

MWVG

Midwest Generation, LLC

Powerton Generating Station

Ash Surge Basin Retrofit Plan

Revision 0

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55 East Monroe Street
Chicago, IL 60603-5780 USA
312-269-2000
www.sargentlundy.com



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1.0 PURPOSE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)

Federal CCR Rule Reference: 40 CFR 257.102(k)(2)

1.1 PURPOSE

Midwest Generation, LLC (MWG) plans to retrofit the Ash Surge Basin at the Powerton Generating Station (“Powerton” or “Station”) in Pekin, Illinois with a new composite liner system and a new leachate collection and removal system. The Ash Surge Basin is an existing coal combustion residual (CCR) surface impoundment that the Station uses as a settling pond for bottom ash transport water discharged from the Station’s dewatering bins (which initially treat the Station’s CCR sluice water) and for other process waste streams related to electric power-generating operations. The basin is currently lined with a 60-mil high-density polyethylene (HDPE) geomembrane liner, has a surface area of approximately 8.4 acres, and has a storage capacity of approximately 162,000 cubic yards.

As a CCR surface impoundment, the Ash Surge Basin is regulated by both the Illinois Pollution Control Board’s “Standards for the Disposal of Coal Combustion Residuals in CCR Surface Impoundments,” which are codified in Title 35, Part 845 to the Illinois Administrative Code (35 Ill. Adm. Code 845), and the U.S. Environmental Protection Agency’s (EPA) “Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments,” which are codified in 40 CFR Part 257 Subpart D. These state and federal CCR regulations are referred to herein as the Illinois CCR Rule and the Federal CCR Rule, respectively. Pursuant to 35 Ill. Adm. Code 845.770(c) and 40 CFR 257.102(k)(2), this document provides MWG’s written retrofit plan for the Ash Surge Basin.

1.2 SCOPE

Per the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act, the Ash Surge Basin will continue to be subject to both the Illinois and Federal CCR Rules until the U.S. EPA approves the Illinois EPA’s CCR permit program. The Illinois EPA has yet to publish a timeline for submitting its proposed CCR permit program to the U.S. EPA for approval, and so this written retrofit plan has been prepared pursuant to both sets of regulations.

2.0 RETROFIT PLAN NARRATIVE DESCRIPTION

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(1)(A)

Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(A)

MWG plans to retrofit the Ash Surge Basin by executing the following sequential steps:

1. Removing the CCR from the basin and transporting the material to a beneficial-use facility or a permitted disposal facility in accordance with current and historic Station maintenance procedures for the Ash Surge Basin;
2. Obtaining a construction permit from the Illinois EPA for retrofitting the Ash Surge Basin;
3. Removing the gravel warning and sand cushion layers over the existing geomembrane liner from the basin and transporting these materials to a permitted disposal facility;
4. Decontaminating the basin's existing geomembrane liner for re-use as a supplemental liner in the retrofitted basin, including submittal of visual inspection documentation and analytical testing results to demonstrate the existing liner is not contaminated with CCR constituents in accordance with 35 Ill. Adm. Code 845.770(a)(4);
5. Decontaminating the basin's appurtenant structures (e.g., inlet troughs and aprons, outlet structures, piping);
6. Placing structural fill within the basin floor to establish the slopes for the new leachate collection and removal system and to support the new composite liner (see Section 2.1);
7. Installing an alternative composite liner system in accordance with 35 Ill. Adm. Code 845.410 and 40 CFR 257.72 (see Section 2.2);
8. Installing a leachate collection and removal system in accordance with 35 Ill. Adm. Code 845.420 (see Section 2.3);
9. Submitting to the Illinois EPA:
 - a. A retrofit completion report (see Section 8.0), and
 - b. A certification from a qualified professional engineer licensed in the State of Illinois that the Ash Surge Basin has been retrofitted in accordance with the activities outlined in this retrofit plan (or subsequent amendment of this retrofit plan), the requirements stipulated in 35 Ill. Adm. Code Part 845, and the requirements of 40 CFR 257.102(k).

