STATE OF NORTH DAKOTA

PUBLIC SERVICE COMMISSION

Montana-Dakota Utilities Co. **Advance Determination of Prudence – Big Stone Air Application**	**Case No. PU-11-163**
Otter Tail Power Company **Advance Determination of Prudence – Big Stone Air Application**	**Case No. PU-11-165**

FINDINGS OF FACT, CONCLUSIONS OF LAW AND ORDER

MAY 9, 2012

Appearances

Commissioners Tony Clark, Brian P. Kalk, and Kevin Cramer.

Mark Bring, Associate General Counsel, 215 S. Cascade St., Fergus Falls, MN 56538-0496, appearing on behalf of Otter Tail Power Company.

B. Andrew Brown, Dorsey & Whitney LLP, Suite 1500, Minneapolis, MN 55402 on behalf of Otter Tail Power Company and Montana-Dakota Utilities Co.

Mark Gruman, Public Service Commission, State Capitol, 600 E. Boulevard Av., Bismarck, North Dakota 58505, on behalf of the Public Service Commission advocacy staff.

Illona Jeffcoat-Sacco, General Counsel, Public Service Commission, State Capitol, 600 E. Boulevard Av., Bismarck, North Dakota 58505, on behalf of the Public Service Commission advisory staff.

Daniel S. Kuntz, Associate General Counsel, P.O. Box 5650, 1200 West Century Avenue, Bismarck, ND 58506-5650, appearing on behalf of Montana-Dakota Utilities Co.

Al Wahl, Administrative Law Judge, Office of Administrative Hearings, 1701 North Ninth Street, Bismarck, North Dakota 58501-1882.

Preliminary Statement

On May 20, 2011, Applicants Montana-Dakota Utilities Co. (Montana-Dakota) and Otter Tail Power Company (Otter Tail) filed separate applications with the North Dakota Public Service Commission (Commission) seeking an advance determination of prudence (ADP) under North Dakota Century Code § 49-05-16 for a proposed Air Quality Control System project (AQCS) at the Big Stone Plant (Big Stone).

On July 27, 2011, the Commission issued a Notice of Filing and Notice of Intervention deadline of September 2, 2011. No parties intervened in these proceedings.

On September 7, 2011, the Commission issued a Notice of Consolidated Hearing for November 29, 2011. The Notice specified the issue to be considered was whether the proposed AQCS resource addition is prudent.

The Commission held the consolidated hearing on the applications on November 29, 2011 in the Commission Hearing Room, 12th floor, State Capitol, Bismarck, North Dakota.

On January 9, 2012, Montana-Dakota, Otter Tail, and Public Service Commission Advocacy Staff filed a Settlement Agreement.

On January 27, 2012, the Commission issued a Notice of Opportunity for Hearing on the Settlement Agreement providing until March 7, 2012 for comments or requests for hearings. No comments or requests for hearing were received.

Having allowed all interested persons an opportunity to be heard and having heard, reviewed and considered all testimony and evidence presented, the Commission makes the following:

Findings of Fact

1. Otter Tail is an investor-owned electric utility headquartered in Fergus Falls, Minnesota authorized to provide public utility service in North Dakota.

2. Montana-Dakota is an investor-owned electric utility headquartered in Bismarck, North Dakota authorized to provide public utility service in North Dakota.

3. The Big Stone Plant (Big Stone) is a coal-fired power plant located approximately 2.5 miles northwest of Big Stone City in Grant County, South Dakota, near the Minnesota-South Dakota border. Big Stone has a single cyclone fired boiler that burns low sulfur Powder River Basin coal. Big Stone is rated at 495 MW gross electricity generation and 475 MW net electricity generation.

4. Big Stone has three investor-owned utility co-owners. NorthWestern Energy owns a 23.4% share, Montana-Dakota owns a 22.7%, and Otter Tail owns 53.9% and serves as Big Stone's operating agent.

5. Big Stone is the largest baseload resource for each of the co-owners and provides electricity to their customers in North Dakota, South Dakota, Minnesota, and Montana. Only Otter Tail and Montana-Dakota serve North Dakota customers.

I. Clean Air Act

A. *Regional Haze*

6. The federal Clean Air Act, 42 U.S.C. § 7479, mandates a national goal of remedying and preventing visibility impairment from man-made air pollution in specified Class I areas of the United States. Class I areas include 156 national parks and wilderness areas.

7. The Environmental Protection Agency (EPA) promulgated the Regional Haze Rule in 1999 (49 CFR Part 51), and a revised rule in 2005 to implement the Clean Air Act's requirement of improving visibility in Class I areas. The Regional Haze Rule includes the requirement to procure, install and operate Best Available Retrofit Technology (BART) on major generating sources, including existing electric generating units that were placed into operation between 1962 and 1977. Big Stone began commercial operation on May 1, 1975.

