

CCR Rule Report:

# **Run-on and Run-off Control System Plan**

Duck Creek Power Station  
CCR Landfill, Fulton County,  
Illinois

*Submitted to Illinois Power Resources  
Generating, 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 Duck Creek Power Station's 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 southeast of Canton, Illinois, approximately 3 miles north of the Duck Creek Power Station generating facility in Fulton County, Illinois. More specifically, the facility is located within Sections 7 and 18 of Banner Township, Township 6 North, Range 5 East of the Fourth Principal Meridian.

The CCR Landfill design consists of approximately 106 acres. At the present time, only the north 22 acres (Cells 1A and 1B) of the CCR Landfill have been constructed. The remaining 84 acres have not yet been developed as a CCR landfill. 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;
- Run-on/run-off from temporary and intermediate CCR Landfill cover;
- Outfall structures and haul road culverts; and
- Duck Creek Reservoir.

The CCR Landfill is permitted as a non-hazardous special waste landfill with Illinois Environmental Protection Agency (IEPA), Bureau of Land, Division of Land Pollution Control. The facility is designed, constructed and operated in compliance with all applicable requirements of 35 Ill. Adm. Code 811, 812 and 815. The stormwater management design of the CCR Landfill was done in compliance with IEPA regulations found in 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 minimize disruption of a CCR landfill's operation because of stormwater inflow.

Surface water run-on is prohibited from entering the active area of the CCR Landfill by perimeter berms, which allow flow to be directed around the unit. This surface water discharges naturally into the Duck Creek Reservoir.

Southward expansions to the CCR Landfill will extend the east and west perimeter berms 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 to minimize erosion of CCR landfill slopes.

Run-off from CCR material and temporary intermediate cover in the active area of the CCR Landfill flows to the perimeter ditches at the toe of the CCR placement limit and carry run-off southward. The perimeter ditches flow around the perimeter of the active area to a Temporary Outfall Location at the southeast corner of the active area. Culverts have been installed across the perimeter ditches to allow hauling of CCR material into the active area. Discharges from the Temporary Outfall Location are conveyed by gravity flow through a Temporary Discharge Pipe to Duck Creek Reservoir.

Once the CCR Landfill reaches design capacity, a final composite cover system will be installed, allowing clean stormwater to discharge into secondary perimeter ditches outside the CCR placement boundary. The secondary perimeter ditches will allow clean run-off to ultimately flow to one of four outlet structures, and ultimately discharge into the Duck Creek Reservoir. Outlet Structure 1 was constructed during the initial landfill (active area) construction, but is currently not used. Outlet Structure 1 is comprised of a culvert through the perimeter berm with an energy dissipation structure on the downstream side to decrease the flow velocity. Construction of the final composite cover system has not yet commenced.

#### **4. Surface Water Management Structures**

Calculations for perimeter ditches, outlet structures and culverts are discussed in greater detail in Appendix B of the *Run-on Run-off Control System Documentation for Duck Creek CCR Landfill* in the Duck Creek 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.

Calculations for the fully constructed and covered CCR Landfill design are also included in Appendix B of the *Run-on Run-off Control System Documentation for Duck Creek CCR Landfill*. 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 active and undeveloped portions of the CCR Landfill discharges into the Duck Creek Reservoir. The outfall from the reservoir is regulated under National Pollutant Discharge Elimination System (NPDES) Permit No. IL0055620 in accordance with 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 at least 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 at least the 25-year, 24-hour storm event. This meets the 25-year, 24-hour storm requirements of 40 CFR 257.81.
- Discharges to Duck Creek Reservoir are permitted under NPDES Permit No. IL0055620, 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 Duck Creek 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**

**DUCK CREEK POWER STATION CCR LANDFILL  
ILLINOIS POWER HOLDINGS, LLC  
INITIAL RUN-ON AND RUN-OFF CONTROL SYSTEM SUMMARY AND CERTIFICATION**

The 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.

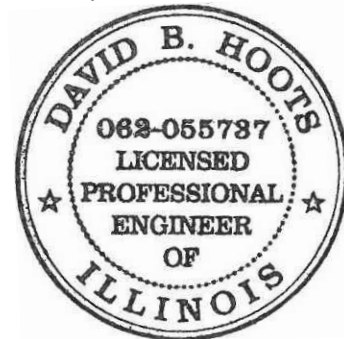
In addition, run-off from the active portion of the CCR unit must be handled in accordance with the surface water requirements under 40 CFR Part 257.3-3.

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 Duck Creek Power Station CCR Landfill Run-on and Run-off Control System Plan and supporting document, the Run-on Run-off Control System Documentation Plan for the Duck Creek 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 **Duck Creek Power Station 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.