2.1 STRUCTURAL FILL

Pursuant to 35 Ill. Adm. Code 845.420(a)(3), the retrofitted Ash Surge Basin will have a new leachate collection and removal system that slopes towards a collection pipe at a minimum slope of three percent. Because the existing basin floor is approximately flat, MWG plans to place, compact, and grade structural fill along the basin floor to establish the lines and grades for the new leachate collection and removal system. The structural fill will be placed over the Ash Surge Basin's existing HDPE geomembrane liner, which MWG plans to leave in-place as a supplemental liner under the basin's new composite liner. All earthwork activities

associated with placing, compacting, and grading structural fill along the basin floor will be done in a manner to prevent tearing, ripping, or otherwise damaging the Ash Surge Basin's existing HDPE geomembrane liner.

2.2 COMPOSITE LINER SYSTEM

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.410(a) & 845.400(c)

Federal CCR Rule Reference: 40 CFR 257.72(a) & 257.70(c)

MWG plans to retrofit the Ash Surge Basin with an alternative composite liner system that meets the requirements of 35 Ill. Adm. Code 845.400(c) and 40 CFR 257.70(c). The composite liner will consist of a 60-mil HDPE geomembrane over a geosynthetic clay liner (GCL). Pursuant to 35 Ill. Adm. Code 845.400(c)(2) and 40 CFR 257.70(c)(1), the GCL component will have a hydraulic conductivity of no more than 1×10^{-9} cm/sec to ensure that the liquid flow rate through the GCL is less than the liquid flow rate through two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec.

2.3 LEACHATE COLLECTION & REMOVAL SYSTEM

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.420(a)

In addition to installing a new composite liner in the basin, MWG plans to install a new leachate collection and removal system (LCRS) in the Ash Surge Basin pursuant to 35 Ill. Adm. Code 845.420. This LCRS will be placed over the new composite liner and will be constructed of drainage geocomposite with a transmissivity of at least 6×10^{-4} m²/sec in accordance with 35 Ill. Adm. Code 845.420(a)(4). The drainage geocomposite will consist of an HDPE geonet core with a non-woven geotextile layer heat-laminated to each side of the geonet core, and will be sloped towards a perforated collection pipe installed in a trench along the middle of the basin. As discussed in Section 2.1, the structural fill placed along the basin floor will ensure the drainage geocomposite slopes towards the collection pipe at a slope of at least three percent pursuant to 35 Ill. Adm. Code 845.420(a)(3). This collection pipe will then convey leachate to the existing discharge pipe at the northern end of the retrofitted Ash Surge Basin to ultimately be discharged out of the basin. This drainage geocomposite and collection pipe system will ensure leachate flows from all points within the basin to the sump, will be constructed in such a way as to prevent clogging of the LCRS during the active life and post-closure care period of the basin, and will be large enough to conduct periodic cleaning. The upper non-woven geotextile component of the drainage geocomposite will also prevent CCR and non-CCR sediments from intruding into, clogging, and impeding the flow of leachate through the HDPE geonet core.

In addition to the upper non-woven geotextile component of the drainage geocomposite, a sand filter layer will be installed above the retrofitted Ash Surge Basin's LCRS to prevent CCR and non-CCR sediments from clogging the LCRS. This sand filter layer will have a hydraulic conductivity of at least 1×10^{-5} cm/sec pursuant to 35 Ill. Adm. Code 845.420(a)(2). Meanwhile, the upper non-woven geotextile component of the drainage

geocomposite will preclude the intrusion of sand particles from the filter layer into the HDPE geonet core's apertures, which would otherwise impede the flow of leachate through the geonet.

Finally, in accordance with 35 Ill. Adm. Code 845.420(a)(8), a protective warning layer will be installed over the sand filter layer to provide a means of deflecting the force of CCR flowing into the retrofitted Ash Surge Basin. Along the floor of the retrofitted Ash Surge Basin, this uppermost layer will be comprised of coarse aggregate materials to provide a working surface for operators removing CCR from the basin; it will also serve as a means of warning these operators that they have reached the basin floor and to stop excavating. Along the basin's side slopes, the protective warning layer will consist of riprap on a gravel bedding layer to protect the sand filter layer from erosion.

