RUN-ON AND RUN-OFF CONTROL SYSTEM PLAN

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Bottom Ash CCR Landfill
Stanton Station
Great River Energy

Submitted To: Great River Energy
Stanton Station
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Golder Associates

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1.0 INTRODUCTION

Golder Associates Inc. (Golder) has prepared the following plan for the Bottom Ash CCR Landfill (Bottom Ash Landfill) at Great River Energy's (GRE's) Stanton Station (SS). The Environmental Protection Agency's (EPA) Coal Combustion Residual (CCR) Rule, 40 Code of Federal Regulations (CFR) Part 257, promulgated April 17, 2015 and effective October 19, 2015, requires the creation and maintenance of an initial Run-On and Run-Off Control Plan, as specified in in 40 CFR §257.81, no later than October 17, 2016 for all existing or new CCR landfills or lateral expansions (EPA 2015).

2.0 REQUIREMENTS FOR RUN-ON AND RUN-OFF CONTROL SYSTEMS

In accordance with § 257.81(b)(1), the plans must document how the run-on and run-off systems have been designed and constructed to meet the following criteria, as supported by appropriate engineering calculations, for CCR landfills:

- The Run-on Control System must be designed to prevent flow onto the active portion of the CCR unit during the peak discharge from a 24-hour, 25-year storm; and
- The Run-off Control System from the active portion of the CCR unit must be designed to collect and control at least the water volume resulting from a 24-hour, 25-year storm, in accordance with § 257.3-3, detailing discharges to surface waters.

Further clarification on the intent of the rule is provided in the text of the Preamble for the CCR Rule:

> *The owner or operator must design, construct, operate,, and maintain the CCR landfill is such a way that any runoff generated from at least a 24-hour, 25-year 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. EPA has promulgated these requirements to minimize the detention time of run-off on the CCR landfill and minimize infiltration into the CCR landfill, to dissipate storm water run-off velocity, and to minimize erosion of CCR landfill slopes. An additional concern with run-off from CCR landfills is the water quality of the run-off, which may collect suspended solids from the landfill slopes.*

Descriptions of the run-on and run-off control systems designed for and operated at the Bottom Ash Landfill at Stanton Station are described below.

3.0 RUN-ON CONTROL

Run-on is defined as stormwater that may flow towards the active portions of landfill. The run-on control system for the Bottom Ash Landfill at Stanton Station consists of perimeter embankments, ditches, and grading with slopes directing water away from the facility to prevent stormwater run-on.

An earthen embankment separates the facility on the north, west, and south sides from existing surface water drainage ditches. The embankment varies in height from 8 to 15 feet, and water collected and/or flowing through the surface water drainage ditches is directed away from the facility. The surface water drainage ditches are graded and maintained along the toe of the embankment of the facility.

The Bottom Ash CCR Surface Impoundment (Bottom Ash Impoundment) is located along the east side of the Bottom Ash Landfill. All precipitation associated with the Bottom Ash Impoundment is collected within its three cells, and will not contribute run-on to the Bottom Ash Landfill.

4.0 RUN-OFF CONTROL

Run-off at the Bottom Ash Landfill consists of both contact water (namely water having directly contacted CCR within the active area of the landfill), and non-contact stormwater (water that has contacted temporary or final cover).

4.1 Contact Water Run-Off Controls

Placement of bottom ash in the landfill began in the eastern end of the landfill area (along the Bottom Ash Impoundment embankment) and will continue incrementally to the west. Earthen embankments surround the landfill area allowing enclosed disposal of bottom ash.

The landfill floor is graded to direct contact water to the west between the western embankment and the toe of placed bottom ash within the landfill. Contact water collected within the landfill footprint will evaporate, or during wet periods, will be pumped into the active cell of the Bottom Ash Impoundment. Water may also be used to control dust by sprinkling it over the surface of placed bottom ash. The Bottom Ash Landfill is currently operating with its largest precipitation capture area (10.5 acres) and is expected to collect approximately 3.2 acre-feet of water during the 24-hour, 25-year storm event (3.65 inches, NOAA 2016). The current approximate capacity of the west side of the Bottom Ash Landfill is 35 acre-feet.

As the bottom ash grades rise above the perimeter embankments, contact water control channels will be developed between the embankments and the placed bottom ash. These channels will route contact water to the east end where it will be managed as described above. Revised contact water calculations will be performed as required to size run-off control features in accordance with §257.81.

4.2 Non-Contact Water Run-off Controls

Non-contact water run-off will be shed from the temporary or final covered slopes. The Bottom Ash Landfill will be closed with 15% slopes. The slopes will promote surface water run-off, aid in preventing surface water from ponding on the final cover, and will allow for maintenance of the final cover (erosion repairs, mowing, etc.). Surface water run-off from the Bottom Ash Landfill will sheet flow off the temporary or final cover, down vegetated downstream embankment faces and into surface water drainage ditches that carry stormwater away from the facility.

The design slopes are flat enough (maximum 15% slopes) to minimize erosion of the final cover soils without construction of terrace channels or armored down-chute channels. The combination of soil types, grasses, and surface water controls have been selected to control long-term soil loss.

5.0 CERTIFICATION

The undersigned attest to the completeness and accuracy of the above written run-on and run-off control plans, and certify that the plans meet the requirements detailed in 40 CFR §257.81.

GOLDER ASSOCIATES INC.

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TS/CS/rjg

6.0 REFERENCES

EPA. 2015. Environmental Protection Agency, Code of Federal Regulations Title 40 Part 257: Hazardous and Solid Waste Management System; *Disposal of Coal Combustion Residuals from Electric Utilities*. April.

NOAA. 2016. *National Oceanic and Atmospheric Administration – Hydrometeorological Design Studies Center Precipitation Frequency Data Server (PFDS).* Retrieved October 3, 2016, from http://hdsc.nws.noaa.gov/hdsc/pfds/.

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