David B. Hoots, P.E.  
Hanson Professional Services Inc.  
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Signature: \_\_\_\_\_

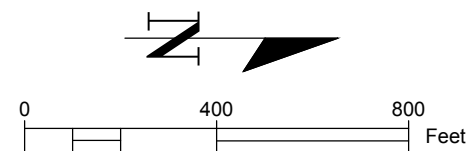
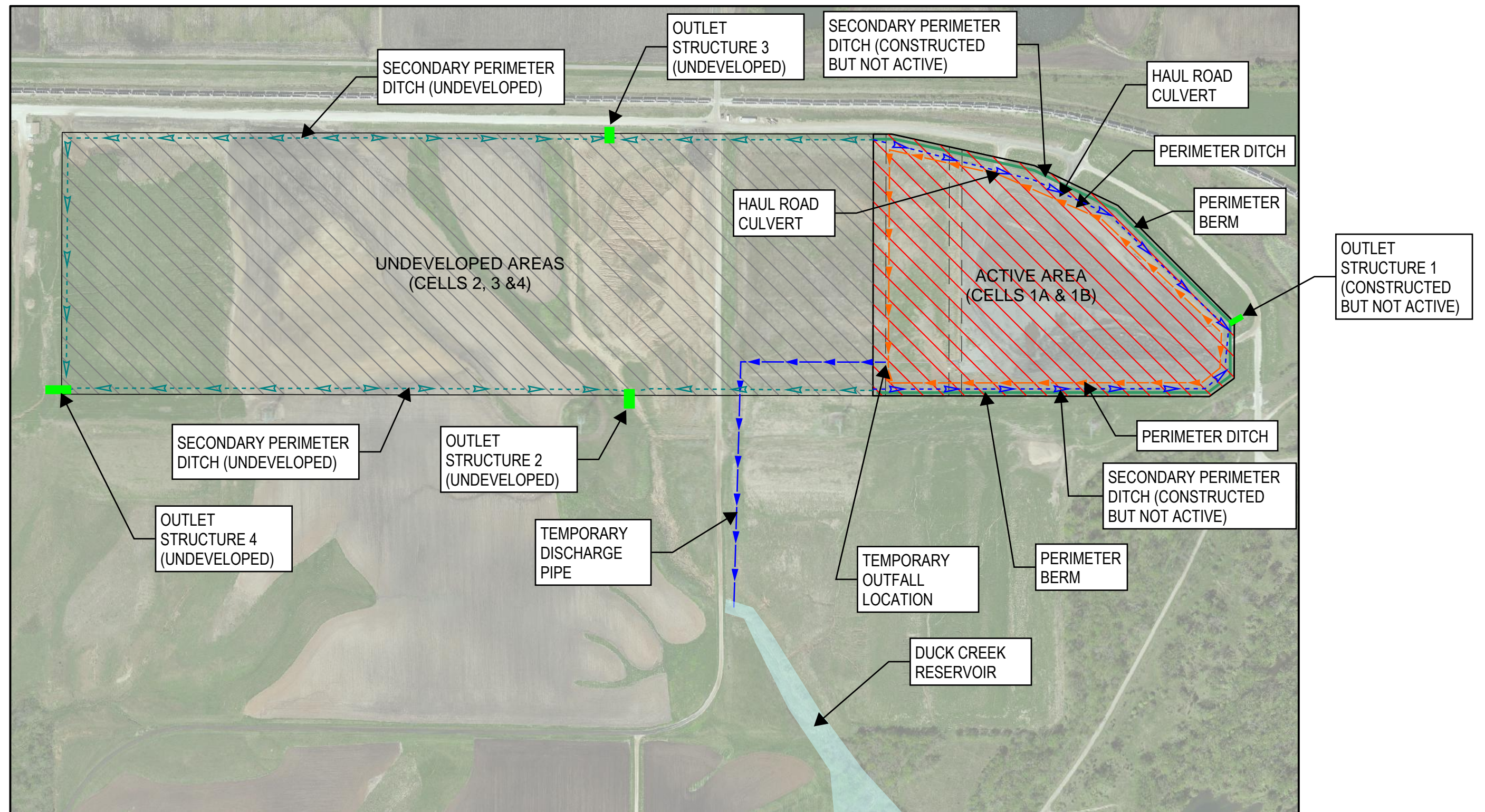
A handwritten signature in cursive script that reads "David B. Hoots".

Date: 10/13/2016, LICENSE EXPIRES 11/30/2017



**Appendix A**  
**CCR Landfill Layout Figure**

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CCR LANDFILL LAYOUT FIGURE

DUCK CREEK CCR LANDFILL  
DUCK CREEK POWER STATION  
FULTON COUNTY, ILLINOIS

15E0143-DATE: 10/13/2016

FIGURE NO. 1