

Prepublication Copy Notice:

The Acting Assistant Administrator of the Office of Land and Emergency Management of the United States Environmental Protection Agency signed the following document on June 20, 2023:

Title: **Proposed Denial of Alternative Closure Deadline for Waukegan Generating Station**

Action: **Proposed Determination**

Docket No.: **EPA-HQ-OLEM-2023-0209**

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PROPOSED DETERMINATION

Proposed Denial of Alternative Closure Deadline for Waukegan Generating Station

EXECUTIVE SUMMARY:

Midwest Generation, LLC (MWG) owns and operates a coal-fired power plant, the Waukegan Generating Station (Waukegan), in Waukegan, Illinois. At Waukegan, MWG operates two 10-acre unlined coal combustion residuals (CCR) surface impoundments, the East Ash Pond (EAP) and the West Ash Pond (WAP). The ponds were utilized in alternating fashion, with one pond receiving wastestreams while the other pond was being cleaned out. On April 11, 2021, the WAP ceased accepting CCR and non-CCR waste. Every day the EAP receives 3 million gallons of non-CCR waste and formerly received 1.9 million gallons of sluiced CCR until the coal-fired units' retirement in 2022. The EAP sits approximately 1,000 feet from Lake Michigan.

Under the United States Environmental Protection Agency (EPA) regulations for CCR landfills and surface impoundments, 40 C.F.R. § 257.101(a), unlined CCR surface impoundments such as the EAP were required to cease receipt of all CCR and non-CCR wastestreams by April 11, 2021. This deadline was established after the United States Court of Appeals for the District of Columbia Circuit found that EPA erred when it established a rule that allows unlined CCR surface impoundments to continue to operate until they leak despite the Agency's conclusions that "unlined impoundments have a 36.2 to 57% chance of leakage at a harmfully contaminating level" and that such leaks, when they occur, pose substantial risks to humans and the environment. *See Utility Solid Waste Activities Group v. EPA*, 901 F.3d 414,

427-428 (D.C. Cir. 2018) (finding that “[i]t is inadequate under RCRA for the EPA to conclude that a major category of impoundments that the agency’s own data show are prone to leak pose ‘no reasonable probability of adverse effects on human health or the environment,’ 42 U.S.C. § 6944(a), simply because they do not already leak.”). Despite the risks posed by unlined CCR surface impoundments, EPA’s regulations provide an opportunity for such impoundments to continue to operate beyond April 11, 2021, if the owner or operator (O/O) submits a demonstration showing that the facility meets the criteria for 40 C.F.R. § 257.103(f)(1).

On November 30, 2020, MWG submitted a demonstration (referred to as the “Demonstration” in this document) to EPA for the Waukegan facility. MGW seeks an extension pursuant to 40 C.F.R § 257.103(f)(1) to allow the EAP to continue to receive CCR wastestreams until October 11, 2023,¹ and non-CCR wastestreams until June 16, 2023. The WAP is also subject to the regulations in 40 C.F.R. §257.101(a). This surface impoundment ceased receipt of CCR and non-CCR wastestreams on April 11, 2021, and therefore an extension is not required. After EPA determined the Demonstration request was complete on January 11, 2021, the requirement to close the EAP was tolled pending a final decision by EPA. 40 C.F.R. § 257.103(f)(3)(ii).

EPA is proposing to find that MWG is not in compliance with all of the requirements of Part 257 regulations. Specifically, EPA is proposing to find that MWG’s selected alternative capacity will prevent the WAP from meeting the closure by removal standards, and therefore, EPA must deny MWG’s selected alternative capacity. The proposed decision is based on EPA’s

¹ On June 15th, 2023, Midwest Generation requested an extension to the original October 2023 deadline. MWG is requesting October 2024 as the new deadline.

evaluation of the information provided in MWG's Demonstration and other information in the docket for this action.

DATES: *Comments.* Comments must be received on or before August 4, 2023.

ADDRESSES AND PUBLIC PARTICIPATION: The EPA has established a docket for this notice under Docket ID No. EPA-HQ-OLEM-2023-0209. EPA established a docket for the August 28, 2020, CCR Part A Rule under Docket ID No. EPA-HQ-OLEM-2019-0172.² All documents in the docket are listed in the <https://www.regulations.gov> index. Publicly available docket materials are available either electronically at <https://www.regulations.gov> or in hard copy at the EPA Docket Center. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the EPA Docket Center is (202) 566-1742. You may send comments, identified by Docket ID. No. EPA-HQ-OLEM-2023-0209, by any of the following methods:

- Federal e-Rulemaking Portal: <https://www.regulations.gov> (our preferred method).
Follow the online instructions for submitting comments.
- Mail: U.S. Environmental Protection Agency, EPA Docket Center, Office of Land and Emergency Management, Docket ID No. EPA-HQ-OLEM-2023-0209, Mail Code 28221T, 1200 Pennsylvania Avenue NW, Washington, DC 20460.
- Hand Delivery or Courier (by scheduled appointment only): EPA Docket Center, WJC West Building, Room 3334, 1301 Constitution Avenue NW, Washington, DC 20004. The

² See Section II.A of this document for more information on the CCR Part A Rule.

Docket Center's hours of operations are 8:30 a.m. – 4:30 p.m., Monday – Friday (except Federal Holidays).

INSTRUCTIONS: All submissions received must include the Docket ID number (EPA-HQ-OLEM-2023-0209) for this action. Comments received may be posted without change to <https://www.regulations.gov>, including any personal information provided. Once submitted, comments cannot be edited or removed from the docket. The EPA may publish any comment received to its public docket. Do not submit electronically any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (i.e., on the web, cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit <https://www.epa.gov/dockets/commenting-epa-dockets>.

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- For more information on coal ash regulations, please visit <https://www.epa.gov/coalash>.

SUPPLEMENTARY INFORMATION:

Table of Contents

I. General Information 7

 A. The Decision the Agency is Proposing..... 7

 B. The Agency’s Authority for this Proposed Decision..... 8

II. Background..... 8

 A. Summary of the Part A Rule..... 8

 B. Description of Waukegan Generating Station and Summary of Request for Extension ... 13

III. EPA Analysis of Demonstration..... 17

 A. Evaluation of MWG’s Claim of No Alternative Disposal Capacity for non-CCR
 Wastestreams On- or Off-Site..... 18

 B. Evaluation of MWG’s Analysis of Adverse Impacts to Plant Operations..... 21

 C. Evaluation of MWG’s Site-Specific Analysis for Alternative Capacity Selected..... 22

 D. Evaluation of MWG’s Justification for Time Requested to Develop the Selected
 Alternative..... 24

 E. Evaluation of MWG’s Compliance Documentation..... 26

IV. EPA’s Proposed Action..... 49

V. Conclusion..... 56

VI. Effective Date 57

List of Acronyms

- ASD – Alternate source demonstration
- CBI – Confidential business information
- CCR – Coal combustion residuals
- C.F.R. – Code of Federal Regulations
- CYRB – Coal Yard Runoff Basin
- EAP – East Ash Pond
- EPA – Environmental Protection Agency or the Agency
- EYCB – East Yard Collection Basin
- GWMCA – Groundwater monitoring and corrective action
- IEPA – Illinois Environmental Protection Agency
- IPCB – Illinois Pollution Control Board
- LEAF – Leaching environmental assessment framework
- L/S – Liquid-to-solid ratio
- LSP – Liquid-solid partitioning
- LVWP – Low Volume Waste Pond
- MCT – Main Collection Tank
- MGD – Million gallons per day
- MWG – Midwest Generation, LLC
- O/O – owner(s) or operator(s)

RCRA – Resource Conservation and Recovery Act

RTO – Regional transmission organization

SSC – Submerged scraper conveyor

SSI – Statistically significant increase

SSL – Statistically significant level

TDS – Total dissolved solids

Waukegan – Waukegan Generating Station

WAP – West Ash Pond

WWTP – Wastewater treatment plant

WYRB – West Yard Runoff Basin

I. General Information

A. The Decision the Agency is Proposing.

EPA is proposing to deny the closure extension request submitted by MWG for an unlined CCR surface impoundment, the EAP, located at the Waukegan Generating Station in Waukegan, Illinois. MWG submitted a Demonstration to EPA seeking an extension pursuant to 40 C.F.R § 257.103(f)(1) to allow the impoundment to continue to receive CCR and non-CCR wastestreams after April 11, 2021. In the Demonstration, MWG requests an alternative closure deadline of June 16, 2023, for the EAP to cease receiving non-CCR wastestreams and October 11, 2023 for CCR wastestreams. Alternate capacity for CCR wastestreams is no longer necessary due to the early retirement of the coal-fired units on June 1, 2022. EPA is proposing to find that MWG failed to show that the facility is in compliance with the CCR regulations. For that reason, EPA is proposing that MWG cease receipt of waste non-CCR wastestreams into the CCR surface

impoundment no later than 135 days after EPA issues a final decision or the date for cease receipt of waste set by 40 C.F.R. Section 257.103(f)(1)(vi)(A) and (B) (**Maximum time frames**), whichever arrives first.

B. The Agency's Authority for this Proposed Decision.

This proposal is being issued pursuant to the authority in 40 C.F.R. § 257.103(f).

II. Background

A. Summary of the Part A Rule

In April 2015, EPA issued its first set of regulations establishing requirements for CCR surface impoundments and landfills. “Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities,” 80 FR 21302 (April 17, 2015). In 2020, EPA issued revisions to that rule. “Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; A Holistic Approach to Closure Part A: Deadline to Initiate Closure rule,” 85 FR 53516 (Aug. 28, 2020) (the “Part A Rule”). The Part A Rule established April 11, 2021, as the date that electric utilities must cease placing waste into all unlined CCR surface impoundments. The Part A Rule also revised the alternative closure provisions of the CCR regulations (40 C.F.R. § 257.103) by allowing O/O to request an extension to continue to receive CCR and/or non-CCR wastestreams in unlined CCR surface impoundments after April 11, 2021, provided that certain criteria are met. EPA established two site-specific alternatives to initiate closure of unlined CCR surface impoundments (40 C.F.R. § 257.103(f)), commonly known as extensions of the date to cease receipt of waste.

The first alternative is for a facility that must continue to use an unlined CCR surface impoundment after April 11, 2021, because no alternative capacity is available either on-site or off-site, and it was technically infeasible to develop alternative capacity by that date. 40 C.F.R. §

257.103(f)(1) (titled “*Development of alternative capacity is technically infeasible.*”). The second alternative is for coal-fired boiler(s) that are going to permanently shut down by a date certain after April 11, 2021, but there is no alternative capacity either on- or off-site that is available to accept the CCR and non-CCR wastestreams between April 11, 2021, and the permanent closure date of the coal-fired boiler. 40 C.F.R. § 257.103(f)(2) (titled “*Permanent cessation of coal-fired boiler(s) by a date certain.*”).