3.0 CCR REMOVAL & DECONTAMINATION PROCEDURES

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(1)(B)

Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(B)

After temporarily ceasing all flows into the impoundment, MWG will remove the ash stored above the granular protective layers covering the Ash Surge Basin's existing geomembrane liner in accordance with the Station's usual cleaning and maintenance practices. After the ash stored in the Ash Surge Basin has been removed, the retrofit work described in Section 2.0 will be performed in accordance with this retrofit plan (or subsequent amendment of this retrofit plan) and the construction permit issued by the Illinois EPA.

After receiving a retrofit construction permit from the Illinois EPA, MWG will first remove the granular protective layers covering the Ash Surge Basin's existing geomembrane liner: a 6-inch-thick gravel warning layer and a 12-inch-thick sand cushion layer. MWG will also remove an 18-inch-thick layer gravel warning layer above the basin's existing geomembrane liner between the basin's concrete weir wall and discharge pipe. These materials will be loaded onto trucks and transported to a permitted disposal facility. Because these materials are likely to contain CCR materials, the trucks transporting the material off-site will carry manifests pursuant to 35 Ill. Adm. Code 845.740(c)(1)(A) and as specified in 35 Ill. Adm. Code 809. In addition, a CCR transportation plan will be prepared in accordance with 35 Ill. Adm. Code 845.740(c)(1)(B) which will include:

- Identification of the transportation method selected;
- The frequency, time of day, and routes of CCR transportation;
- Any measures to minimize noise, traffic, and safety concerns caused by the transportation of the CCR;
- Measures to limit fugitive dust from any transportation of CCR;
- Installation and use of a vehicle washing station;
- A means of covering the CCR for any mode of CCR transportation;

- A requirement that the CCR is transported by a permitted special waste hauler under 35 Ill. Adm. Code 809.201.

On-site fugitive dust control measures will also be implemented as necessary to minimize airborne CCR particulates while CCR and CCR-impacted materials are being removed and handled. Pursuant to 35 Ill. Adm. Code 845.740(c)(2)(A), these dust control measures will include a water spray, commercial dust suppressant, or a combination of these.

Prior to the removal of the granular protective layers covering the Ash Surge Basin's existing geomembrane liner, signage will be posted at the Station's entrance warning of the hazards of CCR dust inhalation in accordance with 35 Ill. Adm. Code 845.740(c)(3)(A). Pursuant to 35 Ill. Adm. Code 845.740(c)(3)(B), a written notice will be issued to each of the local governments through which the CCR-impacted material will be transported. This written notice will include an explanation of the hazards of CCR dust inhalation, the aforementioned CCR transportation plan, and a tentative transportation schedule.

After the granular protective layers in the basin have been removed, MWG will begin decontaminating the Ash Surge Basin's existing geomembrane liner to be re-used as a supplemental liner under the new composite liner. The basin's inlet troughs and aprons, outlet structures, associated piping, *etc.* will also be decontaminated. At a minimum, decontamination procedures will include pressure washing of the geomembrane liner and pond appurtenances in a systematic manner to remove all boiler wash water sediments. Following decontamination, the existing geomembrane liner will be visually inspected, and an electrical leak location survey will be conducted to ensure the liner is competent. Analytical tests will also be conducted in accordance with the construction permit issued by the Illinois EPA at the time of the retrofit work to demonstrate that the liner is not contaminated with CCR constituents. The results from the visual inspection and analytical tests will be submitted to the Illinois EPA for approval of re-using the existing geomembrane liner as a supplemental liner under the new composite liner in the retrofitted Ash Surge Basin.

4.0 ESTIMATED MAXIMUM INVENTORY OF CCR TO BE REMOVED

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(1)(C)

Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(C)

For the purposes of this retrofit plan, the maximum amount of CCR that will be removed during the retrofit of the Ash Surge Basin is conservatively based on the estimated maximum capacity of the basin: 162,000 cubic yards.

