



## **2016 Annual Landfill Inspection**

***Big Stone Plant - Ash Disposal Area***

**Big Stone City, South Dakota**

Prepared for  
Otter Tail Power Company

December 2016

2016 Annual Landfill Inspection

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## Certifications

I hereby certify that I, or someone under my direct supervision, have examined the Big Stone Plant Ash Disposal Area CCR Landfill, and, being familiar with the provisions of 40 CFR 257 Subp. D and standard practices of the industry, I have determined that the Ash Disposal Area design, construction, operation, and maintenance are consistent with generally accepted good engineering standards.



Paul T.  
Swenson  
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Paul T. Swenson, P.E.  
Barr Engineering Co.  
Registration Number 8949

Dated this 19<sup>th</sup> day of December, 2016

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## 1.0 Introduction

Otter Tail Power Company (OTP) operates the Big Stone Plant (Big Stone), located near Big Stone City, South Dakota. Big Stone is a coal-fired electrical generator that results in production of coal combustion residuals (CCR). CCR management is subject to Federal Standards for Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments per 40 CFR 257 Subpart D (CCR Rule). CCR generated by the plant is placed in an on-site landfill or sent off-site for beneficial use. The on-site landfill is known as the Ash Disposal Area (ADA).

The ADA is required to meet the CCR Rule for landfills, and is therefore subject to annual inspections by a qualified professional engineer (QPE). This report documents the 2016 ADA annual inspection, as required by the CCR Rule.

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## **2.0 Review of Existing Information**

Existing information was reviewed to confirm that the design, construction, operation and maintenance of the ADA are consistent with recognized and generally accepted good engineering standards. No deficiencies were found and the existing information reviewed is described in following subsections.

### **2.1 Results of Weekly Inspections**

Weekly landfill inspections were conducted by a qualified person during 2016. Inspection reports from January 1, 2016 through October 8, 2016 were reviewed as part of the QPE annual inspection.

### **2.2 Results of Previous Annual Inspections**

The 2015 annual inspection report was reviewed in preparing this 2016 report. The 2015 report concluded that the facility was in conformance with industry practices and state permit and rule requirements.

Additional construction information has become available since the 2015 report was prepared. Section 4 in this report includes updates to calculation of volume of CCR in place and ultimate capacity consistent with the updated information.



## 3.0 Structural Integrity and Operational Review

An on-site inspection was performed on October 13, 2016 to visually identify signs of distress or malfunction of the CCR Unit. The results of the inspection are included in the following subsections.

### 3.1 Visual Inspection of Ash Disposal Area

Inspection consisted of on-foot inspection of perimeter berms and embankments, the active ADA face, and final covered areas. Visual inspection items and results are summarized in the following table:

**Table 3-1 Summary of Visual Inspection**

Item	Visual Inspection Description	Visibly Observed (Yes/No)	Notes
1	Proper placement of waste	Yes	No issue with placement of waste at time of inspection.
2	Adequate slope stability and erosion control	Yes	No significant erosion identified at time of inspection.
3	Run-on and Run-off controls properly functioning	Yes	Surface water controls appeared adequate at time of inspection.
4	Surface water percolation minimized	Yes	No surface water ponding on the waste surface or excessive leachate generation observed at time of inspection.
5	Contact water systems properly operated and maintained	Yes	No systems issues observed at time of inspection.
6	Water quality monitoring systems maintained and operating	Yes	Existing monitoring wells were accessible and appeared to be in good condition at time of inspection.
7	Dust adequately controlled	Yes	Small amount of dusting was observed when wind gusts kicked up at time of inspection.
8	Geometry of ADA is unchanged from previous inspection.	NA	The geometry of the ADA is unchanged from 2015.
9	Animal burrows absent or of no significance	No	Apparent burrow approximately 5' long and about 2-3' deep on the east dike slope. Burrow was reported to be filled by OTP after the inspection and prior to preparation of this report.
10	Adequate vegetation density and vegetation maintenance	Yes	Vegetation appeared well established and well maintained at time of inspection.
11	Debris controlled or absent	Yes	No debris present at time of inspection.

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## **3.2 Other Changes**

No other changes to the CCR Unit design, maintenance, or operations were observed as part of the annual inspection that could affect the stability or operation of the CCR Unit.



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## 4.0 Volume of CCR Contained in ADA

A topographic survey conducted in July 2016 was used as the basis for estimating the volume of CCR contained in the ADA at the time of the inspection. Analysis of topographic data collected in 1974 compared to the 2016 topographic survey results in an estimate of 2,700,000 cubic yards of CCR in place in July 2016. Based on a consistent filling rate since the most recent previous topographic survey (November 2010 LiDAR survey) and extrapolating to the October 13, 2016 inspection, an estimated 2,710,000 cubic yards of CCR were in place in the ADA at the time of the QPE inspection.

The CCR volume in place is a little smaller than reported in the 2015 annual inspection report (2.8 million cubic yards). The 2016 in-place volume calculation is considered more precise than the 2015 calculation.