In this case, MWG is requesting an extension under the first Part A alternative. Under this alternative, an O/O may submit a demonstration seeking EPA approval to continue using its unlined CCR surface impoundment for the specific amount of time needed to develop alternative disposal capacity for its CCR and/or non-CCR wastestreams. EPA may grant an extension of the deadline to cease receipt of waste if the facility demonstrates that the requirements of 40 C.F.R. § 257.103(f)(1) are met. Specifically, the regulation requires the facility to demonstrate that 1) no alternative disposal capacity is currently available on- or off-site of the facility; 2) the CCR and/or non-CCR waste stream must continue to be managed in that CCR surface impoundment because it was technically infeasible to complete the measures necessary to obtain alternative disposal capacity either on- or off-site at the facility by April 11, 2021; and 3) the facility is in compliance with all the requirements of 40 C.F.R. part 257, subpart D. 40 C.F.R. §§ 257.103(f)(1)(i)-(iii).

Under the first requirement, the O/O must demonstrate that there is no alternative disposal capacity available on- or off-site. 40 C.F.R. § 257.103(f)(1)(i). As part of this requirement, the O/O must evaluate all potentially available disposal options to determine whether any are technically feasible. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1). The O/O must also evaluate the site-specific conditions that affected the options considered. 40 C.F.R. §

257.103(f)(1)(iv)(A)(1)(i). Additionally, the regulations prohibit the O/O from relying on an increase of cost or inconvenience of existing capacity as a basis for meeting this criterion. 40 C.F.R. § 257.103(f)(1)(i).

The Demonstration must substantiate the absence of alternative capacity for each wastestream that the facility is requesting to continue placing in the CCR surface impoundment beyond April 11, 2021. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1). As soon as alternative capacity is available for any of the wastestreams, the O/O must use that capacity to dispose of those wastestreams instead of using the unlined CCR surface impoundment. 40 C.F.R. § 257.103(f)(1)(v). This means that if there is a technically feasible option to reroute any of the wastestreams away from the unlined surface impoundment, the O/O must implement the alternative. 40 C.F.R. §§ 257.103(f)(1)(ii) and (v). In the CCR Part A Rule preamble, EPA acknowledged that some of these wastestreams are very large and will be challenging to relocate, especially for those that are sluiced. However, the smaller volume wastestreams have the potential to be rerouted to temporary storage tanks. In such cases, the O/O must evaluate this option, and, if it is determined to be technically feasible, must implement it. 85 Fed. Reg. 53,541.

EPA also stated in the Part A Rule that it is important for the O/O of a facility to include an analysis of the adverse impacts to the operation of the power plant if the CCR surface impoundment cannot be used after April 11, 2021. EPA stated that this is an important factor in determining whether the disposal capacity of the CCR surface impoundment in question is truly needed by the facility. EPA required that a facility provide analysis of the adverse impacts that would occur to plant operations if the CCR surface impoundment in question were no longer available. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1)(ii).

In addition, to support the alternative deadline requested in the demonstration, the O/O must submit a workplan that contains a detailed explanation and justification for the amount of time requested. 40 C.F.R. § 257.103(f)(1)(iv)(A). The written workplan narrative must describe each option that was considered for the new alternative capacity selected, the time frame under which each potential capacity could be implemented, and why the facility selected the option that it did. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1). The discussion must include an in-depth analysis of the site and any site-specific conditions that led to the decision to implement the selected alternative capacity. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1)(i).

The workplan must contain a visual timeline and narrative discussion to justify the time requested. 40 C.F.R. § 257.103(f)(1)(iv)(A)(3). The visual timeline must clearly indicate how each phase and the steps within that phase interact with or are dependent on each other and the other phases. Additionally, any possible overlap of the steps and phases that can be completed concurrently must be included. This visual timeline must show the total time needed to obtain the alternative capacity and how long each phase and step is expected to take. The detailed narrative of the schedule must discuss all the necessary phases and steps in the workplan, in addition to the overall time frame that will be required to obtain capacity and cease receipt of waste. The discussion must include 1) why the length of time for each phase and step is needed and a discussion of the tasks that occur during the specific step; 2) why each phase and step must happen in the order it is occurring; 3) the tasks that occur during each of the steps within the phase; and 4) anticipated worker schedules. 40 C.F.R. § 257.103(f)(1)(iv)(A)(3). This overall discussion of the schedule assists EPA in understanding whether the time requested is warranted. Finally, facilities must include a narrative on the progress made towards the development of alternative capacity as of the time the demonstration was compiled. 40 C.F.R. §

257.103(f)(1)(iv)(A)(4). This section of the Demonstration is intended to show the progress and efforts the facility has undertaken to work towards ceasing placement of waste in the unlined CCR surface impoundment and to determine whether the submitted schedule for obtaining alternative capacity was adequately justified at the time of submission.

The Part A Rule also requires that a facility be in compliance with all the requirements of 40 C.F.R. part 257 subpart D in order to be approved for an extension. 40 C.F.R. § 257.103(f)(1)(iii). Various compliance documentation must be submitted with the demonstration for the entire facility, not just for the CCR surface impoundment in question. 40 C.F.R. § 257.103(f)(1)(iv)(B). Additionally, the information presented in the narrative of the demonstration and material posted on the facility's CCR website relating to the closure or retrofit of the impoundment and the development of the new alternative disposal capacities are considered by EPA to allow for an adequate analysis of the facility's compliance with the CCR regulations.

The first group of compliance documents required to be included in the demonstration relate to documentation of the facility's compliance with the requirements governing the design, construction, and installation of the groundwater monitoring systems, as well as sampling and analysis of data obtained from those systems. The rule specifically requires copies of the following documents: 1) map(s) of groundwater monitoring well locations (these maps should identify the CCR units as well); 2) well construction diagrams and drilling logs for all groundwater monitoring wells; 3) maps that characterize the direction of groundwater flow accounting for seasonal variation; 4) constituent concentrations, summarized in table form, at each groundwater monitoring well monitored during each sampling event; and 5) descriptions of

site hydrogeology including stratigraphic cross-sections. 40 C.F.R. §§ 257.103(f)(1)(iv)(B)(2)-(4).

The second group of documents required under the regulations are those necessary to demonstrate compliance with the corrective action regulations, if applicable. To comply with this requirement, a facility that triggered corrective action must at the least submit the following documentation: the corrective measures assessment required at 40 C.F.R. § 257.96; progress reports on remedy selection and design; and the report of final remedy selection required at 40 C.F.R. § 257.97(a). 40 C.F.R. §§ 257.103(f)(1)(iv)(B)(5) and (6).

Finally, the regulations require facilities to submit the most recent structural stability assessment required at 40 C.F.R. § 257.73(d), and the most recent safety factor assessment required at 40 C.F.R. § 257.73(e) and §§ 257.103(f)(1)(iv)(B) (7) and (8).

B. Description of Waukegan Generating Station and Summary of Request for Extension

On November 30, 2020, MWG submitted a Demonstration pursuant to 40 C.F.R. § 257.103(f)(1) requesting additional time to develop alternative capacity to manage CCR and non-CCR wastestreams at the Waukegan Generating Station near Waukegan, Illinois. MWG is the O/O of the Waukegan Generating Station. EPA reviewed the Waukegan Demonstration to determine whether it included the information, analyses, and documentation required under 40 C.F.R. § 257.103(f)(1). On January 11, 2022, EPA notified MWG that its demonstration was deemed complete, and, pursuant to 40 C.F.R. § 257.103(f)(3)(ii), that its completeness determination tolled the April 11, 2021, cease receipt of waste date for the unlined EAP surface impoundment until EPA issues a final decision on this proposed action.³

³ Waukegan Completeness Letter, January 11, 2022.

As previously discussed, MWG requested an extension under the first alternative, which requires creating alternative capacity for the CCR and non-CCR wastestreams routed to the EAP. After the Demonstration submittal, MWG provided an update of the extension request on March 1, 2022, to the Agency.⁴ The following information was provided: On June 17, 2021, MWG's parent company, NRG Energy, Inc., announced that coal-fired Units 7 and 8 would retire by June 1, 2022.⁵ Shortly thereafter, MWG determined that alternative disposal capacity for CCR wastestreams (i.e., dry bottom ash transport water and the fly ash transport water) was no longer necessary as these wastestreams would cease upon coal-fired retirement. MWG still plans to build capacity for non-CCR wastestreams, which are currently routed to the EAP, as Waukegan will continue to operate two ultra-low-sulfur diesel-fired peaking units and therefore capacity is needed to manage these wastestreams. MWG plans to repurpose the WAP for non-CCR wastestream capacity. The WAP will be closed by removal⁶ and the footprint and liner will be reused for the new low volume waste pond (LVWP). As a result, MWG did not request an updated cease receipt of waste date as non-CCR capacity is still needed. Since capacity for CCR wastestreams is no longer necessary, EPA will not evaluate alternative capacities considered for CCR wastestreams. However, EPA will evaluate the alternative capacities for non-CCR wastestreams as it relates to the extension request. In the Demonstration, MWG requests an alternative deadline of October 11, 2023, for CCR wastestreams and June 16, 2023, for non-CCR wastestreams routed to the EAP.

⁴ Waukegan Demonstration Update, March 1, 2022.

⁵ In July 2022, MWG confirmed the retirement of Waukegan's coal-fired units. Waukegan and Will County CCR Part A Demonstration Retirement Update – Email.

⁶ See Section III.E.1 of this proposal for discussion on the WAP's closure by removal.

To assist the readers' review, EPA provides additional details on Waukegan below, including information on its CCR surface impoundments. This summary is based on information provided in the Demonstration.

1. Coal-Fired Boilers and Generating Capacity

MWG operated two coal-fired generating units, Units 7 and 8, with a combined generation capacity of 680 net megawatts. MWG retired the two units in June 2022, and it plans to continue operating two ultra-low-sulfur diesel-fired peaking units.

2. CCR Units, CCR, and Non-CCR Wastestreams

MWG currently operates two CCR units at Waukegan that are subject to federal CCR regulations. The two units are CCR surface impoundments named the EAP (subject to the Demonstration) and WAP, which were used interchangeably during Waukegan's operational history. The EAP has a surface area of 9.8 acres with a storage capacity of 184,000 cubic yards. The WAP has a surface area of 10 acres with a storage capacity of 223,000 cubic yards. Both ponds are unlined CCR surface impoundments and subject to closure pursuant to 40 C.F.R. § 257.101(a)(1). This provision provides that MWG must cease placing CCR and non-CCR wastestreams into the unit and either retrofit the unit or initiate closure as soon as technically feasible, but not later than April 11, 2021. As such, the WAP ceased accepting CCR and non-CCR waste on April 11, 2021.

In the History of Construction Report for the EAP and WAP, MWG advises that there is limited information on the construction of the ponds. However, construction drawings from 1977 show the ponds were built by widening existing berms with compacted fill and separating the two ponds with a berm. During this time, the ponds were lined with a Hypalon liner. In 2003 (for the EAP) and 2005 (for the WAP) the Hypalon liner was replaced with a 60-mil smooth high-

density polyethylene geomembrane liner. The liners do not meet the liner design criteria found in 40 C.F.R §257.71.

As of the date the Demonstration was submitted, the ponds receive the following CCR wastestreams: bottom ash transport water, economizer ash transport water, and boiler slag. The following non-CCR wastestreams flow into the ponds: Coal Yard Runoff Basin (CYRB) effluent and Main Collection Tank (MCT) effluent. These CCR and non-CCR wastestreams total 4.9 million gallons per day (MGD) or 1.9 MGD of CCR wastestreams and 3.0 MGD of non-CCR wastestreams.^{7,8}

During Waukegan's operation only one pond at a time was utilized, with CCR and non-CCR wastestreams being treated via sedimentation. Once settled, the wastewater exited the pond to the recycle water sump. The wastewater within the recycle water sump was then pumped to the sluice water head tank to be reused in the bottom ash handling systems or clarified and discharged via a National Pollutant Discharge Elimination System (NPDES)-permitted outfall (IL0002259) to Lake Michigan. When a pond reached storage capacity, the wastewater was redirected to the other pond. The ash was then dewatered and excavated for off-site disposal or beneficial use.

