Periodic Structural Stability Assessment
Bottom Ash Pond
Sherburne County Generating Plant

Introduction

This report presents the assessment and certification of structural stability for the Bottom Ash Pond (BAP) at the Sherburne County Generating Plant (Sherco) in Becker, Minnesota. The initial structural stability assessment was certified on October 17th, 2016. The BAP is an "existing" (i.e., received coal combustion residuals both before and after October 14, 2015) surface impoundment. On September 29, 2020, Bottom Ash Pond No. 2 (BAP2) became operational and sluice lines were transitioned from BAP to BAP2. On October 31, 2020, BAP ceased receipt of CCR. This document addresses the requirements of 40 CFR Section 257.73(d), Periodic structural stability assessments.

Compliance with §257.73(d)

The following statements assess if the BAP was designed, constructed, operated, and maintained with:

(i) *Stable foundations and abutments:*
The BAP is located in the Anoka sand plain region and the native soils consist of coarse sand with some gravel near the surface and intermittent glacial till approximately 20 to 30 feet below ground. This surficial geology provides a stable foundation and good source of dike construction materials.

(ii) *Adequate slope protection to protect against surface erosion, wave action, and adverse effect of sudden drawdown.*
The BAP was designed and constructed with an interior vertical clay core supported by interior and exterior compacted fill at a 2.5 to 1 horizontal to vertical (2.5H:1V) slopes. The outboard slope is finished with vegetated topsoil for erosion control. The pond dimensions are short enough as to be not conducive to wind-induced wave set-up. Nonetheless, inboard slopes are covered with a minimum five-foot-thick layer of bottom ash to prevent wave action from impacting the structural dike fill. This provides a stable geometry and adequate slope protection.

The discharge structure of the BAP is not large enough to create rapid drawdown, however, the interior soils supporting the clay core are coarse with high permeability rates and can quickly dewater, reducing pore pressure and the impacts of drawdown. Details of the design can be found in the referenced construction certification reports.

(iii) *Dikes mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit*

The dikes were designed and analyzed to withstand the range of loading conditions from the initial to maximum water elevation. All soils used to construct the BAP dikes were mechanically compacted a minimum to 90% standard proctor density. Results of the in-place density tests and safety factor assessment can be found in the reference documents.

(iv) Vegetated slopes of dikes and surrounding areas not to exceed a height of six inches above the slope of the dike, except for slopes which have an alternate form or forms of slope protection

The BAP exterior slopes are mowed to prevent the growth of woody or deep-rooted vegetation. Vegetation is dense enough to prevent erosion of the dike exterior slope.

(v) A single spillway or a combination of spillways configured as specified in paragraph (d)(1)(v) of this section.

(A) The BAP discharge structure (spillway) is constructed of reinforced concrete and is designed to carry sustained flows.
(B) The BAP can collect and contain a 1,000-year flood event without discharging, however, the spillway can adequately manage flow following a 1,000-year flood event.

(vi) Hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit that maintain structural integrity and are free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the hydraulic structure.

The discharge structure is open at the top and has access ladders inside for visual inspection, and no damage has been observed. The flow velocity through the discharge structure and outlet pipe which discharges to an adjacent incised basin is sufficient to prevent sediment from accumulating.

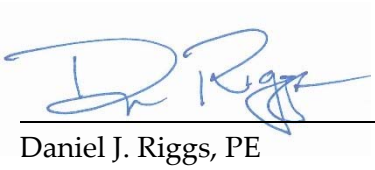
(vii) For CCR units with downstream slopes which can be inundated by the pool of an adjacent water body, such as a river, stream or lake, downstream slopes that maintain structural stability during low pool of the adjacent water body or sudden drawdown of the adjacent water body.

The Recycle basin is located downstream of but not immediately adjacent to the BAP. This basin is incised and utilizes a compacted clay liner, therefore fluctuating water levels do not affect the BAP embankments.

The CCR unit is designed, constructed, operated, and maintained with recognized and generally accepted engineering practices for stable containment of the maximum volume of CCR and CCR wastewater which can be impounded.

Certification

I hereby certify under penalty of law that this report was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment.



October 17, 2021
Date

Daniel J. Riggs, PE
License No. 49559

References (included in Operating Record and Website)

Carlson McCain, Inc. (October 2016). "Safety Factor Assessment, Bottom Ash Pond, Sherburne County Generating Plant", CCR Compliance Document, Plymouth, Minnesota.

Carlson McCain, Inc. (October 2016). "Initial Hazard Potential Assessment, Bottom Ash Pond, Sherburne County Generating Plant", CCR Compliance Document, Plymouth, Minnesota.

Carlson McCain, Inc. (October 2016). "History of Construction, Bottom Ash Pond, Sherburne County Generating Plant", CCR Compliance Document, Plymouth, Minnesota.