

CCR Rule Report:

Run-on and Run-off Control System Plan

Hennepin Power Station CCR
Landfill, Putnam County, Illinois

*Submitted to Dynegy Midwest Generation, LLC
October 2016*

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Run-on and Run-off Control System Plan

1. Introduction

In accordance with 40 CFR 257.81(c), the owner or operator of a Coal Combustion Residuals (CCR) landfill must prepare an initial surface water run-on and run-off control system plan no later than October 17, 2016, and revise the plan every five years. This plan addresses the surface water management for the Hennepin Power Station's Coal Combustion Residuals CCR Landfill (CCR Landfill). The surface water controls are designed to collect and route run-off from the final landfill cover and from the CCR Landfill during operation in accordance with 40 CFR 257.81.

1.1 Site Description

The CCR Landfill is located east of the Hennepin Power Station Plant. The facility is located on the south bank of the Illinois River approximately 4 miles northeast of Hennepin Township, Illinois. More specifically, it is located within the northeast quarter of Section 26, Township 33 North, Range 2 West, Putnam County, Illinois.

The CCR Landfill was designed to be constructed over the top of Hennepin Power Station's inactive Ash Pond No. 2 and will be developed over five phases. Phase I, totaling approximately 4.5 acres, was constructed in 2010 and has been inactive since that time. A coarse layer of bottom ash material has been placed over the surface of the Phase 1 cell to prevent erosion and provide freeze protection to the bottom liner system. The remaining 15.5 acres have not yet been developed. Refer to Appendix A for a figure of the CCR Landfill layout.

Surface water management features for the CCR Landfill include:

- Run-on from undisturbed areas;
- Run-off from disturbed areas — CCR Landfill cells;
- Run-on/run-off from temporary and intermediate CCR Landfill cover; and
- National Pollutant Discharge Elimination System (NPDES) Outfall Location.

The CCR Landfill is a permit-exempt facility designed, constructed and operated in compliance with all applicable requirements of 35 Ill. Adm. Code 811, 812 and 815. An initial facility report is on file with the Illinois Environmental Protection Agency (IEPA). The stormwater management design of the CCR Landfill was done in compliance with 35 Ill. Adm. Code Section 811.103. These regulations are equal to or more stringent than the requirements set forth in 40 CFR 257.81. Design calculations were performed for both the interim and fully constructed and closed conditions, allowing for phased expansion as needed.

1.2 Design Criteria

The 40 CFR 257.81 requirements for run-on and run-off controls for CCR landfills follow.

The owner or operator of an existing or new CCR landfill or any lateral expansion of a CCR landfill must design, construct, operate and maintain:

1. A run-on control system to prevent flow onto the active portion of the CCR unit during the peak discharge from a 25-year, 24-hour storm; and

2. A run-off control system from the active portion of the CCR unit to collect and control at least the water volume resulting from a 25-year, 24-hour storm.

In addition, run-off from the active portion of the CCR unit must be handled in accordance with U.S. Environmental Protection Agency (USEPA) rules governing the discharge of surface water (see 40 CFR Part 257.3-3).

The CCR Landfill is designed, constructed, operated and maintained using criteria either equivalent to or in exceedance of the requirements of 40 CFR 257.81.

2. Run-on Control

The CCR Rule defines run-on to mean any liquid that drains over land onto any part of a CCR landfill or any lateral expansion of a CCR landfill. In surface water hydrology, run-on is a quantity of surface run-off, or excess rain, snowmelt or other sources of water that flows from an upstream catchment area onto a specific downstream location. The CCR Rule requires that a CCR landfill be designed, constructed, operated and maintained to prevent flow onto the active portion of a CCR landfill during the peak discharge from a 25-year, 24-hour storm. The USEPA has adopted this requirement to minimize the amount of surface water entering a CCR landfill and to minimize disruption of a CCR landfills operation because of stormwater inflow.

The CCR Landfill is bordered to the north by the Illinois River, to the east by the Leachate Pond and to the south by the East Ash Pond and the former Ash Pond No. 4. The CCR Landfill is separated from those entities by stormwater ditches. Surface water from areas outside the western perimeter of the CCR Landfill flows into the East Ash Pond. Surface water from areas outside the eastern, northern, and southern perimeters of the CCR Landfill flows to the stormwater ditches which flow respectively to the Leachate Pond, the East Ash Pond and the former Ash Pond No. 4.

As the CCR Landfill expands to the west, the North and South Stormwater Ditches and Perimeter Stormwater Conveyance Pipes will extend accordingly, directing run-on around the expanded footprint.

