



Prepared by

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Semi-Annual 2025 Remedy Selection Progress Report

For Compliance with Coal Combustion
Residuals (CCR) Rule

Former J.B. Sims Generating Station

July 30, 2025

Contents

1.0 Introduction 2

2.0 Background 4

 2.1 Units 1/2 Impoundment..... 4

 2.2 Unit 3A/B Impoundments 5

3.0 Evaluation of Potential Remedies..... 5

 3.1 Groundwater-Surface Water Interaction Transducer Study..... 5

 3.2 Remedial Investigation Data Collection Work Plan 6

 3.3 Residual Coal Removal 7

4.0 Next Steps 8

5.0 References..... 8

FIGURES

Figure 1 | Site Vicinity Map..... 3

1.0 Introduction

The former J.B. Sims Generating Station was a coal-fired, steam-generating power facility with a net capacity of approximately 70.5 megawatts that was operated by the Grand Haven Board of Light and Power (GHBLP). The facility is located at 1231 North 3rd Street, on Harbor Island, in Grand Haven, Michigan (**Figure 1**) (the Site). The coal combustion residuals (CCR) generated at the former Site were stored in two CCR units: (1) the inactive Units 1/2 Impoundment and (2) the former Unit 3A/B Impoundments. Operations at the Site ceased in February 2020 and the plant subsequently was decommissioned. During deconstruction, wastewater from boiler and infrastructure cleanout was sent to Unit 3A/B. The waste disposal into Unit 3A/B ceased in July 2020.

The U.S. Environmental Protection Agency's (EPA) final CCR Rule 40 CFR §257 establishes a comprehensive set of requirements for the management and disposal of CCR (or coal ash). Pursuant to these requirements, groundwater monitoring is performed for the Site. The initial groundwater monitoring network for the CCR units was established in 2017. Background data collection occurred between November 2022 and August 2023 for the current monitoring network and background wells. The first sample event after the background monitoring period using the updated monitoring network occurred in October 2023. The October 2023 sampling event was considered both a detection and assessment monitoring event based on the prior status of the Site in assessment monitoring before the well network was updated. Both statistically significant increases (SSI) of constituents in groundwater above the background values and statistically significant levels (SSLs) of constituents over groundwater protection standards (GPS) were identified from the October 2023 sample event. Therefore, the status of the groundwater monitoring program for both CCR units is assessment monitoring and evaluation of potential remedies. The Site initiated assessment of corrective measures, pursuant to 40 CFR 257.95(g), on May 1, 2024, following the identification of SSIs at one or more monitoring wells.

The Assessment of Corrective Measures (ACM) was published August 5, 2024, and additional data collection is planned through 2025 to further support the remedy selection process. The purpose of this report is to provide an update describing progress in the first half of 2025 toward selecting a remedy for corrective action at the Grand Haven Harbor Island (GHHI) Site, as required by 40 CFR 257.97(a) of the CCR Rule.



Figure 1 | Site Vicinity Map

2.0 Background

The former Unit 3A/B Impoundments were engineered, clay-lined, above-ground units and ceased receiving CCR material in July 2020. In 2017, a Groundwater Monitoring System Certification was first developed for the 3A/B Impoundments, which consisted of one background well (MW-07), four (4) downgradient detection monitoring wells (MW-01R, MW-02, MW-03, and MW-04), and an additional assessment monitoring well (MW-09) (ERM, 2017). Groundwater monitoring conducted in 2017 by GHBLP identified statistically significant increases (SSIs) of constituents in groundwater, and therefore the GHBLP implemented assessment monitoring (Golder, 2018). Assessment monitoring identified SSLs over the GPS at the Site, and therefore GHBLP stated that it was initiating assessment of corrective measures for the Site; however, that document (Golder, 2018a) was completed prior to the inclusion of Units 1/2 Impoundment CCR unit and therefore only represents the status of Unit 3A/B Impoundments.

The inactive CCR Units 1/2 Impoundment was a depression in the ground where sluiced ash was disposed. The inactive Units 1/2 Impoundment ceased receiving CCR material in 2012. After adding monitoring wells to the network to address the Units 1/2 Impoundment, the Updated Notice of Groundwater Protection Standard Exceedance was issued to document SSLs over GPS for both Units 1/2 Impoundment and Unit 3A/B Impoundments on July 22, 2021.

In 2021, to better understand the groundwater flow on the Island and to verify that the monitoring network in place at the time was adequate, 22 piezometers, six (6) staff gauges, and 3 stilling wells were installed. These additional monitoring locations resulted in a better understanding of groundwater flow. The Field Summary Report of Results from Approved Work Plan - Piezometer Installation and Additional Data Collection suggested that MW-07 may be an inappropriate location for a background well due to the potential for groundwater to flow from Units 1/2 Impoundment toward MW-07 (Golder, 2022). Therefore, in 2022 a new groundwater monitoring network was selected for the CCR units, including new background wells.

Background data collection for the updated monitoring network and new background wells occurred between November 2022 and August 2023. The first sample event after the updated background monitoring period occurred in October 2023, and quarterly monitoring was conducted in 2024 and the first two quarters of 2025.

2.1 Units 1/2 Impoundment

The inactive CCR Units 1/2 Impoundment was a depression in the ground where sluiced ash was disposed. The inactive Units 1/2 Impoundment ceased receiving CCR materials in 2012. Due to the abstract size and lack of defined boundaries, Units 1/2 Impoundment was delineated by Golder in the 2019 report *CCR Impoundment Ash Delineation at the J.B. Sims Generating Station* (Golder, 2019). Following the submission of the delineation report, a boundary of the inactive Units 1/2 Impoundment was agreed upon by GHBLP, EPA, and the Michigan Department of Environment, Great Lakes, and Energy (EGLE), which includes an area of sluiced ash disposal to the east of MW-30 into the internal wetland. The parties also agreed that the North Channel adjacent to the Units 1/2 Impoundment would be evaluated for potential

inclusion in the revised boundary the Units 1/2 Impoundment. After field investigation of the North Channel area to delineate ash and submittal of the investigation data and proposed additional data collection, EGLE and EPA determined that the ash associated with the North Channel is not associated with Units 1/2 Impoundment. EGLE and EPA indicated that the North Channel ash will be evaluated as a potential CCR Management Unit under the EPA CCR Legacy Rule (40 CFR §257.95).

2.2 Unit 3A/B Impoundments

The former CCR Unit 3A/B Impoundments were constructed as two above-ground surface impoundments underlain by a clay liner; however, the engineered clay liner did not meet Part 115 CCR surface impoundment liner criteria. Golder (2020) stated that the former 3A/B Impoundments were built over a “field of ash” that was generated from Boiler Units 1 & 2; however, existing soil borings do not support that a “field of ash” is present under the impoundments. Although the former coal-fired power generation facility ceased operations in February 2020, the Site continued to use the Unit 3A/B Impoundments to store cleanout materials from the hoppers, vessels, etc. prior to demolition of the buildings. The impoundments ceased receiving waste on July 30, 2020. Removal of CCR from the impoundments was completed on November 6, 2020 and the liner remains in place. Following the CCR removal, Golder conducted ash removal verification that was ultimately denied by EGLE. Further ash delineation will be conducted to define the extent of any remaining CCR adjacent to the Unit 3A/B Impoundments.

3.0 Evaluation of Potential Remedies

Ongoing site work during the January to June 2025 period includes the following:

- Waste coal was removed from the southwestern portion of the Island.
- The first and second quarterly groundwater monitoring events were completed in February and April.
- A technical memorandum was prepared summarizing the status and interim findings of the datalogging pressure transducer array deployed at the Site;
- The Remedial Investigation Data Collection Work Plan was prepared and submitted to the State for regulatory approval.

The following sections provide additional information related to these tasks.

3.1 Groundwater-Surface Water Interaction Transducer Study

Seventeen datalogging pressure transducers were deployed in December 2023 in eight monitoring wells, two piezometers, and six surface water gauging locations to improve understanding of groundwater flow and groundwater-surface water interactions. The transducers measure and record water levels and water temperature on an hourly basis, providing a substantially greater data density than the individual levels measured approximately every three months. When plotted as time-series graphs (hydrographs), dynamic groundwater-

surface water interactions can be observed that warrant continued monitoring in support of remedial design plans. The interaction between groundwater and surface water is critical to understanding the nature and extent of contamination at the Site.

A technical memorandum was prepared to communicate the value of the data being collected by the transducers, and to make recommendations for optimizing and improving the transducer network. Specific recommendations include:

- Relocating two transducers to monitor locations of higher priority
- The purchase and deployment of additional transducers
- Repairing/winterizing three monitoring locations

The memorandum also recommends that the transducer monitoring program be extended through 2026.

3.2 Remedial Investigation Data Collection Work Plan

The Remedial Investigation Data Collection Work Plan was submitted for regulatory review in the first half of 2025. The Work Plan is designed to provide additional Site characterization data to assess the feasibility of remedial alternatives and to generate associated cost estimates. The Work Plan was reviewed and approved by EGLE on July 9, 2025. Currently, the following four remedial alternatives are being considered:

- Alternative 1 – Source Control - Removal and In-situ Solidification and Stabilization in combination with additional measures
- Alternative 2 – Hydraulic Containment Wall
- Alternative 3 – Hydraulic Containment Extraction and Treatment
- Alternative 4 – Capping in combination with additional measures

In support of these alternatives, phased data collection was proposed in the Work Plan. The first phase includes the following:

- Additional Sampling Locations: Two existing nature and extent monitoring wells will be added to the monitoring program beginning in the third quarter 2025 (piezometer PZ-13 and monitoring well MW-39).
- Exploratory Borings: The base of the surficial aquifer, as defined by the top of a thick and laterally continuous clay unit, has been established at seven locations ranging in depth from 21 to 48 feet below grade. Four additional exploratory borings are planned to a target depth of up to 70 feet deep to map the base of the surficial aquifer and confirm the clay unit is a lower confining unit.
- Deep Monitoring Well Installation: Three of the four “exploratory borings” will be converted to monitoring wells and screened near the contact between the upper

unconfined aquifer and the lower clay confining unit. The wells will be used to describe vertical hydraulic gradients, and evaluate any contaminant concentrations in lower groundwater.

- **Shallow Monitoring Well Installation:** Three shallow monitoring wells will be installed near Units 1/2 to delineate the nature and extent of the GPS exceedances. The three new monitoring wells will be added to the monitoring program.
- **Residual coal ash:** A residual coal ash investigation will be completed to delineate the extent of any remaining coal ash from the clean-out process adjacent to the Unit 3A/B Impoundment. The investigation area is approximately 0.84 acres. The investigation of this area will include a systematic evaluation of an 89-cell grid, each cell having dimensions of 27 feet by 27 feet.
- **Ash characterization:** An ash characterization investigation will be completed to assess the chemical and physical properties of ash in Units 1/2. Variations in ash properties will be addressed using nine samples obtained from within the unit boundary. Nine is the minimum number of samples required by EGLE for statistical analysis of chemical properties. Nine samples of ash, and nine samples of ash pore water will be collected for analysis from depths ranging from 2 to 14 feet below grade. Physical and chemical analysis of the ash will be completed to evaluate the potential for in-situ stabilization, and additional analytical characterization will be completed to inform groundwater contaminant modeling.

Subsequent phases of data collection include:

- Installation of a test well and aquifer testing to evaluate the groundwater extraction and treatment remediation alternative and to inform the groundwater model.
- Development of a 3-dimensional numerical flow and transport groundwater model to support evaluation of remedial alternatives.
- Topographic and bathymetric surveys of the Island to support cost estimating for remedial alternatives.
- A wetland functional assessment to support wetland permitting, if needed, when implementing remedial alternatives.

An implementation schedule for the Work Plan is being developed.

3.3 Residual Coal Removal

While not regulated by the CCR Rule, approximately 8,300 cubic yards of residual coal and underlying soils were removed from the former coal storage area on the southwestern portion of

Harbor Island between April and June 2025 (**Figure 1**). The coal and soils were disposed in Autumn Hills landfill (Zeeland Township, MI), and replaced with approximately 3,800 cubic yards of clean topsoil. The topsoil has been compacted, graded, and seeded to minimize erosion and runoff.

In the panoramic view of the regraded former coal pile area below, the vantage point is south of the former coal pile, looking west, north, and east.



The coal pile removal was an integral step to facilitate access to the subsurface for future remedial actions.

4.0 Next Steps

Data collected pursuant to the Remedial Investigation Work Plan (Section 3.2) will be used to evaluate the feasibility of the identified remedial alternatives. Furthermore, the data will help refine cost estimates for each of the remedial alternatives, and ultimately inform remedy selection.

5.0 References

- ERM, 2017. Groundwater Monitoring System Certification for the Grand Haven Board of Light and Power, Environmental Resources Management Michigan, Inc. November 2017.
- Golder Associates, Inc., 2018. 2017 Annual Groundwater Monitoring and Corrective Action Report. January 30, 2018.
- Golder Associates, Inc., 2018a. Notice of Groundwater Protection Standard Exceedance. October 15, 2018.
- Golder Associates, Inc., 2019. CCR Impoundment Ash Delineation at the J.B. Sims Generating Station. October 14, 2019.
- Golder Associates, Inc., 2020. 2019 Annual Groundwater Monitoring & Corrective Action Report. January 31, 2020.
- Golder Associates, Inc., 2022. Field Summary Report of Results from Approved Work Plan -Piezometer Installation and Additional Data Collection. February 15, 2022.
- HDR, 2024. Hydrogeologic Monitoring Plan. November 1, 2024.

HDR, 2024a., Former J.B. Sims Generating Station Determination of Statistically Significant Increases over Background per §257.93(h)(2) and R 299.4440(8) of the Michigan Part 115 Rules. January 24, 2024.

HDR, 2025. Former J.B. Sims Generating Station Remedial Investigation Data Collection Work Plan. July 8, 2025.