8. Under the Regional Haze Rule, state environmental agencies are authorized to submit a State Implementation Plan (SIP) to EPA. Absent state action, EPA must adopt a plan that addresses existing emissions from sources within the state that contribute to regional haze, with the goal of no man-made visibility impairment in Class I areas by 2064.

9. Otter Tail performed an evaluation to determine the visibility impact of its existing operations on seven Class I areas that are located in Michigan, Minnesota, North Dakota, and South Dakota. Based on the results, the South Dakota Department of Environment and Natural Resources (South Dakota DENR) determined that Big Stone emissions contribute to an impairment of visibility in multiple Class I areas and is therefore subject to BART.

10. On September 15, 2010, the South Dakota DENR, Board of Minerals and Environment adopted a South Dakota Regional Haze Rule, Administrative Rules of South Dakota chapter 74:36:21. The South Dakota Regional Haze Rule imposed emission limits for three pollutants that contribute to regional haze. The South Dakota Regional Haze Rule limits nitrogen oxides to 0.10 lb/mmBtu, compared to 0.86 lb/mmBtu in the current permit, sulfur dioxides to 0.09 lb/mmBtu, compared to 3.0 lb/mmBtu in the current permit, and particulate matter to 0.012 lb/mmBtu, compared to 0.26 lb/mmBtu in the current permit.

11. Under the South Dakota Regional Haze Rule, Big Stone must achieve BART compliance expeditiously but no later than five years after EPA's approval of the South Dakota SIP.

12. During the South Dakota rulemaking process, Otter Tail recommended that selective non-catalytic reduction technology (SNCR) combined with separated overfire air be used to reduce NOx.

13. On January 21, 2011, the South Dakota DENR submitted the South Dakota SIP to the EPA. The South Dakota SIP proposed the following technologies for Big Stone:

- selective catalytic reduction technology (SCR) with separated overfire air for control of NOx.
- Semi-dry flue gas desulfurization for control of SO_2.
- Baghouse for control of particulate matter.

14. On March 29, 2012, the EPA approved the South Dakota SIP with publication of the final rule in the Federal Register to follow. The final rule was published in the Federal Register on April 26, 2012.

B. *Mercury Control*

15. The 1990 Amendments to the Clean Air Act required EPA to study the effects of emissions of specified hazardous air pollutants by electric steam generating plants, including mercury emissions. EPA commenced rulemaking to control mercury under the Maximum Achievable Control Technology (MACT) provision of the Clean Air Act, § 112, and the agency published the proposed Mercury and Air Toxics Standards (often referred to as Utility MACT) in the May 3, 2011 Federal Register. The EPA finalized the Utility MACT on December 21, 2011 and published the rule in the February 16, 2012 Federal Register.

16. Utilities have three years to achieve compliance with the Utility MACT.

II. Resource Analysis for Big Stone

17. The Big Stone AQCS Project consists of a semi-dry flue gas desulphurization (FGD) system with for control of SO_2, selective catalytic reduction technology (SCR) with separated overfire air for control of NOx, a new baghouse for control of particulate matter, and activated carbon injection (ACI) for control of mercury emissions.

18. North Dakota Century Code § 49-05-16 provides that a public utility that intends to make a resource addition (including modification of a generation facility) may file an application with the Public Service Commission for an advance determination that the resource addition is prudent.

19. The applicants presented a cost estimate prepared by the engineering firm Sargent & Lundy for the AQCS project, excluding the ACI of $489,397,400 in 2015 dollars, with an accuracy of plus or minus 20 percent. Applicants estimated an additional cost of installation of the ACI for mercury control of $5,012,700. The AQCS cost estimate total of $494,410,100 includes engineering, procurement, construction, supervision, and management costs for the project.

20. Sargent & Lundy compared the cost estimate to similar projects that Sargent & Lundy has completed; and to available industry data, adjusted for plant size and year in-service. Sargent & Lundy compared scope, quantities, equipment, labor hours, and costs in the cost estimate for the AQCS project to other similar projects. Sargent & Lundy believes the cost estimate is consistent with other comparable projects.

21. The Applicants considered coal, hydropower, nuclear as options for retiring Big Stone. Hydropower and nuclear generation were rejected due to current statutory restrictions or because they could not be available in the time frame required for BART compliance.

22. The Applicants assessed the comparative construction and operation costs of Big Stone with AQCS to three natural gas alternatives: conversion of the Big Stone Plant boiler to natural gas, construction of a new 475 MW combined cycle gas turbine (CCGT), and construction of a new 475 MW CCGT and purchased wind energy. The analysis concluded Big Stone with the AQCS was the least-cost option.