3. Run-off Control

The CCR Rule defines run-off to mean any liquid that drains over land from any part of a CCR landfill. Effectively, run-off is the portion of rainwater, snowmelt or other liquid that does not infiltrate CCR material and travels overland. Typically, run-off is the product of the inability of water to infiltrate into soil because of the saturation or infiltration rate capacity being exceeded. The CCR Rule requires that a CCR landfill be designed, constructed, operated and maintained to collect and control at least the water volume resulting from a 25-year, 24-hour storm. The owner or operator must design, construct, operate and maintain a CCR landfill in such a way that the maximum run-off rate generated from a 25-year, 24-hour storm must be collected through hydraulic structures, such as drainage ditches, toe drains, swales or other means, and controlled so as to not adversely affect the condition of the CCR landfill. The USEPA has promulgated these requirements to minimize the detention time of run-off on a CCR landfill and minimize infiltration into a CCR landfill, to dissipate stormwater run-off velocity and minimize erosion of CCR landfill slopes.

Run-off from CCR material in the inactive Phase I of the CCR Landfill drains into the leachate collection piping system, which ultimately drains by gravity to the Leachate Pond and then the East Polishing Pond which is discharged at NPDES Outfall 003.

Once the CCR Landfill reaches design capacity, a final cover system will be installed and include stormwater management structures that route water to Cover Downchutes and Cover Ditches to control run-off from the final cover system. Cover Downchutes and Cover Ditches will convey flow to the North and South Stormwater Ditches that will drain to Leachate Manholes that are in-line with the Perimeter Stormwater Conveyance Pipes. The North and South Stormwater Conveyance Pipes will drain to the east and discharge to the Leachate Pond. The Leachate Pond discharges to the East Polishing Pond. The East Polishing Pond discharges to the Illinois River at NPDES Outfall 003.

4. Surface Water Management Structures

Calculations for ditches, downchutes, conveyance pipes and collection piping are discussed in greater detail in Appendix B of the "Run-on Run-off Control System Documentation for Hennepin CCR Landfill" in the Hennepin Power Station operating record. These stormwater management structures are designed, constructed, operated and maintained to safely carry at least the maximum run-off rate from the 25-year, 24-hour design event.

Once future expansions are constructed, updated calculations will be appended to this report to reflect as-built conditions.

5. Operation and Maintenance

Routine maintenance activities, including repair of scoured areas, removal of debris and excess sediment buildup and restoration or revegetation of areas to prevent erosion, are performed on an as-needed basis.

Inspections by site personnel are performed to identify areas having surface water scouring or excessive erosion. Areas observed to have excessive erosion or scouring are assessed to identify the cause of the erosion or scouring. Remedial measures such as regrading, reseeding and placement of more effective erosion control methods are implemented as necessary. Prior to reaching final grades, some areas may require additional channels, berms, straw bales or silt fences to provide temporary drainage and sediment control.

6. NPDES Permitting

Run-off from the CCR Landfill will be discharged to the Illinois River in accordance with and as authorized by the station's NPDES Permit No. IL0001554. Effluent limitations, monitoring and reporting requirements specific to this discharge are identified for Outfall 003 in that permit, thereby meeting the requirements of 40 CFR 257.3-3 as necessitated by 40 CFR 257.81(b).

7. Conclusion

The CCR Landfill design, construction, operation and maintenance is in compliance with the requirements of 40 CFR 257.81 for the following reasons:

- The run-on control system is designed to prevent flow onto the active portion of the CCR Landfill during the 25-year, 24-hour storm event. This meets the 25-year, 24-hour storm requirements of 40 CFR 257.81.
- The run-off control system for the active portion of the CCR Landfill is designed to collect and control the water volume resulting from a 25-year, 24-hour storm event. This meets the 25-year, 24-hour storm requirements of 40 CFR 257.81.
- Discharges from the CCR Landfill are permitted under NPDES Permit No. IL0001554, thereby satisfying the requirement that run-off from the CCR Landfill is handled according to USEPA rules governing the discharge of surface water (see 40 CFR Part 257.3-3).

This document serves as the initial plan. The plan and revisions must be certified by a qualified Professional Engineer and entered into Hennepin Power Station's operating record.

8. References

Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule, 40 CFR 257 (April 17, 2015).

9. Certification Page

**HENNEPIN POWER STATION CCR LANDFILL
DYNEGY MIDWEST GENERATION, LLC
INITIAL RUN-ON AND RUN-OFF CONTROL SYSTEM SUMMARY AND CERTIFICATION**

40 CFR 257.81 requires the owner or operator of an existing CCR landfill to design, construct, operate and maintain:

- A run-on control system to prevent flow onto the active portion of the CCR unit during the peak discharge from a 25-year, 24-hour storm; and
- A run-off control system from the active portion of the CCR unit to collect and control at least the water volume resulting from a 25-year, 24-hour storm.

In addition, run-off from the active portion of the CCR unit must be handled in accordance with the surface water requirements under 40 CFR Part 257.3-3.

As a qualified Professional Engineer as defined by 40 CFR 257 Subpart D, I certify that I have personally examined and am familiar with the design information contained in the Hennepin Power Station CCR Landfill Run-on and Run-off Control System Plan and supporting document, the Run-on Run-off Control System Documentation for the Hennepin Power Station, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete.

I certify that the **Hennepin Power Station's CCR Landfill** Run-on and Run-off Control System Plan meets or exceeds the requirements set forth by 40 CFR 257.81 as published on April 17, 2015.