The Demonstration states that the ponds are compliant with location restrictions specified in 40 C.F.R §§ 257.60 through 257.64.

⁷ Demonstration, Table 2, PDF page 11.

⁸ As of April 11, 2021, the WAP no longer receives CCR and non-CCR wastestreams.

3. *Non-CCR Units*

The Demonstration gives little details on the non-CCR units at Waukegan, which are the CYRB, West Yard Runoff Basin (WYRB), and East Yard Collection Basin (EYCB).⁹ The WYRB overflows into the CYRB which flows into the EAP. The EYCB manages contact stormwater, station drain wastewater, and wastestreams from the reverse osmosis system. The EYCB effluent is discharged via NPDES-permitted Outfall 001. MWG states that the EYCB has a capacity of 4.9 MG, however, no information is given about the capacity of the CYRB and WYRB.

III. EPA Analysis of Demonstration

EPA is proposing to deny the extension request for the EAP at Waukegan because it failed to 1) consider individual wastestreams and 2) conduct a site-specific analysis for the alternative capacity selected. EPA is also proposing to deny the extension request because MWG has not demonstrated that the facility is in compliance with all the requirements of 257 subpart D, based on concerns with the groundwater monitoring at the facility and with the WAP's closure plan. EPA is proposing for MWG to cease placement of all CCR and non-CCR wastestreams into the EAP no later than 135 days from the issuance of EPA's final decision¹⁰ or the date for cease receipt of waste set by 40 C.F.R. Section 257.103(f)(1)(vi)(A) and (B) (**Maximum time frames**), whichever arrives first.

As stated in Section II.B., EPA did not evaluate MWG's analysis of alternative capacities for CCR wastestreams as Waukegan's two coal-fired units have retired and CCR capacity is no

⁹ Demonstration, Appendix A, Drawing WKG-CSK-001, PDF page 79.

¹⁰ See discussion in Section IV of this proposal.

longer needed. The following is a summary of EPA's analysis of the Demonstration: EPA first discusses MWG's evaluation of on- and off-site capacity and the proposed finding that MWG failed to consider individual wastestreams in off-site analyses. 40 C.F.R. §§ 257.101(a)(1); 257.103(f)(1)(iv)(A)(1); and 257.103(f)(1)(v). Next, EPA analyzes the impacts on the facility if the EAP cannot be used through the proposed extension date. EPA then discusses MWG's evaluation of the site-specific analysis for the alternative capacity selected and the proposed finding that the analysis is insufficient as the selected alternative capacity will prevent MWG from meeting the closure by removal standard. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1)(i). EPA's analysis of the Demonstration workplan finishes with an evaluation of MWG's justification for the time requested. Finally, this section concludes with EPA's analysis of MWG's compliance with the other requirements of the subpart D regulations.

A. Evaluation of MWG's Claim of No Alternative Disposal Capacity for non-CCR

Wastestreams On- or Off-Site

As discussed above in Section II.A, to obtain an extension of the cease receipt of waste deadline, the O/O must demonstrate that there is no alternative disposal capacity available on- or off-site. 40 C.F.R. § 257.103(f)(1)(iv)(A). In this case, the Demonstration provides an analysis of the potential alternative disposal options both on- and off-site as required by the Part A Rule. EPA is proposing to find that MWG failed to consider individual wastestreams for off-site alternatives.

1. Existing On-Site Capacity Alternatives

In Demonstration Section 1.3.1, MWG evaluated existing on-site capacity for non-CCR wastestreams and concluded that there is no additional capacity available. EPA is proposing to agree with MWG's conclusion on the alternatives considered. In Demonstration Section 1.3.1.2,

MWG evaluated on-site options for non-CCR wastestreams, which included diverting them to the EYCB or to Waukegan's clarifiers, or temporarily storing them.

In Demonstration Section 1.3.1.2.1, MWG analyzed diverting non-CCR wastestreams to the EYCB. MWG states that 3.0 MGD of capacity is needed for the non-CCR wastestreams currently managed by the EAP. This capacity is approximately 60% of the EYCB's available capacity, which means the basin would need to increase its NPDES discharge rate or interim capacity would need to be installed. For either method, the existing NPDES permit would require modification and piping would need to be constructed to divert the flows from the EAP. MWG estimates this project would take three years or until fall 2023.

In Demonstration Section 1.3.1.2.2, MWG evaluates diverting non-CCR wastestreams to the station's two clarifiers. Currently, the clarifiers remove suspended solids from pond effluent prior to discharge in Lake Michigan. The sludge within the clarifier is vacuumed for off-site disposal as needed. To handle the additional wastestreams, MWG states it would need to modify the clarifiers' sludge dewatering system and sludge pump, and expand the capacity. In addition to modifying the clarifiers, MWG would need to seek modification of its NPDES permit and construct piping to divert flows. This project is expected to take 2.5 years.

In Demonstration Section 1.3.1.2.3, MWG evaluated holding the individual non-CCR wastestreams at their sources (i.e., CYRB and MCT) in lieu of discharging them into the EAP. MWG determined that neither the CYRB nor the MCT have the capacity to withhold wastestreams while more permanent capacity is created. MWG estimated that 2.5 years of storage would be necessary while the alternative capacity was created for CCR wastestreams.

2. *Off-Site Capacity Alternatives for Non-CCR Wastestreams*

In Demonstration Section 1.3.2, MWG concluded that off-site alternative capacity was not a technically feasible option for the CCR and non-CCR wastestreams currently routed to the EAP. As discussed below, EPA is proposing to determine that MWG failed to consider individual wastestreams in the analysis for off-site capacities. As stated in the Part A Rule preamble, “[T]he final rule requires owners and operators to cease using the CCR surface impoundment as soon as feasible, to document the lack of both on and off-site capacity for each individual wastestream, and expressly requires that as capacity for an individual wastestream becomes available, owners or operators are required to use that capacity...” 85 FR 53541. *See also* 40 C.F.R. §§ 257.101(a)(1); 257.103(f)(1)(iv)(A)(1); and 257.103(f)(1)(v). The Demonstration failed to explain why individual wastestreams were not considered, as required by the Part A Rule. Therefore, EPA is proposing to find that MWG’s analysis is inadequate.

In the Demonstration, MWG evaluated off-site capacities for all wastestreams. One option evaluated was transporting all the wastestreams to a wastewater treatment plant (WWTP). MWG identified seven WWTPs within 20 miles of Waukegan, in which three are designed to accept the capacity needed. In this scenario, infrastructure would be required to pump the flows from their sources into a tanker truck. MWG also estimated that 600 truckloads per day would be required to transport all CCR and non-CCR wastestreams to a WWTP. MWG stated that the daily truck traffic would introduce significant logistical concerns at Waukegan. MWG concluded that this option is not technically feasible.

As noted above, MWG did not consider individual wastestreams and so it did not discuss if these WWTPs could accept any individual CCR or non-CCR wastestream as required by the regulations. In fact, MWG did not even claim to have evaluated the wastestreams individually,

much less provide documentation substantiating its claim that every individual wastestream must continue to be managed in the EAP.

EPA is proposing to find that the analysis demonstrating no available off-site alternative disposal capacity for the CCR and non-CCR wastestreams is inadequate because MWG failed to evaluate individual wastestreams.

B. Evaluation of MWG's Analysis of Adverse Impacts to Plant Operations

The Part A Rule next requires that O/O of a facility provide analysis of the adverse impacts that would occur to plant operations if the CCR surface impoundment in question were no longer available. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1)(ii). MWG provided a justification in its Demonstration as required, and, for the reasons discussed below, EPA is proposing to find that there would be adverse impacts to the power plant if the EAP could not be used after April 11, 2021.

In Section 1.1.3 of the Demonstration, MWG asserted that if the EAP were required to cease receipt of waste, then it would have to cease producing power as the EAP is the only available capacity for Waukegan's CCR and non-CCR wastestreams. MWG has two other facilities affected by the Part A Rule and if they cannot dispose of their CCR, then they would also be forced to shut down. All three of the MWG facilities are located in the same zone of the PJM regional transmission organization (RTO). MWG stated that if it was advised to shut down these facilities, it would cause major financial harm and loss of jobs and could potentially increase the cost for customers. Furthermore, MWG stated that the facilities have an obligation to supply this capacity to the PJM RTO.

EPA understands that requiring MWG to immediately cease placement of waste is not feasible without impacts to Waukegan. EPA proposes to find that if Waukegan were unable to

continue using the EAP, and if no other on- or off-site alternative capacity is available, there would be adverse impacts on the ability to run the associated boilers such that a longer planned temporary outage would likely be required.

C. Evaluation of MWG's Site-Specific Analysis for Alternative Capacity Selected

As discussed above in Section II.A, the regulations require MWG to demonstrate that it is requesting the fastest technically feasible time frame to develop its selected alternative capacity option, and that the development of any of the available alternatives to manage the wastestreams was not feasible prior to April 11, 2021. To support these findings, MWG must submit a detailed justification for the amount of time requested that includes 1) a description of each option that was considered; 2) the time frame under which each potential capacity could be implemented; and 3) why it selected the option that it did, along with an in-depth analysis of the site and any site-specific conditions that led to the decision to implement the selected alternative capacity. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1)(i). These factors assist EPA in understanding whether the time requested is warranted. EPA has evaluated MWG's analysis and is proposing to conclude that it is insufficient as the selected alternative capacity will prevent the WAP from meeting the closure by removal standard. 40 C.F.R. § 257.102 (c). *See* Section III.E.1 of this proposal for further discussion.

In Demonstration Section 1.3.3, MWG explained that no current capacity exists on- or off-site and, therefore, new capacity must be created to address all CCR and non-CCR wastestreams. MWG considered the following technologies to manage wastestreams: retrofitting the WAP, installing geotextile filter tubes, installing a concrete ash-settling tank, and installing an under-boiler or remote submerged scraper conveyor (SSC). EPA did not evaluate the different

technologies considered for CCR wastestreams because capacity for them is no longer needed, and, therefore, an outline of them is not provided.¹¹

In Demonstration Section 1.3.3.2, MWG discussed the option selected and its justification. The selected option is a multiple technology solution that includes a remote SSC and repurposing a portion of the WAP as a new LVWP. MWG now plans to use the entire WAP for the new LVWP, which would include closing the WAP by removal of all CCR, decontamination of the existing liner and concrete structures, and reuse of these structures for the LVWP. MWG selected this solution as it can be implemented the fastest due to utilizing existing infrastructure. MWG stated that this option separates CCR and non-CCR wastestreams, which will allow it to meet the Effluent Limitation Guidelines requirements. As stated in the March 1, 2022, update, MWG no longer needs CCR wastestream capacity and, therefore, it decided to not pursue the remote SSC. However, MWG still plans to continue construction of the LVWP for non-CCR wastestreams, which is estimated to be complete by June 16, 2023.