5.0 ESTIMATED LARGEST AREA TO BE RETROFITTED

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(1)(D)

Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(D)

The estimated largest area of the Ash Surge Basin to be retrofitted is anticipated to be the basin's full surface area: 8.4 acres.

6.0 RETROFIT SCHEDULE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(1)(E)

Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(E)

MWG expects to complete the retrofit work for the Ash Surge Basin in 2025. Table 1 lists the major milestones necessary for retrofitting the Ash Surge Basin and the expected duration for completing each milestone.

Table 1 – Planning Level Schedule for Retrofitting the Ash Surge Basin

Activity	Estimated Duration
Prepare Retrofit Construction Design Documents	2 Months
Obtain Retrofit Construction Permit from Illinois EPA	18 Months
Hire Contractor to Complete Retrofit Activities in Accordance with Illinois EPA Permit	4 Months
Remove Protective Granular Layers Above Existing Liner	1 Month
Decontaminate Existing Liner and Basin Appurtenances (Including Laboratory Testing)	3 Months
Obtain Approval from Illinois EPA to Re-Use Existing Liner as Supplemental Liner	6 Weeks
Install Composite Liner System	6 Weeks
Install Leachate Collection and Removal System (Including Filter and Protective Layers)	6 Weeks
Submit Retrofit Completion Report and Certification to Illinois EPA	2 Weeks
Obtain Approval of Retrofit Completion Report and Certification from Illinois EPA	6 Weeks
Complete and Certify Retrofit of the Ash Surge Basin	--

7.0 AMENDMENTS TO CLOSURE PLAN

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(3)

Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(iii)

This retrofit plan will be amended in accordance with 35 Ill. Adm. Code 845.770(c)(3) and 40 CFR 257.102(k)(2)(iii) if a change in the operation of the Ash Surge Basin would substantially affect this retrofit plan or if an unanticipated event necessitates a revision to this retrofit plan. Any and all amendments to this retrofit plan will be certified by a qualified professional engineer licensed in the State of Illinois in accordance with 35 Ill. Adm. Code 845.770(c)(4) and 40 CFR 257.102(k)(2)(iv).

8.0 COMPLETION OF RETROFIT ACTIVITIES

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(g)

Federal CCR Rule Reference: 40 CFR 257.102(k)(4)

Upon completion of all retrofit activities required by 35 Ill. Adm. Code Part 845 and 40 CFR 257.102(k) and approved by the Illinois EPA in a construction permit, a retrofit completion report and certification will be submitted to the Illinois EPA. The retrofit completion report will include (1) the engineering and hydrogeology reports containing monitoring well completion reports, boring logs, all construction quality assurance (CQA) reports, certifications, designations of CQA officers-in-absentia required by 35 Ill. Adm. Code 845.290; (2) photographs with time, date, and location information of the liner system and leachate collection system; (3) other photographs relied upon for documentation of construction activities; (4) a written summary of the retrofit requirements and completed activities as stated in the construction permit and 35 Ill. Adm. Code 845; and (5) any other information relied upon by the qualified professional engineer for the certification. Pursuant to 35 Ill. Adm. Code 845.770(g)(2) and 40 CFR 257.102(k)(4), the certification will be prepared by an independent, qualified professional engineer licensed in the State of Illinois and will verify that the Ash Surge Basin has been retrofitted in accordance with this retrofit plan (or subsequent amendment of this retrofit plan), the requirements of 35 Ill. Adm. Code Part 845, and the requirements of 40 CFR 257.102(k). Finally, within 30 days of the Illinois EPA approving the retrofit completion report and certification, a notification of completion of retrofit activities will be prepared in accordance with 35 Ill. Adm. Code 845.770(h).

9.0 CERTIFICATION

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(4)

Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(iv)

I certify that:

- This written retrofit plan for the Ash Surge Basin was prepared by me or under my direct supervision.
- The work was conducted in accordance with the requirements of 35 Ill. Adm. Code 845.770 and with the requirements for 40 CFR 257.102(k).
- I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin

Date: March 24, 2023

Seal:

