to be extra conservative, drew the boundary beyond the defined impoundment over access road.

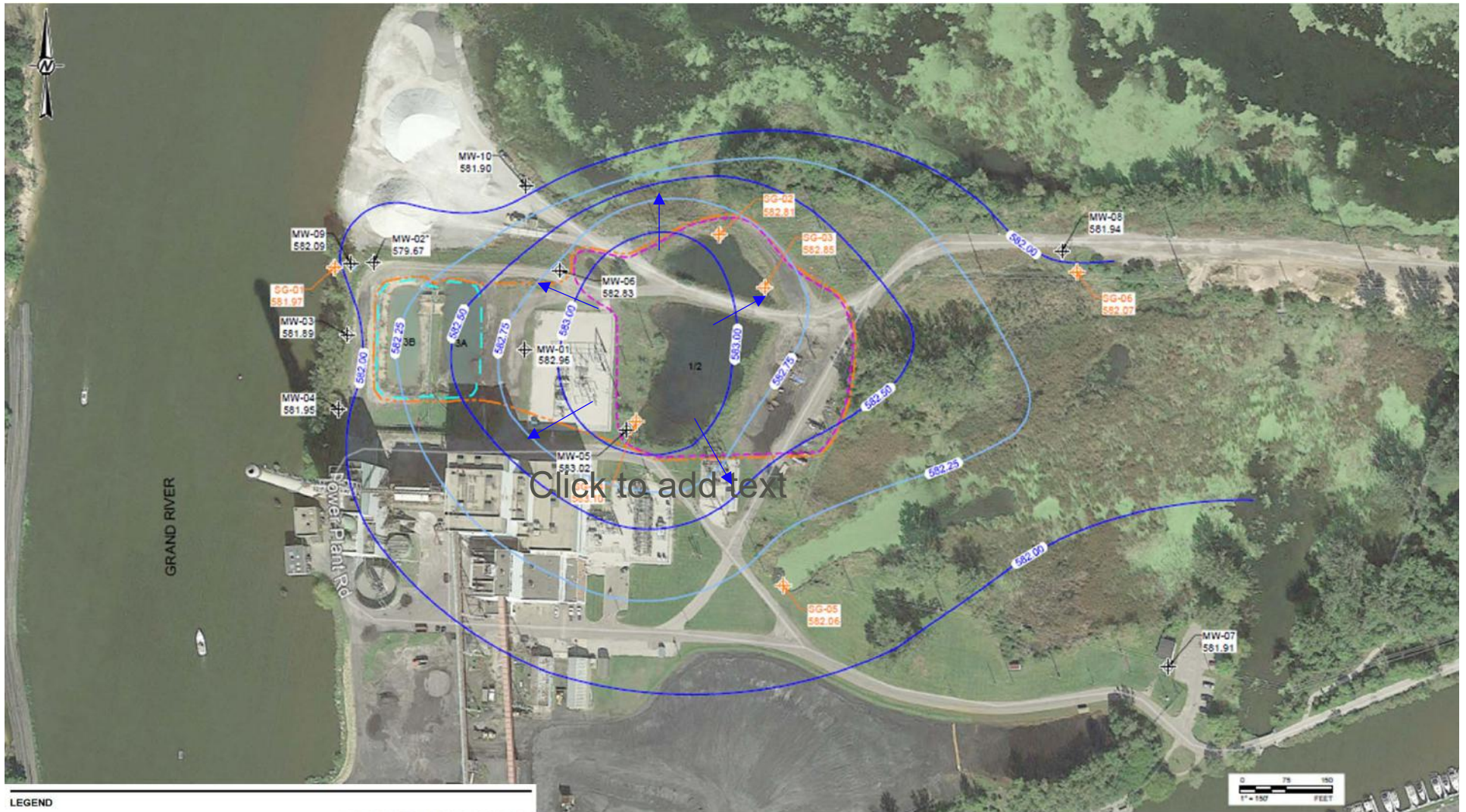
Note: Picture to the left was estimated to have been taken in 1978 prior to North substation construction in preparation for Unit 3.

Overview

HOW GOLDER HAS ASSESSED THE SITE TO DATE






- Harbor Island has a complex history of past uses.
- The Island was home to a portion of the City Dump site for many decades.
- Prior to the power plant, coal was stored on the island for residential home heating
- Much of the land on Harbor Island was built up by ash fill material generated from transmission Units 1/2; material has been largely undisturbed for over 40 years.
- It is not feasible to return this former delta back to its original conditions.
- Groundwater underlying the surface impoundments are hydraulically connected to the Grand River
- While some material removal is anticipated it is reasonable to conclude that there will be considerable amounts of ash and other waste that will remain.
- Disturbance of materials could lead to other environmental concerns.
- Ongoing water quality analysis will continue to be required.

