

## Initial 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 BAP is an “existing” surface impoundment. This document addresses the requirements of 40 CFR Section 257.73(d), Periodic structural stability assessments.

## Compliance with §257.73(d)

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). 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.

- (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 through the discharge structure, pipe and outlet in to an adjacent incised basin is sufficient enough 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 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 good engineering practices for 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.



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Daniel J. Riggs, PE  
License No. 49559

October 17, 2016  
Date

**References (included in Operating Record and Website)**

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

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

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