

July 30, 2025

TRANSMITTAL VIA EMAIL 07/30/2025

Ms. Lori Babcock
Michigan Department of Environment, Great Lakes, and Energy
Materials Management Division
Bay City District Office
401 Ketchum St, Suite B
Bay City, Michigan 48708

SUBJECT: Semiannual Progress Report – Selection of Final Remedy pursuant to §257.97(a)
DE Karn Bottom Ash Pond Coal Combustion Residuals (CCR) Unit

Dear Ms. Babcock:

This Semiannual Progress Report, prepared as a requirement of §257.97(a) of the Federal Coal Combustion Residual (CCR) Rule, describes progress towards selecting and implementing the final remedy for the Karn Bottom Ash Pond after the completion of the *Assessment of Corrective Measures, DE Karn Bottom Ash Pond Coal Combustion Residual Unit¹*, dated September 11, 2019 (Karn Bottom Ash Pond ACM). Groundwater management alternatives considered to be technically feasible that could potentially address the residual arsenic under known groundwater conditions following source removal activities were identified in the report as: 1) Source removal with post-remedy monitoring, 2) Source removal with groundwater capture/control, 3) Source removal with impermeable barrier, 4) Source removal with active geochemical sequestration, and 5) Source removal with passive geochemical sequestration.

Karn Bottom Ash Pond Closure Activities

Consumers Energy prepared and submitted to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) a closure work plan for the Karn Bottom Ash Pond (Karn Bottom Ash Pond Work Plan) and a Response Action Plan developed in accordance with Part 115 dated April 9, 2018 and March 15, 2019, respectively. These plans were developed in anticipation of supporting the Assessment of Corrective Measures that would be necessary for evaluating and selecting a final remedy for the Karn Bottom Ash Pond after Consumers Energy provided notification of exceeding Groundwater Protection Standard (GWPS) per §257.95(g), i.e., documentation that arsenic was present at statistically significant levels above the federal GWPS in five of six downgradient wells at the Karn Bottom Ash Pond.

EGLE approved the Karn Bottom Ash Pond Work Plan on December 20, 2018 based on the expectation that a report documenting the removal activities and certifying that solid waste had been removed in accordance with the work plan would be submitted at the completion of activities. Subsequently, EGLE approved the Response Action Plan on May 14, 2019 based on the

¹ TRC. 2019. Assessment of Corrective Measures – DE Karn Bottom Ash Pond Coal Combustion Residual Unit. Prepared for Consumers Energy Company. September 11.

anticipated submittal of the Assessment of Corrective Measures. Consumers Energy submitted for review and approval, *D.E. Karn Generating Facility Bottom Ash Pond CCR Removal Documentation Report* (Karn Bottom Ash Pond Closure Report) on October 30, 2019 to satisfy requirements for completing the removal of solid waste so that obtaining a solid waste operating license was unnecessary. The certification of solid waste removal was approved by EGLE on December 1, 2020.

Closure by removal has been achieved pursuant to 324.11519b(9)(b) by documenting the removal of sources of contamination under the response action plan. However, concentrations of arsenic in groundwater exceeding the GWPS pursuant to 40 CFR 257.95(h) have persisted within the compliance monitoring well network after the source removal activities were completed. EGLE has approved a remedy consistent with R 299.4444 and R 299.4445 of the Part 115 rules through the approval of the DE Karn Hydrogeological Monitoring Plan, Rev. 03 that includes the determination of Groundwater Not in an Aquifer and groundwater mixing zone authorization. Additional steps needed to address residual groundwater contamination are discussed in the observations and results sections below.

Karn Bottom Ash Pond Assessment Activities for this Period

Consumers Energy contracted WSP to develop a technical report to support the evaluation of what would be considered the most feasible pathway to address residual arsenic impacts in groundwater that have not attenuated once the source material had been excavated at the Karn Bottom Ash Pond. The *Remedy Selection Report - Bottom Ash Pond Alternatives Assessment for Groundwater Corrective Action Consumers Energy - Karn Complex*, prepared by WSP USA Inc. was submitted to EGLE on July 25, 2025 in anticipation of reviewing the alternatives analysis and preferred remedy.

Results of May 2025 Event

Statistical analysis from the May 2025 semiannual groundwater monitoring events verified that the only constituent of concern that is present at statistically significant levels above the established GWPS is arsenic. Results are presented in *May 2025 Assessment Monitoring Data Summary and Statistical Evaluation Consumers Energy, DE Karn Site, Bottom Ash Pond CCR Unit* and will be included in the 2025 Annual Groundwater Monitoring and Corrective Action Report per §257.90(e). Additionally, monitoring performed under the Karn Groundwater Surface-Water Interface (GSI) Compliance Plan demonstrates protection of human health and the environment with criteria determined to be protective at the point of exposure as presented in the quarterly hydrogeological monitoring reports submitted to the EGLE for the Karn Landfill.