SITE WIDE MAP



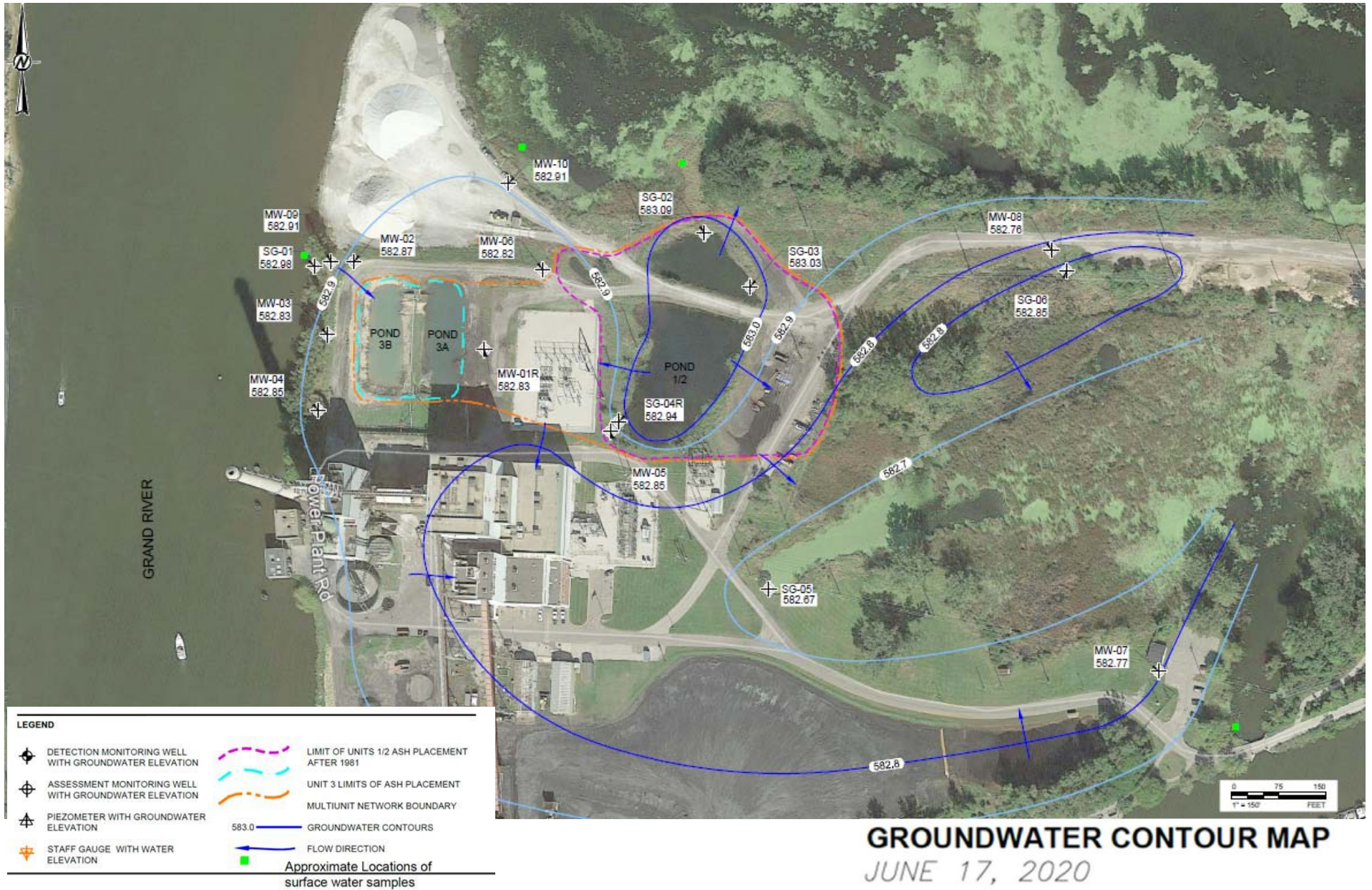
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LEGEND

-  DETECTION MONITORING WELL
-  ASSESSMENT MONITORING WELL
-  PIEZOMETER
-  STAFF GAUGE
-  LIMIT OF UNITS 1/2 ASH PLACEMENT AFTER 1981
-  UNIT 3 LIMITS OF ASH PLACEMENT
-  MULTIUNIT NETWORK BOUNDARY

