INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

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Bottom Ash CCR Surface Impoundment
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

Great River Energy (GRE) owns and operates Stanton Station (SS), located approximately 3 miles southeast of Stanton, North Dakota. GRE manages coal combustion residuals (CCR) in several existing landfills and surface impoundments including the Bottom Ash CCR Surface Impoundment (Bottom Ash Impoundment).

Golder Associates Inc. (Golder) has prepared this inflow design flood control plan for the Bottom Ash Impoundment on behalf of GRE as required under 40 CFR §257.82(c).

2.0 REQUIREMENTS FOR HYDROLOGIC AND HYDRAULIC CAPACITY SYSTEMS

In accordance with §257.82(a)(1) and § 257.82(a)(2), the inflow design flood control system must adequately manage flow into the CCR unit during and following the peak discharge and must adequately manage flow from the CCR unit to collect and control the peak discharge resulting from the inflow design flood. The requirements for appropriate inflow design floods are as follows:

- For a high hazard potential CCR surface impoundment, the probable maximum flood;
- For a significant hazard potential CCR surface impoundment, the 1,000-year flood;
- For a low hazard potential CCR surface impoundment, the 100-year flood;
- For an incised CCR surface impoundment, the 25-year flood.

The Bottom Ash Impoundment is classified as a low hazard potential CCR surface impoundment, and the inflow design flood control system plan is based on the 24-hour, 100-year storm event (4.95 inches). The inflow design flood control system designed for and operated at the Bottom Ash Impoundment is described below.

3.0 INFLOW DESIGN FLOOD CONTROL SYSTEM

The Bottom Ash Impoundment consists of three composite-lined cells (north, south, and center cells). The north and south cells are active cells used to temporarily store and dewater bottom ash and the center cell functions as a retention cell. Bottom ash is sluiced into one of the active cells until the cell reaches capacity. Water is continually decanted off of the active cells during bottom ash deposition. Once capacity for CCR material is reached, bottom ash deposition is directed to the other active cell and the filled cell is dewatered by decanting remaining water through the outlet structure to the center cell. Bottom ash remaining in the filled cell is excavated and hauled to the adjacent Bottom Ash CCR Landfill for disposal (Stone & Webster 1994).

The design crest of the soil embankments surrounding the Bottom Ash Impoundment are approximately 15 to 20 feet above surrounding topography (elevation 1720 feet), preventing stormwater run-on into the Bottom Ash Impoundment. The cells operate with a minimum of 2 feet freeboard (elevation 1718 feet).

3.1 Flood Control Calculation

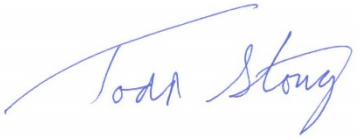
Contributing capture-areas are slightly larger than the maximum water surface areas (cells plus the top of embankments). The total capture area for the Bottom Ash Impoundment is approximately 12.7 acres (1.5 acres of embankment crest and 11.2 acres of pool). Based on the 24-hour, 100-year storm event (4.95 inches), it is estimated that approximately 5.2 acre-feet of precipitation will be collected in the Bottom Ash Impoundment during the 24-hour, 100-year storm (assuming 100% of the precipitation falling on the crest and pool is captured). Assuming the impoundment is at the maximum operating freeboard of 2 feet (elevation 1718 feet) during the storm event, the facility's operating pool capacity is roughly 22.4 acre-feet (between elevation 1718 and 1720 feet). The estimated 5.2 acre-feet of run-off will raise the water level in the Bottom Ash Impoundment cells by approximately 0.5 feet to an elevation of 1718.5 feet, leaving approximately 1.5 feet of remaining freeboard to the top of the berm at elevation 1720 feet.

Water discharge is managed from the active cells (north and south cells) through passive drainage to the center cell. The active (north and south) cells are connected to the center cell via weir discharge structures with removable stop logs, preventing the active cells from reaching water levels above elevation 1718 feet. A weir discharge structure with removable stop logs at the east end of the center cell is set so that the cell continuously decants water to a discharge pipe with a maximum water level set at approximately 1717.5 feet.

4.0 CERTIFICATION

The undersigned attest to the completeness and accuracy of this inflow design flood control plan, and certify that the plan meets the requirements of 40 CFR §257.82(c).

GOLDER ASSOCIATES INC.



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5.0 REFERENCES

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Stone & Webster. 1994. *Plan of Operations – Stanton Station – Bottom Ash Surface Impoundment and Bottom Ash Landfill.* June.

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