Significant observations from the event summaries are as follows:

- Groundwater potentiometric surface within the area of the former Karn Bottom Ash Pond exhibits flow primarily moving west towards the intake channel, or south towards the Karn Generating Plant rather than radially from within the pond area;

- Regionally, radial flow is observed with a new “high” point shifted to the south of the former Karn Bottom Ash Pond towards OW-13;
- The groundwater elevation at DEK-MW-15003 has decreased and an overall flattening of the mounded groundwater has occurred as a result of the following operational changes:
 - In late 2023, the Karn Generating Facility stopped operating and consequently stopped routine discharge to the discharge ditch north of the Karn Lined Impoundment². This operational change triggered a decrease in local groundwater elevations; and
 - In late 2024, the Karn Lined Impoundment was taken out of service and closed by removal documented in DE Karn Lined Coal Ash Impoundment, Closure by Removal Certification, 40 CFR.102(c), prepared by Consumers Energy and submitted on July 25, 2025. The discharge ditch north of the Karn Lined Impoundment was cleaned out, backfilled, and graded to promote stormwater drainage.
- No additional Appendix IV constituents have been observed at statistically significant levels above GWPS for the Karn Bottom Ash Pond groundwater monitoring system;
- In addition to the groundwater flow direction changes mentioned above, redox conditions, which also affect contaminant transport, are still stabilizing in the Bottom Ash Pond Area following removal activities and will continue to be evaluated further;
- The mean arsenic concentration at DEK-MW-15002 is significantly lower than concentrations observed while the pond was in operation (prior to June 2018), indicating that the discontinuation of hydraulic loading to the Karn Bottom Ash Pond and the completed source removal of CCR was successful in removing a source of arsenic; and
- Although arsenic is present in site wells at concentrations above the GWPS established at the EPA maximum contaminant level (MCL) protective of the drinking water pathway, the drinking water pathway is not complete. Monitoring performed under the Michigan-approved GSI Compliance Monitoring Program demonstrates protection of human health and the environment with criteria determined to be protective at the potential point of exposure.
 - Groundwater monitoring locations along the DE Karn Intake Channel and boundary between the coal ash management areas and the power plant complex (DEK-MW-15002, DEK-MW-15005, DEK-MW-15006) document

² Discharge to this ditch was completed under authorization of the National Pollutant Discharge Elimination System (NPDES) permit.

contaminant concentrations of arsenic are less than the authorized mixing zone-based chronic concentration of 100 ug/L.

- Total chronic loading (i.e., mass flux), calculated from concentrations observed in transect groundwater samples collected from push-point samplers advanced at locations T1-3GSI through T6-3GSI, remains below the chronic mixing zone GSI criterion, indicating current conditions are protective of the GSI pathway.

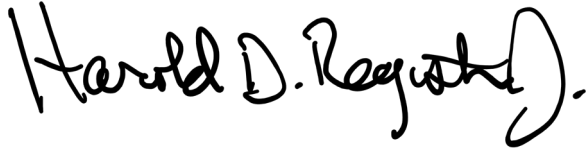
Conclusions

Source removal activities for the Karn Bottom Ash Pond have been completed and documented in the Karn Bottom Ash Pond Closure Report submitted to EGLE on October 30, 2019. Improvements in groundwater quality have been observed in the groundwater monitoring system following source removal, but observations of ongoing changes in groundwater potentiometric surface that may influence groundwater flow characteristics and/or alter groundwater redox conditions that could influence constituent concentrations, still require further evaluation before a final remedy can be selected. To aid in further evaluation, Consumers Energy installed six additional monitoring wells within the former Karn Bottom Ash Pond area that were integrated into the 2022 sampling schedule. Additionally, these groundwater monitoring wells have been instrumented with mini-Trols™ that measure the groundwater elevation to a calibrated datum on frequent basis to better understand the relationships between groundwater elevation and potential flux. Subsequent sampling events to include the additional monitoring wells will inform the on-going improvements and retention of monitoring-only, passive, or active remedial options following the source removal. As conditions continue to be evaluated post-source removal, the drinking water and GSI pathway are protected by quarterly monitoring performed under the Michigan-approved hydrogeological monitoring plan that includes a GSI Compliance Monitoring Program.

The final remedy for the Karn Bottom Ash Pond will be formally selected per §257.97 and Michigan Solid Waste requirements once the selected option is reviewed and commented on by EGLE and a public meeting is conducted at least 30-days prior to the final selection as required under §257.96(e). The *Remedy Selection Report - Bottom Ash Pond Alternatives Assessment for Groundwater Corrective Action Consumers Energy - Karn Complex*, prepared by WSP USA Inc. was submitted to EGLE on July 25, 2025 in anticipation of reviewing the alternatives analysis and preferred remedy.

The next semiannual progress report will be submitted in six months by January 31, 2026. Please feel free to contact me with any questions or clarifications.

Sincerely,



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