EPA is proposing to determine that MWG failed to conduct an in-depth analysis of the site-specific conditions that led to the decision to implement the selected alternative capacity. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1)(i). Specifically, EPA cannot approve the selected alternative capacity as the workplan does not describe how MWG will feasibly reuse the WAP's liner while also simultaneously meeting the closure by removal standard. *See* Section III.E.1 of this proposal for further discussion.

¹¹ *See* Section II.B of this proposal.

D. Evaluation of MWG's Justification for Time Requested to Develop the Selected Alternative

As discussed above in Section II.A, facilities must demonstrate that the amount of time requested is the fastest technically feasible to develop the selected alternative disposal capacity by including a visual timeline and narrative discussion. 40 C.F.R. §§ 257.103(f)(1)(iv)(A)(1)(iii) and (A)(3). EPA has concerns that the estimated time frame is significantly delayed due to the state petition and state permit processes.

In Demonstration Section 1.4.2 and the March 1, 2022, update, MWG outlined the timeline of how the LVWP will be constructed within the footprint of the WAP. MWG plans to close the WAP by removal, decontaminate the existing liner and concrete structures, and reuse these structures for the LVWP. As it relates to the extension request, the Illinois CCR rule (i.e., Part 845 to Title 35 of the Illinois Administrative Code) allows the reuse of competent geomembrane liners when retrofitting an existing CCR surface impoundment,¹² however, the closure by removal regulations require the liner to be removed regardless of its condition.¹³ To reuse the liner, MWG is required to file an Amended Petition for an Adjusted Standard with the Illinois Pollution Control Board (IPCB). 35 Illinois Administrative Code § 845.740(a). MWG claimed that removing the liner would add significant time to the project. Therefore, MWG filed the petition on May 11, 2021.¹⁴ The Illinois Environmental Protection Agency (IEPA) is also required to submit its recommendation, which was due to the IPCB on May 26, 2022. Thereafter, MWG may file a response. In addition to the petition, on January 28, 2021, MWG submitted a

¹² 35 Illinois Administrative Code 845.770(a)(4).

¹³ 35 Illinois Administrative Code 845.740(a).

¹⁴ See Waukegan Generating Station IPCB Petition AS 2021-003. Available on the publicly accessible CCR website at <https://pcb.illinois.gov/documents/dsweb/Get/Document-104077> (Accessed April 19, 2023).

state closure construction permit application for the EAP and WAP with the IEPA. The permit is contingent on when the IPCB issues a ruling on the petition as the applications are interrelated. MWG estimated the permitting process will take about 12 months or until January 2023. Once MWG obtains the state permit, it will close the WAP by removal and decontaminate the liner, which is estimated to take until April 2023. MWG estimated it will take an additional 3 months for the IEPA to review and approve the liner decontamination work and the final closure report. Once the WAP is certified closed, MWG will install effluent piping to and from the pond area, which is estimated to take a couple of weeks.¹⁵ Thereafter, the LVWP will be operational. In its March 2022 update, MWG estimated that the LVWP would not be operational until July 2023, which is beyond the requested date of June 16, 2023. MWG stated that it is not requesting an updated extension date as the overall schedule could progress faster than expected.

EPA has concerns with delays to the timeline outlined above. The IEPA did not submit their petition recommendation until October 31, 2022, or 5 months past the original May 26, 2022, deadline.¹⁶ In addition, as stated above, MWG may respond to the IEPA's recommendation, which is due April 28, 2023.¹⁷ This delays the original timeline by 11 months. The EPA does not see how the extension date of June 16, 2023, is technically feasible. The closure construction permit still must be issued by IEPA and the WAP must be certified closed to be reused as the LVWP. MWG also has not requested additional time as permitted pursuant to 40 C.F.R 257.103(f)(1)(vii).

¹⁵ Demonstration, Section 3.7.1.3, PDF pages 68–69.

¹⁶ October 2022 IEPA Recommendation IPCB Petition AS 2021-003.

¹⁷ According to IPCB's website <https://pcb.illinois.gov/> case number AS 2021-003.

E. Evaluation of MWG's Compliance Documentation

The Part A Rule requires that a facility must be in compliance with all the requirements of 40 C.F.R. part 257 subpart D to be approved for an extension of the cease receipt of waste deadline. 40 C.F.R. § 257.103(f)(1)(iii). EPA is proposing to determine that MWG has not adequately demonstrated compliance with the closure performance standard and groundwater monitoring requirements in these CCR regulations.

1. Proposed Finding that MWG's Closure Plan Fails to Describe How its Closure of the WAP will Meet the Closure by Removal Standard

EPA is proposing to deny MWG's application on the grounds that its closure plan for the WAP does not meet the requirements in 40 C.F.R. § 257.102(b)(1). As discussed below, the available information is insufficient to allow EPA to determine whether the closure performance standards will be met. This violates 40 C.F.R. § 257.102(b)(1)(ii) and (iii), which require facilities to develop a written closure plan documenting the steps that will be taken to complete closure and to ensure the performance standards are met.

When closing a CCR surface impoundment by removal, an O/O must remove all CCR from the unit and decontaminate all areas affected by releases from it. 40 C.F.R. § 257.102(c). This includes the removal of the various components of the unit, such as all liners contaminated by CCR or leachate, and the removal and decontamination of any underlying and surrounding soils that have been affected by releases of CCR or leachate. *Id.* See 80 FR 21412. EPA provided a detailed explanation of the activities currently required to meet this standard under the existing regulations in a 2020 preamble. See 85 FR 12456. The 2020 proposal would allow a facility to complete groundwater corrective action during a postclosure period, provided all other removal and decontamination activities were completed, and therefore precisely identified which

activities needed to be completed during the closure and postclosure periods. EPA expressly stated that it is not proposing revisions to the current closure standard but is proposing to present the current closure standard in a slightly revised format to accommodate the proposed action.

“Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals: A Holistic Approach to Closure Part B: Alternate Demonstration for Unlined Surface

Impoundments; Implementation of Closure,” 85 FR 12456 (March 3, 2020) (the “Part B Proposed Rule”):

Removal and decontamination activities. These activities include removing or decontaminating all CCR and CCR residues, containment system components, contaminated subsoils, contaminated groundwater, and CCR unit structures and ancillary equipment. To qualify for the new closure by CCR removal option, EPA is proposing that owners and operators would need to complete all removal and decontamination activities, except for groundwater corrective action, which would be completed under the postclosure care provisions at § 257.104. To demonstrate that all CCR has been removed from the unit, the owner or operator would need to remove the entire contents of the CCR unit, including all CCR and any CCR residues. In addition, any containment system components such as a bottom liner, contaminated subsoils, and unit structures and equipment (e.g., concrete outlet structures and ancillary piping) would have to be removed prior to closure of the unit. Finally, any areas affected by releases from the CCR unit must have been removed (e.g., impacted soils beneath the bottom liner system).

(85 FR 12469-70)

MWG plans to close the WAP by removing all CCR and the protective granular fill layer over the existing liner as well as decontaminating all areas affected by releases from the WAP.^{18,19} During the review of compliance documentation, EPA found evidence that CCR was used as fill in the berm construction.²⁰ EPA did not find any documentation that MWG plans to remove the CCR within the WAP berms, which would be required to meet the closure by

¹⁸ Waukegan Demonstration Update, March 1, 2022, PDF page 7.

¹⁹ January 2022 Waukegan WAP Closure Plan.

²⁰ October 2016 Waukegan EAP and WAP History of Construction.

removal standard if the berms were constructed of CCR. MWG provided insufficient information for EPA to determine that MWG is planning to take sufficient actions to meet the closure by removal standard. Nor could EPA conclude that MWG could implement the necessary measures before its requested deadline as the removal of CCR within the WAP berms was not discussed in the Demonstration workplan. Therefore, EPA is proposing to conclude that MWG's closure plan for the WAP fails to adequately set out how MWG will meet the closure by removal standard. 40 C.F.R. § 257.102(b) and (c).

The October 2016 History of Construction for the EAP and WAP summarized how the ponds were built in 1977. During construction, an existing berm was widened and raised with fill (containing CCR) to surround the ponds. Additional fill was placed along the downstream slopes to provide structure for vehicular traffic and pipes. The original construction drawings show that fill materials consisted of "boiler bottom slag of acceptable fly ash content to the extent the material is readily available."^{21,22} Groundwater monitoring wells MW-01 through MW-05 and MW-16 were installed within the berms surrounding the ponds.²³ Boring logs for these wells show that "coal," "black cinders," and "ash" range from 11 to 20 feet thick, further demonstrating that the berms contain CCR.²⁴ This leaves EPA to conclude that CCR exists within the berms, which are an integral part of the WAP and therefore part of the CCR unit, and must be included in the closure. To meet the removal standard, MWG is required to remove the

²¹ October 2016 Waukegan EAP and WAP History of Construction, Drawing 5082-C-5007, PDF page 15.

²² Demonstration, Appendix C.2, PDF page 92.

²³ Demonstration, Appendix C.2, Figure C.2-1, PDF page 95.

²⁴ Waukegan Boring Logs.

CCR in the berms as all CCR and CCR residues must be removed or decontaminated. 40 C.F.R. § 257.102(c).

It appears that MWG may not intend to remove the berms based on its belief that CCR used in the berms is exempt from this requirement as a “beneficial use.” In the 2018 Annual Groundwater Monitoring and Corrective Action (GWMCA) Report, MWG stated that a mixture of fill and “beneficially re-used coal combustion by-product” were likely used for berm construction.²⁵ But whether or not the use in the berms is considered a beneficial use of CCR—and EPA is proposing to determine that MWG has failed to demonstrate that it meets the definition of a beneficial use—the CCR used in the berms is not exempt from the requirements in § 257.102(c). The beneficial use exemption describes activities that, because they are not considered to be disposal, do not create regulated units. The provision does not exempt a clearly regulated unit—which the WAP is—from compliance with all applicable regulatory obligations.

Further, as noted, EPA is proposing to determine that MWG has failed to demonstrate that it meets the definition of a beneficial use in 40 C.F.R. § 257.53, which specifies that

Beneficial use means the CCR meet all of the following conditions: (1) The CCR must provide a functional benefit; (2) The CCR must substitute for the use of a virgin material, conserving natural resources that would otherwise need to be obtained through practices, such as extraction; (3) The use of the CCR must meet relevant product specifications, regulatory standards or design standards when available, and when such standards are not available, the CCR is not used in excess quantities; and (4) When unencapsulated use of CCR involving placement on the land of 12,400 tons or more in non-roadway applications, the user must demonstrate and keep records, and provide such documentation upon request, that environmental releases to groundwater, surface water, soil and air are comparable to or lower than those from analogous products made without CCR, or that environmental releases to groundwater, surface water, soil and air will be at or below relevant regulatory and health-based benchmarks for human and ecological receptors during use.

²⁵ 2018 Waukegan Annual GWMCA Report, Appendix B, PDF page 105.

