



January 4, 2019

Xcel Energy, Inc.  
Sherburne County Generating Station  
13999 Industrial Blvd.  
Becker, MN, 55308

**Re: 2018 Annual Inspection of Bottom Ash Pond**

The Bottom Ash Pond (BAP) inspection was conducted on October 22<sup>nd</sup>, 2018 by Daniel J. Riggs, a professional engineer licensed in the State of Minnesota. Prior inspections were conducted in 1996, 2008, 2009, 2013 by the Minnesota Department of Natural Resources (DNR); in August 2009 by the EPA; annually from 2010 to 2014 by Qualified Professional Engineers in accordance with the DNR and Minnesota Pollution Control Agency (MPCA) inspection requirements; and annually since 2015 by a Qualified Professional Engineer in accordance with Coal Combustion Residual (CCR) Rules.

The following items were evaluated as a part of the section 257.83 inspection:

- i) *Any changes in geometry of the impounding structure since the previous inspection*

Periodic topographic surveys, most recently in July, have been conducted on the BAP since the final phase of construction was completed in 1982. During that time, no changes in pond geometry or embankment alignment have been observed.

- ii) *The location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection*

There is no instrumentation for water level or dike stability, however water level elevation in the BAP is controlled by stop-logs as described in section iii.

- iii) *The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection*

The BAP discharges to the Recycle Basin over concrete stop-logs located in the discharge structure. These stop-logs are added or removed to raise or lower the impounded water level in the BAP. In 2018, the maximum water level was maintained at an elevation of 974 feet mean sea level (MSL) until May to promote bottom ash material deposition, then lowered to a minimum elevation of 966 feet MSL allowing access to deposited material by excavation equipment. The liner at the bottom of the BAP is at elevation 946 feet MSL, therefore the minimum and maximum impounded water depths are 20 and 28 feet, respectively.

The lowest elevation of deposited CCR in the BAP since the last inspection was approximately 962 MSL. The maximum elevation of deposited CCR in the BAP was at approximately 980 MSL prior to excavation. The minimum and maximum CCR depths equate to 8 and 34 feet, respectively.

*iv) The storage capacity of the impounding structure at the time of the inspection*

The remaining capacity of the BAP from the surface of CCR during the July 2018 survey to an elevation of 998 feet MSL (top of clay liner) was approximately 641,000 Cubic Yards. The remaining capacity of the BAP from the present water level elevation of 970 feet MSL to top of clay liner (elevation 998 feet MSL) was approximately 580,000 Cubic Yards.

*v) The approximate volume of the impounded water and CCR at the time of the inspection*

There was approximately 11,000 Cubic Yards of impounded water and 355,000 Cubic Yards of CCR in the BAP at the time of the July survey.

*vi) Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit and appurtenant structures*

The exterior of the BAP was inspected for structural weakness in the form of seepage by walking a traverse at the base, mid-slope, and top of the embankment. Signs of seepage would include moss or marshy vegetation at the toe-drain along the base, soft or saturated areas, patches of grass more lush than the surrounding area, or flowing "springs". There were no signs that seepage had previously or is presently occurring on the BAP.

The discharge pipe corridor was inspected for signs of a leakage, such as saturated areas or sinkholes. No signs of leakage were observed along the pipe corridor between the BAP and the Recycle Basin.

The water level in the BAP is controlled by concrete stop-logs in the discharge. All decreases in water level are attributed to the removal of stop logs.

*vii) Any other changes(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection*

There have not been any changes that have affected the stability of the pond. I have reviewed the CCR Unit Design and Construction information and have observed no deviations from those documents.

Sincerely,  
Daniel J. Riggs, PE  
License No. 49559  
Senior Engineer  
Carlson McCain, Inc.