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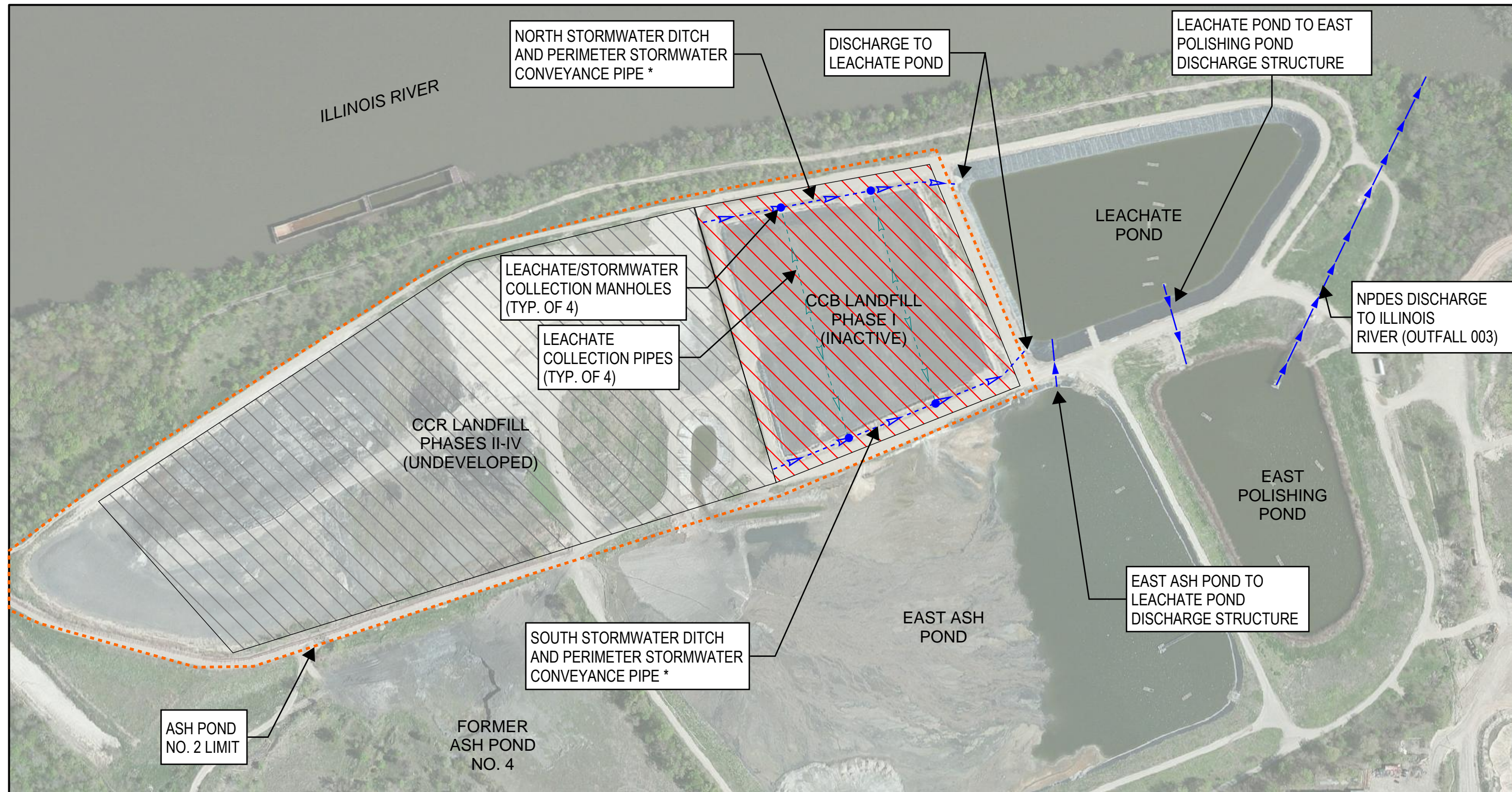
Signature: _____

A handwritten signature in cursive script that reads "David B. Hoots".

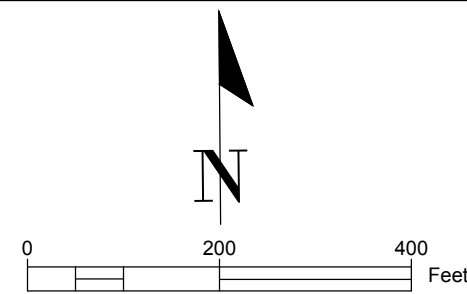
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Appendix A
Landfill Layout Figure

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* NOTE: THE PERIMETER STORMWATER CONVEYANCE PIPES ARE BURIED DIRECTLY BELOW THE NORTH/SOUTH STORMWATER DITCHES.



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CCR LANDFILL LAYOUT FIGURE

HENNEPIN CCR LANDFILL
HENNEPIN POWER STATION
PUTNAM COUNTY, ILLINOIS

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FIGURE NO. 1