MWG failed to provide any information to support its conclusion in the 2018 GWMCA Report that “beneficially re-used coal combustion by-product” was used for berm construction. The CCR in the berm is unencapsulated as it is not bound into a solid matrix that minimizes their mobilization into the surrounding environment. See, 40 C.F.R. § 257.53 (definition of “encapsulated beneficial use”). To estimate the amount of unencapsulated CCR in the berms, EPA utilized information in the October 2016 Structural Stability and Factor of Safety Assessment, the 2016 History of Construction, and the Demonstration. MWG reports that the finger berms that run through the center of each pond extend 715 feet and that the dimensions of the ponds are 470 feet by 975 feet, for the WAP, and 470 feet by 1,030 feet for the EAP.²⁶ EPA estimated a perimeter berm length of 6,290 feet. The berms are approximately 80 feet wide,²⁷ which includes a minimum crest width of 12 feet²⁸ and 20 feet high.²⁹ EPA estimates the volume of unencapsulated CCR is 214,326 cubic yards or 278,624 tons,³⁰ which is greater than the 12,400 tons set in the regulations. Unencapsulated uses of CCR must comply with all four beneficial use criteria as they address environmental and human health concerns, in particular the O/O must demonstrate that environmental releases to groundwater, surface water, soil, and air are comparable to or lower than those from analogous products made without CCR, or that environmental releases to groundwater, surface water, soil, and air will be at or below relevant regulatory and health-based benchmarks for human and ecological receptors during use. *See* 40 CFR § 257.53; 2015 CCR Rule preamble at 80 FR 21349-51. EPA did not find any such

²⁶ October 2016 Waukegan EAP and WAP Structural Stability and Factor of Safety Assessment, PDF page 1.

²⁷ Demonstration, Drawing WKG-CSK-103, PDF page 83.

²⁸ October 2016 Waukegan EAP and WAP History of Construction, PDF page 4.

²⁹ Demonstration, Drawing WKG-CSK-103, PDF page 83.

³⁰ EPA is assuming 1 cubic yard of CCR = 1.35 tons.

demonstration for Waukegan. Any use that fails to comply with all the relevant criteria will be considered to be disposal of CCR, subject to all of the requirements in the disposal regulations.

Id. EPA is proposing to conclude that MWG has failed to demonstrate that this use of CCR meets the definition of beneficial use and must be removed to meet the closure removal standard. 40 C.F.R. § 257.102(c).

EPA is proposing to determine that MWG's approach to closure as set forth in the closure plan will not meet the closure by removal standard under the regulations. 40 C.F.R. § 257.102(c). Furthermore, MWG failed to consider the WAP's closure and its role in the selected alternative capacity in the Demonstration workplan. The LVWP is not a feasible alternative capacity as the removal of the berms would prevent it from structurally holding non-CCR wastestreams.

2. *Groundwater Monitoring Compliance*

As stated in Section II.A, the regulations require development of a groundwater monitoring network that will characterize the background levels of constituents in the uppermost aquifer upgradient of a CCR unit. This is so those levels can be compared with the constituent levels downgradient of the CCR unit after the groundwater has flowed beneath it. *See* 2015 CCR Rule preamble at 80 FR 21302, 21399-400. The objective of this groundwater monitoring system is to characterize groundwater to determine whether it has been contaminated by the CCR unit being monitored. Prompt contaminant detection is important in order for corrective measures to be developed to stop migration of contaminants as soon as possible.

To ensure detection of a release, the regulations establish a general performance standard that all groundwater monitoring systems must meet: all groundwater monitoring systems must consist of a sufficient number of appropriately located wells that will yield groundwater samples in the uppermost aquifer that represent the quality of the background groundwater and the quality

of groundwater passing the downgradient waste boundary, monitoring all potential contaminant pathways. 40 C.F.R. §§ 257.91(a)(1) and (2). Because hydrogeologic conditions vary so widely from one site to another, the regulations do not prescribe the exact number, location, and depth of monitoring wells needed to achieve the general performance standard. Rather the regulations require installation of a minimum of one upgradient and three downgradient wells. They further require any additional monitoring wells necessary to achieve the general performance standard described immediately above. *Id.* The number, spacing, and depths of the monitoring wells must be determined based on a thorough characterization of the site, including a number of specifically identified factors relating to the hydrogeology of the site (e.g., aquifer thickness, groundwater flow rates and direction). 40 C.F.R. § 257.91(b). Groundwater elevation measurements must be obtained around the unit(s) at sampling events over time to characterize groundwater flow direction at those times and to identify seasonal and temporal fluctuations. Further, any facility that determines the regulatory minimum number of wells is adequate to meet the performance standard must document the factual basis supporting that determination. 40 C.F.R. § 257.91(f). In essence, the regulation establishes a presumption that the minimum of one upgradient and three downgradient wells is not sufficient, and it requires the facility to rebut the presumption in order to install only this minimum. 80 FR 21399.

In addition, placement of the monitoring wells is critical to proper characterization of the groundwater, but even a sufficient number of properly placed wells will not provide adequate characterization if the sampling and analysis of data are not properly conducted. The regulations require facilities to submit several groundwater monitoring compliance documents as part of their demonstration so that EPA can thoroughly evaluate the groundwater monitoring network and the site hydrogeology for every CCR unit at the facility. 40 C.F.R. §§

257.103(f)(1)(iv)(B)(2), (3) and (4). EPA evaluated the documentation MWG provided in the Demonstration and reviewed the January 2017 through 2021 Annual GWMCA Reports. The Demonstration provided information for the groundwater monitoring system for the EAP and WAP. EPA is proposing to determine that the groundwater monitoring system is inadequate for multiple reasons set forth below, and, therefore, does not adequately demonstrate compliance with the regulations.

The EAP and WAP share a groundwater monitoring system, known as a multiunit groundwater monitoring system, and, as such, any issues with this system apply to both surface impoundments. The following issues are described more fully below. First, EPA believes there are deficiencies in the characterization of groundwater flow. 40 C.F.R. § 257.91(b)(1). Second, EPA identified unmonitored portions of the downgradient boundary. 40 C.F.R. § 257.91(a)(2). Third, two groundwater monitoring wells do not accurately represent groundwater from the uppermost aquifer. 40 C.F.R. §§ 257.91(a)(1) and (2). Fourth, the alternate source demonstrations (ASDs) for the ponds are insufficient and do not meet the requirements of 40 C.F.R. § 257.95(g)(3). Fifth, it appears that MWG used intrawell and interwell comparisons in their statistical analysis without providing sufficient justification or appropriate background data. 40 C.F.R. §§ 257.91(a)(1) and 257.93(f)(6).

(a) Overview of Hydrogeologic Conditions, Design of Monitoring Network, and Statistical Analyses

The uppermost aquifer beneath the WAP and EAP is an unconfined fine to medium sand with localized gravelly seams. The ponds are approximately 1,000 feet west of Lake Michigan and groundwater flows generally in the east direction toward the lake. The groundwater well monitoring network is a multiunit system that covers both ponds and consists of five

downgradient monitoring wells, MW-01 through MW-04, and MW-16, and three background wells MW-09, MW-11, MW-14.³¹

In the 2017 Statistical Approach for Groundwater Data Evaluation, MWG discusses the statistical approach, which is summarized in the following sentences. The prediction interval procedure will be used and interwell comparisons are conducted between a statistical value for background (i.e., prediction limit for each Appendix III and Appendix IV constituent) and downgradient data. A minimum of eight rounds of groundwater data was collected from each groundwater monitoring well to meet the requirements in 40 C.F.R. 257.94(b). Statistical outliers will only be removed from the background dataset if they can be traced to other than natural causes. If spatial variation is determined to be natural, an intrawell data evaluation approach may be applied to upgradient and downgradient wells. In the 2018 Annual GWMCA Report, MWG stated that the downgradient intrawell prediction limits were established for pH, boron, and sulfate parameters as the ASD determined the ponds were not the source of the statistically significant increases (SSIs). MWG stated that for these parameters in downgradient wells, a concentration above both interwell and intrawell prediction limits would be considered a potential SSI.³² In the 2019 Annual GWMCA Report, MWG applied the same process to calcium and total dissolved solids (TDS) based on the results of the ASD. In the 2020 Annual GWMCA Report, SSIs for boron, calcium, sulfate, pH, and TDS were found and the previous ASDs were referenced. In the 2021 Annual GWMCA Report, SSIs for boron, sulfate, pH, and

³¹ Demonstration, Appendix C.2, Figure C.2-1, PDF page 95.

³² 2018 Waukegan Annual GWMCA Report, PDF page 5.

TDS were found and the previous ASDs were referenced, as such, the ponds remain in detection monitoring.

(b) Proposed Finding That Characterization of Groundwater Flow Is Inadequate

CCR groundwater monitoring networks are required to be designed based on site-specific, technical information that must include thorough characterization of groundwater flow direction, including seasonal fluctuations. 40 § C.F.R. 257.91(b)(1). Characterizing the direction of groundwater flow is vital as it shows where groundwater below the CCR units flows, both from and to. It thus allows the facility to identify an upgradient to downgradient flow direction (where one exists). This characterization is generally accomplished by measuring the elevation at which groundwater is encountered below the surface at multiple locations in the area to be characterized and because groundwater flows from higher elevations to lower elevations, this information is used to determine the direction of groundwater flow. This information further supports decisions about where to place monitoring wells to accurately characterize groundwater quality upgradient and downgradient of a CCR unit. 40 C.F.R. §§ 257.91(a)(1) and (2). EPA is proposing to determine that there are an insufficient number of groundwater elevation data points surrounding the EAP and WAP to support conclusions about groundwater flow direction, and therefore, the placement of groundwater monitoring wells. Because of this, EPA is proposing to conclude that MWG has not adequately demonstrated the groundwater monitoring system meets the performance standards in 40 C.F.R. §§ 257.91(a) and (b).

EPA considers the information provided in the Demonstration and in the documents available on MWG's CCR website to be insufficient to determine whether the number and lateral spacing of monitoring wells around the impoundments are adequately supported by site-specific

technical information. In the 2017 through 2021 Annual GWMCA Reports, MWG states groundwater flow in the vicinity of the ponds is consistently to the east and southeast. A helpful tool to visualize groundwater flow direction is a potentiometric surface map, which depicts monitored groundwater elevations. In a potentiometric map, locations with the same groundwater elevation are connected by a contour line, and arrows are drawn perpendicularly from contours at higher elevations toward those at lower elevations to indicate groundwater flow direction across the site. The Annual GWMCA Reports' potentiometric surface maps reflect the most recent groundwater elevation data and groundwater flow direction. For the reasons set forth in the paragraphs immediately below, EPA proposes to conclude that there are an insufficient number of groundwater elevation data points to support characterization of groundwater flow direction and well placement.

For example, there are no groundwater elevation data points along the northern boundaries, between monitoring wells MW-09 and MW-01, to support that groundwater flows to the east in this area, as indicated by the groundwater flow lines.³³ The distance between MW-09 and MW-01 on the northern side of the ponds is over 1,000 feet. In addition, only one groundwater well, MW-05, is present along the 1,000 feet of the western and southwestern boundary of the WAP to provide groundwater elevation data.³⁴

Potentiometric surface maps in the 2017 through 2022 Annual GWMCA Reports indicate that there may be groundwater mounding beneath the ponds. First, the potentiometric surface maps often mimic the east and southern boundaries of the EAP indicating radial flow.³⁵ Second,

³³ 2017 through 2021 Waukegan Annual GWMCA Reports, Figure 2.

³⁴ MW-05 is not a part of the ponds' groundwater monitoring network and is only used in contour determination. *See* 2017 through 2021 Waukegan Annual GWMCA Reports, Figure 2.

³⁵ 2021 Waukegan Annual GWMCA Report, Figures 2–4.

groundwater elevations measured at MW-04 are consistently higher than those at MW-16. For the 19 rounds of groundwater elevation measurements taken between 2015 and 2021, 14 rounds showed higher elevations in MW-04 than in MW-16.³⁶ This indicates that groundwater generally flows southwest from MW-04 to MW-16. This is inconsistent with the regional pattern of west-to-east groundwater flow towards Lake Michigan, but is consistent with radial groundwater flow associated with groundwater mounding beneath the ponds. This indicates leakage from the ponds into the underlying, uppermost aquifer. In addition, such groundwater mounding and radial flow from the ponds would indicate that waste boundaries along the north, west, and southwest of the ponds are downgradient. Third, one or more SSIs have been detected in one or more downgradient wells (i.e., MW-01 through MW-04, MW-16) in every monitoring event since statistical comparisons began in 2017. These SSIs are consistent with leakage from the ponds, further supporting the likelihood of groundwater mounding.

EPA is proposing to determine that MWG failed to adequately characterize groundwater flow conditions based upon site-specific technical information, as required by 40 C.F.R. § 257.91(b)(1). Consequently, EPA is proposing to determine that MWG has not demonstrated the groundwater monitoring system accurately represents the quality of groundwater passing the downgradient boundary in the uppermost aquifer and all potential contaminant pathways are monitored. 40 C.F.R. § 257.91(a)(2).

³⁶ 2017 through 2021 Waukegan Annual GWMCA Reports, Table 1.

(c) Proposed Finding That Groundwater Monitoring System Fails to Meet the Performance Standard

The regulations require that the groundwater monitoring system has wells that are installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer. 40 C.F.R. § 257.91(a). As discussed in Section III.E.2, the uppermost aquifer is identified as an unconfined sand unit. EPA is proposing to determine that the groundwater monitoring system does not meet the performance standard as wells MW-09 and MW-16 are not properly screened within the uppermost aquifer. 40 C.F.R. § 257.91(a).

MWG relied upon three wells to characterize background groundwater quality, MW-09, MW-11, and MW-14. MWG does not have boring logs for the wells MW-11 and MW-14 as these wells were installed by another entity.³⁷ The boring logs for MW-09 and MW-16 show that they are screened in approximately four feet of fill (i.e., black slag or cinders), which means that these wells will not yield groundwater samples that accurately represent the uppermost aquifer.³⁸ Therefore, these wells fail to meet the performance standard. 40 C.F.R. § 257.91(a). Of further concern is the use of MW-09 to conduct the statistical analyses required by 40 C.F.R. § 257.93(h). This provision requires the O/O to determine whether there has been an SSI above background levels for each constituent in 40 C.F.R. Part 257, Appendix III, by comparing downgradient concentrations to those in the background wells. Detection of concentrations of constituents at SSIs serves as evidence that a CCR unit is leaking. Use of monitoring data from improperly screened contaminated wells in the statistical background dataset for the ponds may have inflated the statistical background limits used for these comparisons. As a consequence,

³⁷ Waukegan Demonstration Supplemental Information Letter, March 18, 2021.

³⁸ Demonstration, Appendix C.2, Attachment C.2-1, PDF pg. 106-107.

concentrations detected in the downgradient wells may be compared to an inaccurately high background level, potentially masking detection of SSIs.

EPA is proposing to determine that the groundwater monitoring system does not meet the performance standard as wells MW-09 and MW-16 are not properly screened to meet the requirements for monitoring the uppermost aquifer. 40 C.F.R. § 257.91(a).

(d) Proposed Finding That the ASDs for the EAP and WAP Are Insufficient

EPA is proposing to find that the ASDs for the ponds are not sufficiently supported by site-specific facts and analytical data. If the O/O of a facility determines that there was an SSI over background levels of one or more 40 CFR Part 257 Appendix III parameters at a downgradient waste boundary monitoring well, they may complete an ASD showing that a source other than the unit was the cause. 40 C.F.R. § 257.94(e)(2). If a successful ASD for an SSI is not completed within 90 days, an assessment monitoring program must be initiated. Similarly, if a statistically significant level (SSL) over a groundwater protection standard is detected, the O/O may complete an ASD. 40 C.F.R. § 257.95(g)(3)(ii). A successful ASD will demonstrate that a specified source other than the CCR unit is responsible for the SSI or SSL. To rebut the presumption that the site-specific monitoring data and analysis that resulted in an SSI or SSL indicates the CCR unit is the source of the release, an ASD requires conclusions that are supported by additional site-specific facts and analytical data. Merely speculative or theoretical bases for the conclusions are insufficient.

2018 ASD Lines of Evidence

In the 2018 Annual GWMCA Report, MWG reported detection of SSIs for Appendix III parameters boron, pH, and sulfate in downgradient wells MW-01, MW-02, MW-03, MW-04, and MW-16. An ASD was completed that claimed sources other than the regulated units were

the cause of the SSIs.³⁹ To support this claim, MWG collected pond water from the WAP and a series of ash samples from both ponds. The ash samples were thoroughly mixed to form a single, composite sample for each pond. All samples were tested using the Leaching Environmental Assessment Framework (LEAF) test method 1313.⁴⁰ Under this method, the samples undergo leaching over a range of eight pH values and the pH of the ash itself (e.g., 9.7). This leaching characterization method is designed to evaluate the partitioning of constituents between liquid and solid phases, called liquid-solid partitioning (LSP), at near equilibrium conditions over a wide range of pH values.⁴¹ MWG analyzed the leachate from each pH value for Appendix III parameters. The results from the LEAF test and data from the September 2017 sampling event are plotted in Figures 2 through 7 of the ASD.

The following paragraphs are the lines of evidence MWG used to claim the ponds were not the source of the SSIs. Based on the LEAF test results, MWG concluded that boron and sulfate concentrations are a function of pH with concentrations decreasing from a pH of 2 to 9 and then slightly increasing through a pH of 13. First, MWG states that boron concentrations in the downgradient wells are lower than the boron concentrations associated with the pH of the ash in the LEAF tests (natural pH) and thus signifies that the ponds are the not source. Similarly, MWG states that since sulfate concentrations in the downgradient wells are higher than the sulfate concentrations associated with the ash natural pH concentrations, this signifies that the ponds are the not source.

³⁹ 2018 Waukegan Annual GWMCA Report, Appendix B, PDF page 100.

⁴⁰ U.S. EPA, May 2019, LEAF How-To Guide, PDF page 31.

⁴¹ U.S. EPA, May 2019, LEAF How-To Guide, PDF page 31.

Second, MWG calculated the ratio of boron to sulfate for the LEAF test data, natural pH, and downgradient wells. It claimed that if the ratio from downgradient wells falls within the LEAF or natural pH ratio ranges, then the source is the ponds. The range of boron to sulfate ratios in the downgradient wells were 0.008 – 0.016, which fall outside the LEAF ratios of 0.027 – 0.035 and natural pH ratios of 0.015 – 0.05. MWG concludes that all ratios, except MW-02, are below the boron to sulfate ratio range and, therefore, the SSIs are due to a source other than the ponds.⁴²

Third, MWG modeled the advection-dispersion transport of sulfate from well MW-05 to the downgradient wells. Well MW-05 is not part of the groundwater monitoring system. It is located along the western boundary of the WAP and has higher sulfate concentrations than the downgradient wells.⁴³ The modeled downgradient sulfate concentration range was 29.2 mg/L – 51.7 mg/L, which is lower than the actual field results for the downgradient well range of 260 mg/L – 480 mg/L. MWG then added the ash natural pH sulfate concentration to the model, which resulted in a slight increase in sulfate to a range of 33.6 mg/L – 66.1 mg/L. MWG conducted this same process for boron concentrations with similar results; and concluded that the source of the boron SSIs are not the ponds. MWG claims that groundwater immediately upgradient in well MW-05 has higher sulfate and boron levels than the downgradient wells, which suggests another source outside of the ponds.

For the pH SSIs, MWG states that pH in MW-01 and MW-02 has shown a cyclical upward and downward trend since 2010, and a similar trend would be expected to be found in

⁴² 2018 Waukegan Annual GWMCA Report, Appendix B, PDF page 105.

⁴³ 2018 Waukegan Annual GWMCA Report, Appendix B, Figure 1.

the boron concentrations as the LEAF results indicate a relationship between pH and boron.⁴⁴ MWG claims that the ponds are not the source because no such trend is found in its boron concentrations. Furthermore, MWG states that the high pH levels are higher than would be expected from CCR. Based off these findings, MWG states the source is not the ponds but is instead another unidentified localized source.⁴⁵

2018 ASD Is Insufficient

EPA has identified multiple problems with the lines of evidence presented by MWG in its 2018 ASD. EPA is proposing to conclude that MWG misconstrued the results from the LEAF testing and incorrectly used these results as its main line of evidence to argue the ponds are not the source of the SSIs. As stated above, LEAF testing aims to capture the extent of leaching through LSP, which is the chemical equilibrium state that describes the distribution of a constituent between the solid phase and a contacting liquid.⁴⁶ While LEAF testing gives an estimate of the rate and extent of the release of inorganic constituents from a solid material such as CCR, there are many chemical factors that can influence the LSP of a constituent. The two parameters that are most influential for inorganic constituents are pH and the liquid-to-solid ratio (L/S).⁴⁷ MWG did not properly take either of these factors into account as it incorrectly compares concentrations from the downgradient wells to LEAF test results. Additionally, the May 2019 EPA LEAF How-To Guide (“LEAF Guide”) warns that the usefulness of LEAF testing depends on how well test results estimate environmental conditions for a specific

⁴⁴ 2018 Waukegan Annual GWMCA Report, Appendix B, Figure 8.

⁴⁵ 2018 Waukegan Annual GWMCA Report, Appendix B, PDF page 107.

⁴⁶ U.S. EPA, May 2019, LEAF How-To Guide, PDF page 25.

⁴⁷ U.S. EPA, May 2019, LEAF How-To Guide, PDF page 25.

application.⁴⁸ EPA understands this to mean that site-specific environmental conditions and analytical data must be considered. In addition to failing to take into account these considerations, EPA has identified six further reasons why the 2018 ASD is insufficient.

First, MWG failed to identify an alternate source and take samples from the source(s) to support its claims. In the 2018 ASD, MWG states that a mixture of fill and beneficially reused CCR were used in the construction of the berms – as if to suggest it could be the alternate source. To the extent that MWG's position is that part of its CCR unit – that is, the berms constructed with CCR – are the source of the contamination, then it is identifying the CCR unit as the source. The berms are an integral part of the unit. In the 2018 ASD's concluding statements, MWG also states that SSIs are from other potential historical sources. However, MWG failed to be more specific beyond these conclusionary and otherwise unsupported statements in the 2018 ASD. Nonetheless, it suggests that the other potential historical sources are CCR, and therefore, it is unclear how MWG would differentiate between CCR in the historical source versus the ponds using LEAF test results. Even had MWG properly identified an alternate source, the ASD is inadequate for numerous reasons covered below.