GROUNDWATER CONTOUR MAP
 NOVEMBER 15, 2019

SITE WIDE MAP



Geochemical Fingerprint

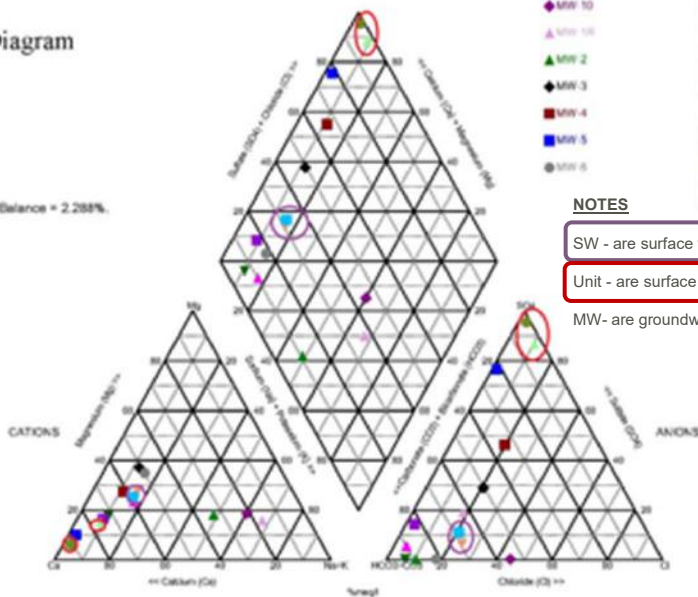
ANALYTICAL COMPARISONS

- Golder evaluated multiple forms for reviewing the geochemical (fingerprinting) comparisons such as stiff diagrams and piper diagrams
- The surface water and CCR impoundment water is not statistically similar, based on the lack of similarities of the shape of the diagrams for the surface water as compared to the CCR Units

Sanitas™ v.9.6.26 For the statistical analyses of ground water by Golder Associates only. EPA

Piper Diagram
6/17/2020

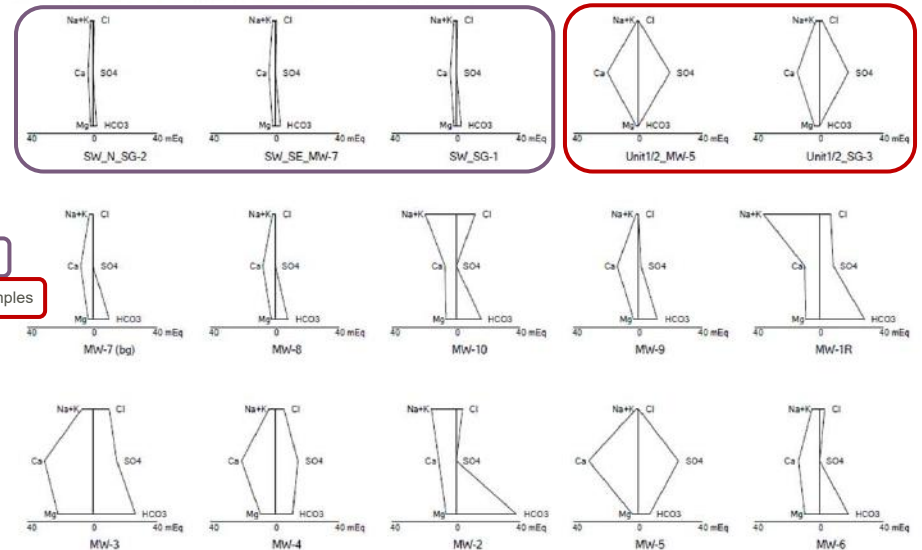
Cation-Anion Balance = 2.288%



NOTES

- SW - are surface water samples
- Unit - are surface impoundment samples
- MW - are groundwater samples

Sanitas™ v.9.6.26 For the statistical analyses of ground water by Golder Associates only. EPA



Stiff Diagram - 6/17/2020 Analysis Run 7/17/2020 11:26 AM
Grand Haven BLP Client: Golder Associates Data: DT-Grand Haven BLP

Grand Haven BLP Client: Golder Associates Data: DT-Grand Haven BLP


Mixing Zone Determination

EGLE/DEQ EQP4483

Michigan Law (Part 201 of Act 451; 1994) allows for an evaluation of a mixing zone when impacted groundwater from a site already discharging to a surface water (Grand River for the JB Sims site). This is the condition at JB Sims Units 1/2 and 3.

The procedure allows a site to provide information to request the calculation of mixing zone-based criteria for the groundwater surface water interface (GSI pathway)

The policy and procedure from the Remediation and Redevelopment Division (RRD) have developed a form identified as EQP4483, Request for Mixing Zone-Based GSI Criteria

	Remediation and Redevelopment Division POLICY AND PROCEDURE		DEPARTMENT OF ENVIRONMENTAL QUALITY
	Original Effective Date: September 30, 2004 Revised Date: May 25, 2018 Reformatted Date: May 25, 2018	Subject: Request for Calculation of Mixing Zone- Based Groundwater-Surface Water Interface Criteria Program Name: Part 201 and Part 213	
	Number: RRD-33	Page: 1 of 8	Type: <input type="checkbox"/> Policy <input checked="" type="checkbox"/> Procedure <input type="checkbox"/> Policy and Procedure

A Michigan Department of Environmental Quality (MDEQ) Policy and Procedure cannot establish regulatory requirements for parties outside of the MDEQ. This document provides direction to MDEQ staff regarding the implementation of rules and laws administered by the MDEQ. It is merely explanatory, does not affect the rights of or procedures and practices available to the public, and does not have the force and effect of law. MDEQ staff shall follow the directions contained in this document.

PURPOSE:

This procedure provides information on how to request the calculation of mixing zone-based criteria for the groundwater-surface water interface (GSI) pathway pursuant to Part 201, Environmental Remediation, and Part 213, Leaking Underground Storage Tanks, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA).

Several MDEQ divisions implement response activity and corrective action relying upon the cleanup criteria and process of Part 201. If there are questions of the documents' applicability to facilities subject to other environmental statutes, a person should consult with the appropriate MDEQ division staff.

Information regarding the application of Michigan surface water quality standards and options for compliance with the GSI pathway is available in MDEQ Groundwater-Surface Water Interface Pathway Compliance Options Reference Materials.

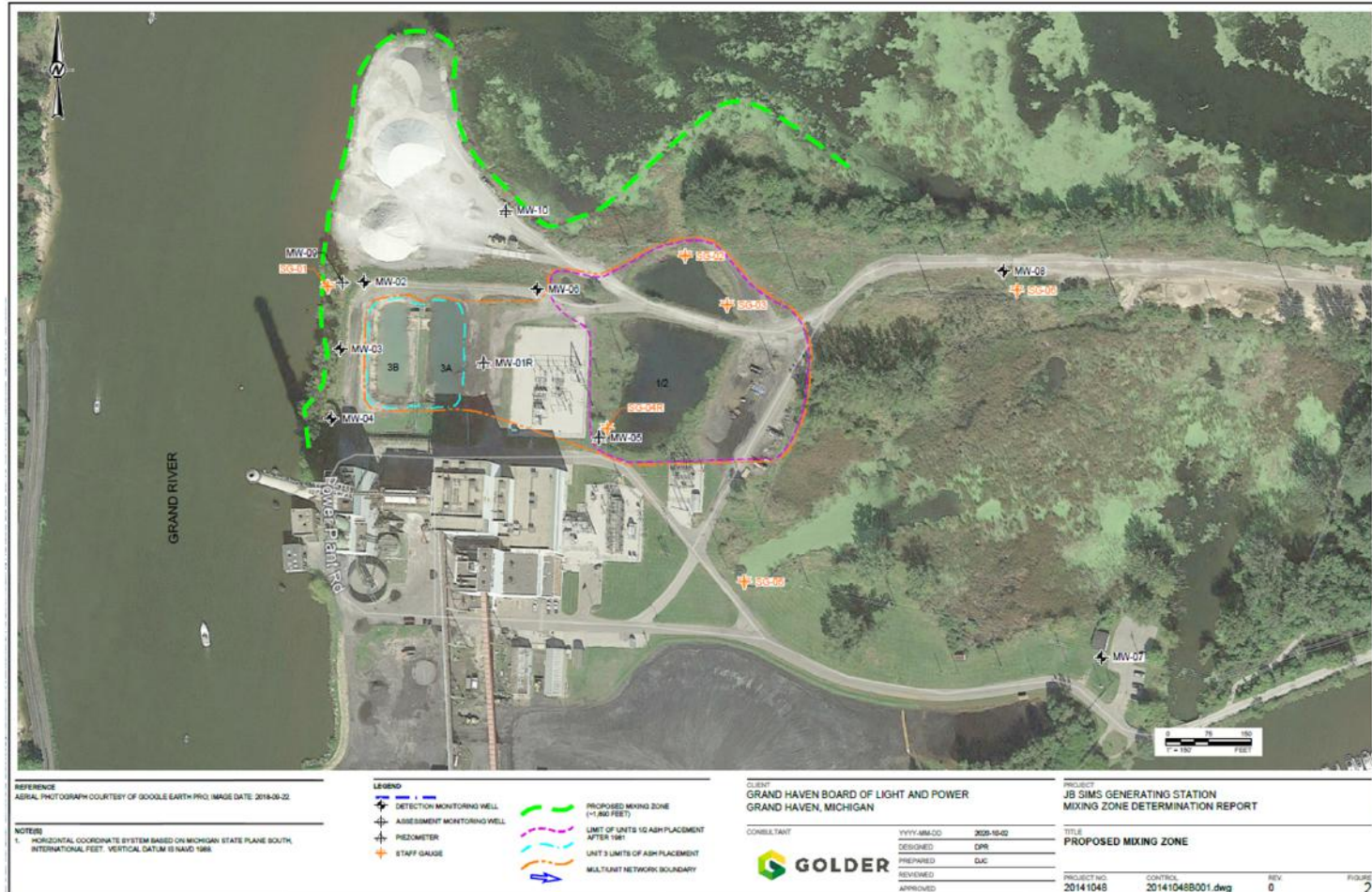
DEFINITIONS:

GSI:	Groundwater-Surface Water Interface that is the location at which groundwater enters a surface water body.
GSI criteria:	The water quality standards for surface waters developed by the MDEQ pursuant to Part 31.
Mixing zone:	A mixing zone is the portion of a surface water body in which venting groundwater is mixed with the receiving water.
Part 31	Part 31, Water Resources Protection, of the NREPA

Mixing Zone Determination

PROPOSED MIXING ZONE

Based on guidance from EGLE during a meeting on October 18, 2019 and on the available data collected at the site, a mixing zone determination has been prepared.



Mixing Zone Determination

SUMMARY OF SITE DATA

- Constituents of concern (CCR constituents) at groundwater surface water interface monitoring wells (MW-3, MW-4, MW-9, and MW-10) or in background well (MW-7) have not been measured to date in groundwater at concentrations greater than Part 31 final acute values (FAVs), with the exception of chloride and sulfate.
- Chloride at MW-3, only once in October 2018 and not confirmed during the following event.
- Sulfate at MW-3, only twice in March and May 2017 (with two analyses between that did not exceed the FAV) and not confirmed the following event.
- Golder conducted a conservative evaluation of the mixing zone with the Grand River during drought conditions. During drought conditions in the Grand River, there is less water to mix with the groundwater. Yet, based on the size of the Grand River, even during drought conditions, the flow in the Grand River past the Sims plant is >5,000 X the rate of groundwater flow into the river past the 1,900-ft-long GSI line (1,030 vs. 0.19 cubic feet/second). This results in a lot of rapid mixing.
- Therefore, a mixing zone is protective of the environment since groundwater does not exceed FAVs

5. Recommendations for Steps Forward

Recommendations for Steps Forward

CLOSURE STRATEGY

- Closure by removal of ash for Unit 3 Impoundment with lines of evidence documented (visual and analytical)
- Request a GSI mixing zone determination (MZD) and analysis request to EGLE, as we believe the MZD is the preferred and an applicable part of the protective remedial strategy. (if Board concurs with this remedial strategy)
- Removing ash from Unit 1/2 may be impracticable due to high water levels, possible increase in groundwater disturbance and surrounding wetlands
- Closure by capping and leaving ash in place for the inactive surface impoundment for former Unit 1/2 or removal using dredging
- Develop a post-closure monitoring plan
 - Prepare as a response activity plan under Part 201
 - A post-closure monitoring plan would include monitoring of the closure (cap or removal) and groundwater focusing on the GSI criteria and applicable mixing zone-based GSI criteria

6. Summary

Main Summary Points for Board

JB SIMS COMPLIANCE

- Golder has documented the closure process for Unit 3 and is working with EGLE on the final closure mechanism
- We are pursuing closure options and remedial strategies (Act 641 and the mixing zone determination) as suggested by EGLE (on 10-18-2019) for surface impoundment Unit 1/2
- Golder is pursuing a mixing zone determination from EGLE based on the site data that meets the requirements of mixing zone-based GSI criteria
- Golder will continue our dialog with both State and Federal agencies to ensure that our approach meets acceptable closure requirements and achieve compliance with applicable criteria at the site
- The public and the Board can be confident that Golder has gathered the necessary data, properly assessed the site and the recommended strategy provides proper protection for human health and the environment



GOLDER

Thank you.