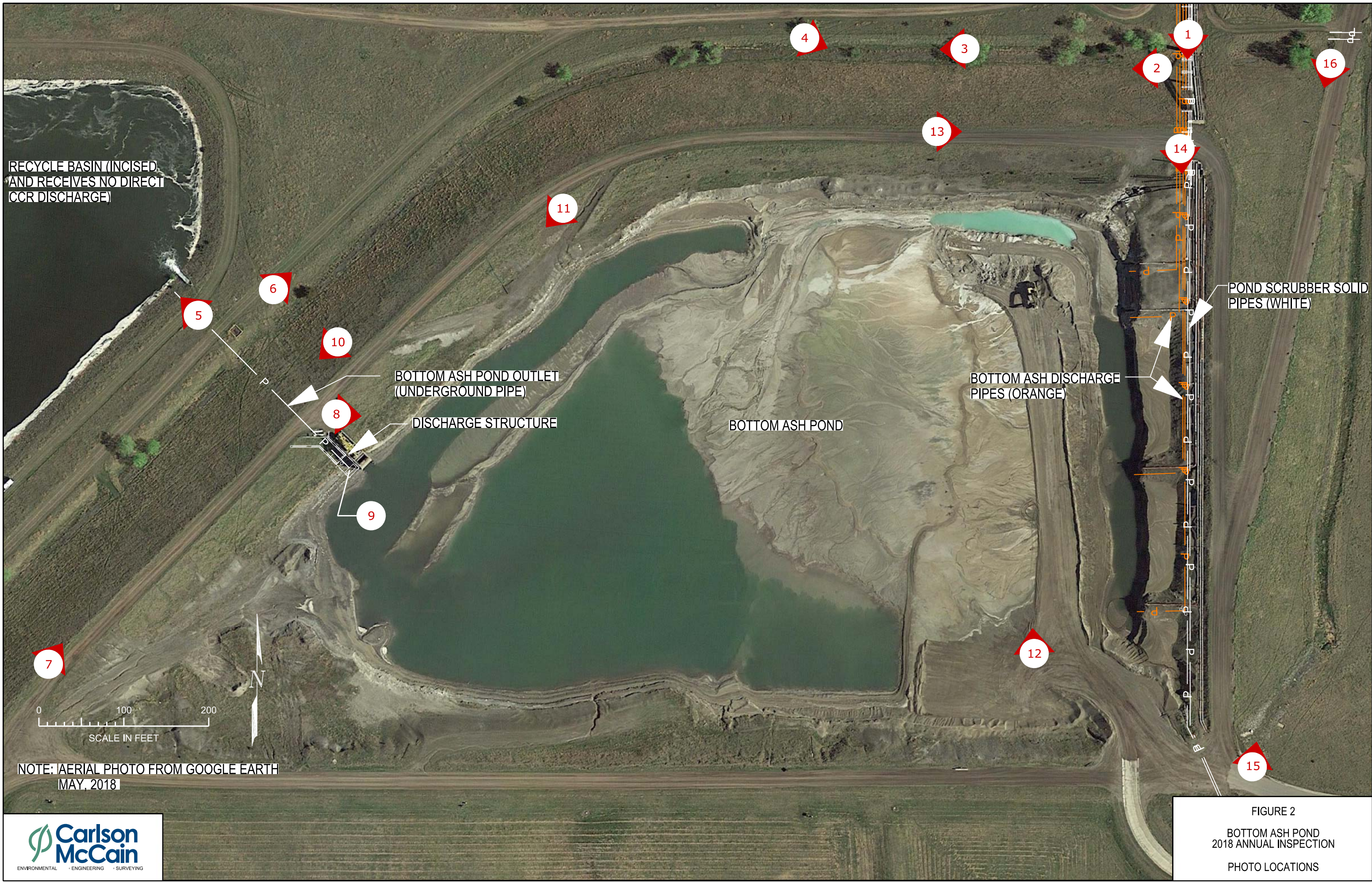
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P:\Projects\XCEL\3404-13 Sherco Dam Safety Inspection\October 2018 CCR Inspection\figures\Figure 1 - BAP Inspection.dgn



FIGURE 1  
BOTTOM ASH POND  
2018 ANNUAL INSPECTION  
POND LAYOUT







## Bottom Ash Pond Annual Inspection - October 2018



Photo 1	Bottom ash and scrubber pipes, looking south.
10/22/2018	



Photo 2	North embankment and perimeter ditch, looking west.
10/22/2018	



## Bottom Ash Pond Annual Inspection - October 2018



Photo 3	North embankment and riprap toe drain, looking west.
10/22/2018	



Photo 4	North embankment and riprap toe drain, looking east.
10/22/2018	



## Bottom Ash Pond Annual Inspection - October 2018



Photo 5	Bottom Ash Pond secondary outlet to Recycle Basin (Primary outlet is below the water level of the Recycle Basin).
10/22/2018	



Photo 6	Northwest embankment, looking northeast.
10/22/2018	



## Bottom Ash Pond Annual Inspection - October 2018



Photo 7	Northwest embankment, looking northwest.
10/22/2018	



Photo 8	Pond interior, looking east.
10/22/2018	



## Bottom Ash Pond Annual Inspection - October 2018



Photo 9	Photo from inside the discharge structure. Shows stop-log metal channels
10/22/2018	and water flowing over concrete stop-log at the bottom of the channel.



Photo 10	Mid-slope of northwest embankment, looking southwest.
10/22/2018	



## Bottom Ash Pond Annual Inspection - October 2018



Photo 11	Pond interior, looking southwest.
10/22/2018	



Photo 12	Pond interior, looking north.
10/22/2018	



## Bottom Ash Pond Annual Inspection - October 2018



Photo 13	Mid-slope of north embankment, looking east.
10/22/2018	



Photo 14	Interior of east embankment, looking south.
10/22/2018	



## Bottom Ash Pond Annual Inspection - October 2018



Photo 15	East embankment, looking north.
10/22/2018	



Photo 16	CCR Unit identification marker placed in accordance with Section 257.73.
10/22/2018	