Second, MWG compared the boron and sulfate concentrations in the downgradient wells to the concentrations leached from the ash at natural pH concentrations. The pH of downgradient wells ranges from 7.04 to 10.45 while the natural pH of the ash is 9.7. It is unclear to EPA how comparing sulfate and boron concentrations in the downgradient wells with varying pH values to the concentrations at the solitary natural pH value (i.e., 9.7) suggests that the ponds are not the source. As MWG claims, the LEAF test results show that boron and sulfate concentrations are a

⁴⁸ U.S. EPA, May 2019, LEAF How-To Guide, PDF page 19.

function of pH, and the LEAF Guide instructs that pH is one of the most influential chemical factors. It would be more appropriate to compare concentrations at the same pH as encountered in downgradient wells, which MWG does not do, thus undermining multiple lines of evidence.

Third, MWG did not consider the L/S ratio, that is, the amount of CCR in contact with groundwater. In the lab, the L/S ratio is controlled, while the L/S ratio in the field can vary greatly. This can significantly affect the concentrations of sulfate and boron measured in the downgradient wells at Waukegan. MWG failed to develop a basis for comparing the LEAF test results to in situ ash in the ponds. MWG did not quantify the L/S ratio of in situ ash in the ponds nor estimate the error in comparing the LEAF L/S ratio to the in situ ash L/S ratio. Therefore, comparing the September 2017 field concentrations to the LEAF results or the natural pH is not supportive as it does not consider the L/S.

Fourth, the LEAF Guide instructs that site-specific environmental conditions must be considered as they may influence leaching.⁴⁹ For example, the mineralogy of the soil and reduction/oxidation conditions are site-specific environmental conditions. To account for some conditions, the LEAF Guide recommends combining Methods 1313 with 1314, as well as conducting geochemical speciation modeling.⁵⁰ MWG has done neither of these and it failed to consider site-specific conditions. EPA's interpretation of Waukegan's LEAF results indicates that there are other site-specific environmental conditions that are influencing the sulfate and boron concentrations and pH at the site.

Fifth, the advection-dispersion transport models for boron and sulfate are inaccurate and MWG improperly uses the models' results to claim that the ponds are not the source. In general,

⁴⁹ U.S. EPA, May 2019, LEAF How-To Guide, PDF page 29.

⁵⁰ U.S. EPA, May 2019, LEAF How-To Guide, PDF page 41.

groundwater models should reliably predict the rate and direction of groundwater flow and contaminant transport.⁵¹ An essential component of accurate groundwater models is the input of available field data, such as field (i.e., downgradient well) concentrations. Furthermore, models should be calibrated by minimizing the difference between observed (i.e., field) and predicted concentrations.⁵² If the predicted concentrations do not match those observed, as is the case here (e.g., predicted sulfate concentrations are nearly an order of magnitude lower than field concentrations), this indicates the models are inaccurate and need further modification. Additionally, the groundwater model used is a “two-dimensional analytical model noted above for simple advection-dispersion based constituent transport”⁵³ and thus missing geochemical modeling considerations (e.g., gypsum saturation indices) that may play an important role in a dynamic setting like Waukegan. EPA disagrees with MWG’s conclusion that the models’ results suggest the ponds are not the source.

Sixth, EPA disagrees with MWG’s claim that due to the lack of a cyclical trend in boron at MW-01 and MW-02, the source of the pH SSIs are not the ponds but rather another unidentified localized source. As stated above, in conjunction with the actual release from the pond, there can be site-specific environmental conditions such as the mineralogy of the soils that can influence pH.⁵⁴ In the 2018 ASD, MWG failed to identify such site-specific conditions and did not identify an alternate source.

⁵¹ April 1992, EPA Ground Water Issue: Fundamentals of Ground-Water Modeling, PDF page 1.

⁵² April 1992, EPA Ground Water Issue: Fundamentals of Ground-Water Modeling, PDF pages 7-8.

⁵³ 2018 Waukegan GWMCA Report, Appendix A, PDF page 106.

⁵⁴ <https://www.epa.gov/caddis-vol2/ph>.

EPA found similar problems for the 2019 ASD as MWG used the same LEAF test results but for calcium and TDS SSIs. Specifically, MWG failed to identify an alternate source for calcium and TDS. For the same reasons outlined above, EPA is proposing to find the 2019 ASD is insufficient, as are the references to it in the 2020 and 2021 Annual GWMCA Reports.^{55,56} Because of the lack of site-specific evidence and inconclusive analyses provided, EPA is proposing to determine that the ASDs are insufficient and do not meet the requirements of 40 C.F.R. § 257.94(e)(2).

(e) Proposed Findings of Improper Statistical Comparisons at the EAP and WAP

EPA is proposing to find that MWG is conducting improper statistical comparisons for the ponds. The CCR regulations establish requirements for *one* statistical method for each specified constituent. 40 C.F.R. § 257.93(f). Furthermore, the regulations do not mention interwell or intrawell comparisons specifically; however, they indicate a strong preference for interwell comparison depending on background groundwater characterization.⁵⁷ Intrawell comparison is appropriate if it is demonstrated that the data were gathered when the well was known to be uncontaminated by the CCR unit or prior to placement of CCR in the unit.⁵⁸ 40 C.F.R. § 257.91(a)(1). First, MWG is improperly applying both intrawell and interwell comparisons for the same constituent at the ponds. Second, downgradient wells at this facility are inappropriate for intrawell comparisons. Third, MWG failed to exclude statistical outliers from background, resulting in a statistical limit that is not representative of background groundwater

⁵⁵ 2020 Waukegan Annual GWMCA Report, PDF page 3.

⁵⁶ 2021 Waukegan Annual GWMCA Report, PDF page 3.

⁵⁷ See Section III.E.2.f of the Proposed Conditional Approval of Alternative Closure Deadline for A.B. Brown Generating Station.

⁵⁸ March 2009, EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Unified Guidance (“Unified Guidance”), Section 17.3, PDF pages 408 - 410.

quality at the facility. Due to all these issues, MWG failed to properly detect SSIs at the EAP and WAP.

In the 2018 Annual GWMCA report, MWG changed its data analysis approach for certain parameters to utilize both intrawell and interwell comparisons for a single well/constituent pair. MWG stated that a concentration above *both* interwell and intrawell prediction limits would be considered a potential SSI. This continues to be MWG's approach in the 2019 through 2021 Annual GWMCA Reports. The regulations state that one statistical method must be used in evaluating groundwater monitoring data for each specified constituent and, therefore, an SSI or SSL should be determined from one statistical method, not both. 40 C.F.R. § 257.93(f). Additionally, 40 C.F.R. § 257.93(g)(4) requires that the prediction interval procedure "...shall be such that this approach is at least as effective as any other approach in this section for evaluating groundwater data." A procedure that requires that compliance results exceed the *higher* of the intrawell and interwell prediction limits would result in using the *less* effective prediction limit, not the more effective prediction limit and thus would be a violation of the rule.

As stated above, intrawell comparisons are appropriate if the well is known to be uncontaminated by the CCR unit or prior to placement of CCR in the unit, which is not the case at Waukegan. MWG used downgradient wells (i.e., MW-01 through MW-04 and MW-16) for intrawell comparison that were installed after waste placement. Using these wells for intrawell analysis is inappropriate as they do not accurately represent background groundwater quality.⁵⁹

⁵⁹ Unified Guidance, Section 17.3, PDF page 409; and Section 18.1, page 427.

Additionally, MWG 's policy of only removing statistical outliers if they “can be traced to other than natural causes” is not consistent with the requirement in 40 C.F.R. § 257.93(a) for background data to “provide an accurate representation of groundwater quality at the background” and also not consistent with the Unified Guidance.⁶⁰ While the Unified Guidance does warn against the “*automated*” removal of statistical outliers, the Unified Guidance also recommends a balanced approach to dealing with statistical outliers that considers the data distribution and the overall effect of retention vs. removal of the outlier, stating:

“...it may be advisable at times to remove high-magnitude outliers in background even if the reasons for these apparently extreme observations are not known. The overall impact of removal will tend to improve the power of prediction limits and control charts, and thus result in a more environmentally protective program.”

and,

“If an outlier value with much higher concentration than other background observations is not removed from background prior to statistical testing,” and “if the maximum is an outlier not representative of the background population, few truly contaminated compliance wells are likely to be identified by such a test.”

Similarly, when statistical outliers are present in nonparametric datasets, the Unified Guidance recommends fixing the nonparametric prediction limit as the second highest (and presumably more representative) background concentration.⁶¹ For example, MWG sets the prediction limit for fluoride as 4.9 mg/L,⁶² however, the second highest fluoride result of 0.30 mg/L concentration obtained at MW-14 on May 18, 2017 is more than a full order of magnitude less than the 4.9 mg/L result and a better fit with the remaining distribution, and would be the appropriate prediction limit.⁶³ The use of the statistical outlier (i.e., 4.9 mg/L) for fluoride as the

⁶⁰ Unified Guidance, Section 5.2.3, PDF page 78.

⁶¹ Unified Guidance, Section 18.3, PDF page 442.

⁶² 2017 Waukegan Annual GWMCA Report, Table 4, PDF pages 18 – 19.

⁶³ 2017 Waukegan Annual GWMCA Report, Table 3, PDF page 24.

nonparametric prediction limit prevents the detection of SSIs as seen in well MW-02 wherein fluoride concentrations exceed 0.30 mg/L every year since groundwater monitoring began.⁶⁴

EPA is proposing to find that MWG failed to conduct proper statistical comparisons for the EAP and WAP. 40 C.F.R. § 257.93(f). This prevents MWG from identifying SSIs in downgradient wells since groundwater monitoring began in 2017.

IV. EPA's Proposed Action

EPA is proposing that Waukegan must cease receipt of waste within 135 days of the date of the Agency's final decision (i.e., the date on which the decision is signed) or the date for cease receipt of waste set by 40 C.F.R. Section 257.103(f)(1)(vi)(A) and (B) (**Maximum time frames**), whichever arrives first. EPA is further proposing that, under certain circumstances described below, EPA could authorize additional time for Waukegan to continue to use the impoundments to the extent necessary to address demonstrated grid reliability issues, if any, provided that Waukegan submits a planned outage request to PJM within 15 days of the date of EPA's final decision and Waukegan provides the PJM determination disapproving the planned outage and the formal reliability assessment upon which it is based to EPA within 10 days of receiving them.

The regulations state that, when EPA denies an application for an extension, the final decision will include the facility's deadline to cease receipt of waste, but they do not provide direction on what the new deadline should be. 40 C.F.R. § 257.103(f)(3). EPA is proposing to set a new deadline for Waukegan to cease receipt of waste that would be 135 days from the date of the final decision on Waukegan's Demonstration or the date for cease receipt of waste set by 40

⁶⁴ 2017 through 2021 Waukegan Annual GWMCA Reports, Table 4.

C.F.R. Section 257.103(f)(1)(vi)(A) and (B) (**Maximum time frames**), whichever arrives first. This would provide Waukegan with the same amount of time that would have been available to the facility had EPA issued a denial immediately upon receipt of the Demonstration (i.e., from November 30, 2020, when EPA received the submission, to April 11, 2021, the regulatory deadline to cease receipt of waste). This amount of time thus puts the facility in the same place it would have been had EPA immediately acted on the Demonstration and therefore adequately accounts for any equitable reliance interest Waukegan may have had after submitting its Demonstration. Moreover, as discussed further below, this date should provide Waukegan with adequate time to coordinate with and obtain any necessary approvals from PJM for any outage of the coal-fired boiler that may be necessary. This proposed deadline for Waukegan to cease receipt of waste is the same as the proposed effective date of EPA's final decision (*see* Section VI below).

Given that this proposed deadline (135 days from the date of EPA's final decision or the maximum time frame set forth in 40 C.F.R. 257.102(f)(1)(iv)(a) and (B), whichever comes first) may be sooner than the deadline requested by MWG,⁶⁵ EPA understands that it is likely that Waukegan will temporarily need to stop producing waste (and therefore power) until alternate capacity is made to manage non-CCR wastestreams.⁶⁶ In the Demonstration, it noted that if the requested deadline were not granted, it would have to cease power production, which would reduce generation capacity in the state and reduce reliability of the electric grid. MWG provided no information or evidence to support this statement. EPA does not have independent evidence

⁶⁵ *See* time frame discussion in Section III.D of this proposal.

⁶⁶ *See* discussion of adverse effects above in Section III.B.

showing that the temporary outage of the coal-fired boiler at this facility would affect the reliability of the grid.

This facility operates as part of the PJM system, which is the largest competitive market for electric power in the United States. PJM is an RTO that is part of the Eastern Interconnection grid. PJM currently has a significant amount of excess generating capacity, and consequently, a relatively large reserve margin. A reserve margin is a measure of the system's generating capability above the amount required to meet the system's peak load.⁶⁷ PJM's target reserve margin⁶⁸ for the region is now 14.7%.⁶⁹ PJM's actual reserve margin in 2018 was more than twice that, at 32.8%; in 2019 it was 29%. The anticipated reserve margin for 2021 is projected to be almost 34%.

The significant exceedance of PJM's existing target reserve margin, combined with scheduled new capacity coming online into the market, suggests that the temporary outage at the Waukegan Generating Station would not adversely affect resource adequacy requirements. EPA also has not seen any information to indicate that an extended planned outage at the Waukegan Generating Station would trigger local reliability violations.⁷⁰ Additionally, especially with the

⁶⁷ Reserve margin is defined as the difference between total dependable capacity and annual system peak load (net internal demand) divided by annual system peak load.

⁶⁸ The target reserve margin, also known as the Installed Reserve Margin, is "the percent of aggregate generating unit capability above the forecasted peak load that is required for adherence to meet a given adequacy level." Page 52, <https://www.pjm.com/-/media/committees-groups/committees/mc/2020/20201119/20201119-cac-2-2020-installed-reserve-margin-study-results-report.ashx>.

⁶⁹ North American Electric Reliability Corporation, Summer 2021 Reliability Assessment, page 44 (where "Reference" Reserve Margin Level refers to PJM's Installed Reserve Margin), <https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC%20SRA%202021.pdf>.

⁷⁰ A local reliability violation might occur, for example, if transmission line constraints limit the amount of power that can get to an area from plants outside that area.

advance notice, there are a wide array of tools available to utilities, system operators, and state and federal regulators to address situations where the outage of a generating unit might otherwise affect local electric reliability conditions.

Nonetheless, EPA is sensitive to the importance of maintaining enough electricity generating capacity to meet the region's energy needs, including meeting specific, localized issues. EPA understands that it is possible that in some instances temporarily taking generating units (including coal-fired units) offline could have an adverse, localized impact on electric reliability (e.g., voltage support, local resource adequacy), although Waukegan has presented no evidence that such is the case with this facility.

If a generating asset were needed for local reliability requirements, the grid operator (e.g., PJM) might not approve a request for a planned outage. In such instances, the O/O of the generating unit could find themselves in the position of either operating in noncompliance with the Resource Conservation and Recovery Act (RCRA) or halting operations and thereby potentially causing adverse reliability conditions.

EPA is obligated to ensure compliance with RCRA to protect human health and the environment. Where there is a conflict between timely compliance and electric reliability, EPA intends to carefully exercise its authorities to ensure compliance with RCRA while taking into account any genuine, demonstrated risks to grid reliability identified through the process established by PJM that governs O/O requests for planned outages and/or deactivation.⁷¹

Accordingly, EPA is proposing to rely on established processes and authorities used by PJM to

⁷¹ See, e.g., PJM Manual 10: Pre-Scheduling Operations, Revision: 39, Effective Date: November 19, 2020 (Section II), available at <https://www.pjm.com/~media/documents/manuals/m10.ashx>.

determine whether a planned outage necessary to meet the new deadline would cause a demonstrated grid reliability issue.

PJM is responsible for coordinating and approving requests for planned outages of generation and transmission facilities, as necessary, for the reliable operation of the PJM RTO.⁷² In PJM, power plants are to submit a request at least 30 days in advance of a planned outage to allow PJM to evaluate whether the resource is needed to maintain grid reliability. PJM will grant the request unless it determines that the planned outage would adversely affect reliability.

If PJM approves a planned outage request, the outage may proceed and there would be no reason to expect that the outage would affect reliability. However, if PJM disapproves a planned outage, the procedure is for the PJM member to submit a new planned outage request for PJM to evaluate (with potential proposals to mitigate previously indicated reliability violations with the prior request). This process is repeated until the generating facility submits an acceptable request. The PJM member may also request PJM's assistance in scheduling a planned outage.

PJM may rely on different bases in determining whether to deny a request for a planned outage. For example, a denial may be issued because of timing considerations taking into account previously approved planned outage requests, in which case the EPA would expect the plant owner to work with PJM to plan an outage schedule that can be approved by PJM and also satisfies the plant owner's RCRA obligations, without regard to any cost implications (e.g., in meeting any contractual obligations with third parties) that may result for the plant owner under a revised proposed outage schedule.

⁷² See, PJM Manual 10: Pre-Scheduling Operations, Revision: 39, Effective Date: November 19, 2020 (Section II), available at <https://www.pjm.com/~media/documents/manuals/m10.ashx>.

Alternatively, however, in some cases, PJM might deny a request should it determine that the planned outage could not occur without triggering operational reliability violations. In such cases, the system operator might determine that the generating unit would need to remain in operation until remedies are implemented. As set forth above, Waukegan has presented no evidence that such is the case with this facility.

For the Waukegan Generating Station, EPA is proposing to rely on PJM's procedures for reviewing planned maintenance outage and similar requests. Accordingly, EPA is proposing that, if PJM approves Waukegan's planned outage request, EPA would not grant any further extension of the deadline to cease receipt of waste (i.e., the deadline would be 135 days from the date of EPA's final decision). If, however, PJM disapproves Waukegan's planned outage request based on a technical demonstration of operational reliability issues, EPA is proposing that, based on its review of that disapproval and its bases, EPA could grant a further extension (i.e., beyond 135 days from the date of EPA's final decision). EPA is further proposing that such a request could only be granted if it were supported by the results of the formal reliability assessment(s) conducted by PJM that established that the temporary outage of the boiler during the period needed to complete construction of alternative disposal capacity would have an adverse impact on reliability. In such a case EPA is proposing that, without additional notice and comment, it could authorize continued use of the impoundment for either the amount of time provided in an alternative schedule proposed by PJM or the amount of time EPA determines is needed to complete construction of alternative disposal capacity based on its review of the Demonstration, whichever is shorter. EPA is further proposing that a disapproval from PJM without a finding of technical infeasibility for demonstrated reliability concerns would not support EPA's approval of an extension of the date to cease receipt of waste because any concern about outage schedules

and their implications for plant economics could be resolved without an extension of RCRA compliance deadlines (e.g., through provision of replacement power and/or capacity; rearranging plant maintenance schedules; reconfiguration of equipment).

To obtain an extension, EPA is proposing that Waukegan must submit a request for an outage to PJM within 15 days of the date of EPA's final decision or the date for cease receipt of waste set by 40 C.F.R. Section 257.103(f)(1)(vi)(A) and (B) (**Maximum time frames**), whichever arrives first. To avoid the need for serial requests and submissions to PJM, EPA is proposing to require Waukegan to contact PJM and request assistance in scheduling the planned outage so that Waukegan and PJM can determine the shortest period of time during an overall planned outage period in which the generating unit must be online to avoid a reliability violation. EPA expects that Waukegan and PJM would plan the outage(s) and return-to-service periods—and any other needed accommodations—in ways that minimize the period of actual plant operations.

Finally, to obtain an extension from EPA, Waukegan must submit a copy of the request to PJM and the PJM determination (including the formal reliability assessment) to EPA within 10 days of receiving the response from PJM. EPA would review the request and, without further notice and comment, issue a decision.

One hundred thirty-five days should normally provide adequate time to obtain a decision from PJM. According to the PJM Manual 10 (at page 17), the normal process for obtaining approval for a planned outage is 30 days. The 135 days should also provide sufficient time to accommodate multiple requests, if necessary, to obtain approval. However, EPA solicits comment on whether 135 days from the date of the final decision provides sufficient time to accommodate the normal process of obtaining approval for a planned outage.

V. Conclusion

In conclusion, EPA is proposing to deny MWG's request for an alternative compliance date for its EAP CCR surface impoundment, located at the Waukegan Generating Station in Waukegan, Illinois. EPA is proposing to deny MWG's request for an alternative compliance deadline for the EAP because it failed to 1) consider individual wastestreams and 2) conduct a site-specific analysis for the alternative capacity selected. EPA is also proposing to deny the extension request because MWG has not demonstrated that the facility is in compliance with all the requirements of 257 subpart D, based on concerns with the groundwater monitoring at the facility and with the WAP's closure plan. EPA is proposing that the EAP cease receipt of waste and initiate closure no later than 135 days from the date of EPA's final decision or the date for cease receipt of waste set by 40 C.F.R. Section 257.103(f)(1)(vi)(A) and (B) (**Maximum time frames**), whichever arrives first.

Finally, due to the nature of the noncompliance EPA has preliminarily identified at Waukegan, EPA is proposing to issue a denial rather than a conditional approval. As discussed in greater detail in the proposed H.L. Spurlock Power Station decision, EPA is proposing that a conditional approval may be appropriate in situations where the actions necessary to bring the facility into compliance are straightforward and the facility could take the actions well before its requested deadline (or the alternative deadline that EPA has determined to be warranted). But in the case of Waukegan, the noncompliance EPA has identified involves more complicated technical issues, where the specific actions necessary to come into compliance cannot be easily identified and/or cannot be implemented quickly. Specifically, EPA cannot approve the selected alternative capacity as it would prevent the WAP from meeting the closure by removal standard

in 40 C.F.R. 257.102(c) moreover, since the disposal capacity is denied, the EPA has no authority to grant approval.

VI. Effective Date

EPA is proposing to establish an effective date for the final decision on Waukegan's Demonstration of 135 days after the date of the final decision (i.e., the date that the final decision is signed) or the date for cease receipt of waste set by 40 C.F.R. Section 257.103(f)(1)(vi)(A) and (B) (**Maximum time frames**), whichever arrives first. EPA is proposing to align the effective date with the new deadline that EPA is proposing to establish for Waukegan to cease receipt of waste. EPA is doing so for all of the reasons discussed as the basis for proposing to establish the new cease receipt of waste discussed in Section IV of this document.

Date: 06/20/2023

A handwritten signature in black ink, appearing to read "Barry N. Breen", is written over a light gray rectangular background.

Barry N. Breen
Acting Assistant Administrator