Renew Harbor Island

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Semi-Annual 2026 Remedy Selection Progress Report

For Compliance with Coal Combustion Residuals (CCR) Rule

Former J.B. Sims Generating Station

July 30, 2026

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Contents

FIGURES

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 and was later updated. 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 2026 to further support the remedy selection process. The purpose of this report is to provide an update describing progress in the first half of 2026 toward selecting a remedy for corrective action at the 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 that ceased receiving CCR material in July 2020. In 2017, a Groundwater Monitoring System Certification was first developed for the Unit 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 thus 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. 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 the 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, 2025, and the first two quarters of 2026.

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 of 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 ash associated with the North Channel is not associated with the 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 Unit 3A/B Impoundments were built over a “field of ash” that was generated from Boiler Units 1 & 2. 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

In support of evaluating and selecting a remedial action, additional field data collection was completed during the January to June 2026 period, with field data used to support development of a numeric groundwater model for the Island. Additionally, work began on assembling remediation alternatives and conceptual designs for use in remedy selection. The following sections provide additional information related to these tasks.

3.1 Field Data Collection

Site field work during the January to June 2026 period included the following:

- A topographic and bathymetric survey of Harbor Island, the Northern Wetland, and the Main and South Channels of the Grand River was completed in March 2026, with results contained in a summary report in May 2026.
- A 6-inch diameter test well was constructed in March 2026, and a constant-rate aquifer test was completed in March 2026 to more thoroughly characterize Site hydrogeology.
- Geotechnical samples were collected during the installation of well PW-1 from the silt unit that underlies the shallow sand aquifer. The silt samples were analyzed for grain size (including hydrometer) and hydraulic conductivity through permeameter testing.

3.1.1 Bathymetric and Topographic Surveys

To gather surface data to support groundwater modeling and remedy design, topographic and bathymetric surveys were completed on Harbor Island and nearshore environments. In March 2026, HDR contracted Mannik & Smith Group (MSG) to conduct a LiDAR (Light Detection and Ranging) survey using Unmanned Aircraft Systems (UAS, i.e. drone technology) over the Island, the Internal Wetland, and the Northern Wetland. The bathymetric survey was also completed in March 2026 on the Main Channel and South Channel of the Grand River. Bathymetric data was also obtained through a "poling" survey by wading through the Units 1/2 Impoundment waste ponds. The elevation data obtained through the topographic and bathymetric surveys are being applied to remedial scenarios to support design plans and construction cost estimates.

3.1.2 Aquifer Testing

To evaluate remedial alternatives that may include groundwater extraction and treatment, a constant-rate aquifer test was completed in March 2026. A new 6-inch diameter pumping well (PW-1) was installed in March 2026, northeast of the Unit 3A/B Impoundments. The well was screened from 28 to 38 feet below grade, in a fine-to-medium sand unit located above a laterally-extensive silt unit.

Following well development and a step drawdown test, well PW-1 was pumped at a constant rate of 112 gallons per minute (GPM) for 34 hours, during which time water levels were monitored in the pumping well, nearby monitoring wells, and surface water features. Water level drawdown occurred in several nearby wells, with the most representative results observed at well MW-01RB, screened in the same sand unit as PW-1. Based on drawdown at MW-01RB, the transmissivity of the sand was estimated to be 2,800 ft^2/d; and applying a thickness of the sand unit of 13.5 feet, the hydraulic conductivity was estimated to be 205 ft/d.

No drawdown was measured in several monitoring wells, including wells MW-06 and MW-11, located less than 100 feet from well PW-1. Additional nearby wells, such as MW-01R, declined slowly during testing. The poor hydraulic connection between these wells and the pumping well was due to fine-grained materials above the sand aquifer, but below the saturated zone in which the wells were screened. The average estimated vertical hydraulic conductivity of the fine-grained materials was 0.32 ft/d, or approximately 3 orders of magnitude lower than the horizontal hydraulic conductivity of the sand aquifer.

Multiple analytical samples were collected during the pumping phase and submitted for analysis of CCR constituents and other water quality parameters. CCR constituents were generally lower at well PW-1 than at most monitoring wells. Only sulfate and TDS were reported to exceed GPS in groundwater from PW-1, and each of them was reported above GPS in only one of three samples collected from PW-1. Concentrations of iron, calcium, and magnesium were analyzed to support future water treatment designs.

3.1.3 Geotechnical Samples

During the installation of well PW-1, four geotechnical samples were collected between 41 and 47 feet below grade, from within the silt unit underlying the sand aquifer. All four samples were analyzed for grain size, and two of the four were analyzed for hydraulic conductivity via

permeameter testing. The grain size analyses confirmed that silt was the majority fraction in each of the four samples. The permeameter testing determined that the average hydraulic conductivity was 3.8 x 10^{-7} in the silt sample collected from 43 to 44 ft bgs; and 1.9 x 10^{-6} in the silt sample collected from 44 to 45 feet bgs.

3.2 Groundwater Flow Model

During the second quarter of 2026, development of a three-dimensional (3D) groundwater flow model was performed to simulate potential CCR remedies. This model uses existing stratigraphic and hydrologic data that has been collected and compiled to date to create a conceptual site model (CSM) that will serve as the framework for the flow model. The model was calibrated to Site water levels, including a transient calibration to changing water levels measured during aquifer testing.

The model has been used to simulate potential remedies by illustrating various remedial scenarios involving groundwater extraction and treatment. These scenarios have in turn been used to inform the ongoing remediation alternatives (Section 3.4).

3.3 Groundwater Monitoring

The first and second quarterly groundwater monitoring events were completed in February and April 2026. Because the monitoring program was expanded by six wells (MW-16, MW-28, MW-32, MW-36, MW-37, and MW-38) in April 2024, the eighth sampling event for these wells occurring in February 2026, and a statistical analysis was calculated for the first time following receipt of the first quarter 2026 analytical results. The groundwater monitoring program continues to demonstrate that the subset of wells with CCR constituents exceeding Groundwater Protection Standards (GPS) remains consistent, the 95LCLs for individual constituents remain consistent and the groundwater plumes have been delineated.

3.4 Remedial Alternatives Update

In the second quarter of 2026, specific remedial alternative conceptual designs were developed for Harbor Island groundwater. Remediation alternatives include:

1. Source Control
2. Barrier Wall
3. Source Control + Barrier Wall Hybrid

Prior to remedy selection, a public meeting will be held to present the remediation alternatives to the public and seek feedback. After remedy selection, a Remedial Action Plan will be prepared for submittal to EGLE. It is anticipated this will be submitted to EGLE in the first quarter 2027.

4.0 Next Steps

Tasks underway for the July to December 2026 period include the following:

- A Wetland Functional Assessment and Wetland Type Determination will be completed in the third quarter of 2026 to evaluate the quality and ecological functions of the onsite wetlands, ensuring that mitigation measures comply with legal requirements for in-kind replacement.
- The design, bid specifications, and procurement for CCR removal from the North Channel is ongoing. A Joint Permit Application (JPA) facilitating the CCR removal action has been filed with EGLE and is awaiting review.
- The third quarter 2026 groundwater monitoring and sampling event is scheduled to be performed in August 2026.

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., 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.