23. The Applicants considered a gas-fired combustion turbine and a heat-recovery boiler at the Big Stone site, and the use of that steam generation to power the existing Plant turbine. Approximately two-thirds of the generation would come from the new gas-fired generation and one-third would come from the existing steam turbine. Using the one-third to two-third ratio, the generation from Big Stone would be required to increase from 475 MW to 1,425 MW. This additional generation would overload available transmission and thus could not be available before the AQCS Project's compliance deadline. Due to the time delay, the mismatch of resources and the high cost for such a sizeable gas plant, this response scenario was not further evaluated.

24. The Applicants considered repowering the existing Big Stone Plant with biomass, but the AQCS would still be required.

25. Burns & McDonnell's levelized cost analysis demonstrated the Big Stone Plant with the AQCS is the most economic scenario. The levelized cost for Big Stone with the AQCS is $70.89/MWh (2016 dollars). The next most cost-effective option, the CCGT plus wind energy purchases, is $100.43/MWh (2016 dollars), which is 42% more expensive than the AQCS option.

26. Sensitivity analyses were performed for the AQCS and each of the alternatives for capital costs (plus or minus 30%), fuel costs (plus or minus 20%), and O&M costs (plus or minus 20%). The analyses demonstrated that the AQCS remained the least cost option over the range of sensitivities evaluated by a significant margin.

27. Otter Tail conducted Strategist modeling to identify the least-cost suite of generation resources in terms of Net Present Value of Revenue Requirements for the 15-year planning period 2011-2025.

28. In 21 of 22 scenarios modeled, Strategist selected the Big Stone Plant with the AQCS project as a part of the least cost resource plan. The only scenario in which the Big Stone Plant was not selected in the resource mix was one where unlimited market purchases were allowed, based on the capacity and energy price forecasts included in the IRP. This resulted in 450 MW of capacity being purchased from the market.

29. Montana-Dakota separately analyzed the cost effectiveness of the Big Stone AQCS project as part of its 2011 IRP submitted to the Commission on May 12, 2011. Montana-Dakota modeled the AQCS project as a resource addition beginning in 2015. The AQCS was compared with other alternative to determine if it would be more cost-effective to retire the Plant or install the AQCS to allow for its continued operation.

30. Montana-Dakota modeled sensitivity scenarios consisting of assumptions regarding higher capital costs for both the AQCS project and combustion turbines. In the AQCS scenario, the project cost was incrementally increased to determine at what point other alternatives would be preferred. With the modeled cost of the AQCS project nearly doubled from the original estimated cost, the project was still selected as part of Montana-Dakota's resource plan recommended in its 2011 IRP.

31. Commission Advocacy Staff testified that participating in the MISO market as an alternative to generation from the Big Stone Plant would subject the Applicants' ratepayers to too great a risk of market fluctuations.

32. Commission advocacy staff witness Richard Hahn also testified that the proposed AQCS project is cost effective and is the preferred option as compared to the reasonable alternatives.

33. Based on the Burns & McDonnell levelized cost analysis, the Applicants' respective analysis, and analysis by Advocacy Staff, the Commission finds that the continued operation of Big Stone is prudent and a least cost alternative to securing alternative generation.

34. Applicants' Exhibit 111 is the South Dakota SIP. As testified by Applicants' witness, Terry Graumann, Table 6-14 on page 95 of Exhibit 111 represents the deciview visibility impairment contribution for each control technology Otter Tail included in its BART process. OTP recommended option #6 (SNCR) to South Dakota, however, South Dakota selected option #8 (SCR). We note that for options # 6, #7 and #8, each deciview visibility impairment is less than 0.5, the EPA threshold. Mr. Graumann further testified that South Dakota's DENR cost-effectiveness test was $900 per ton, and options #6, #7 and #8 are less than $900 per ton.

35. In response to questions from Commissioner Clark on Exhibit 111, Mr. Graumann agreed that despite the decision by South Dakota that SCR represented BART, the visibility improvement by employing SCR as opposed to SNCR could be imperceptible.

36. Exhibit 111 also discloses a capital cost differential of $69,900,000 between employment of option #6, SCR, and option #8, SNCR. The Commission notes that the difference in cost between the two technologies is less than the difference in the accuracy differentials in Applicants' cost estimate for SCR, that is plus or minus 20 percent, or plus or minus $97,879,480.

37. The Commission makes no finding regarding the prudence of the air quality control technologies proposed by the applicants. Nothing in this order states or implies the Commission is determining the prudence of any particular air quality control technology. Given the cost difference in the technologies and the insignificant difference in visibility improvement between the technologies, the Commission chooses not to bind a future Commission on the question of the prudence of one air quality control technology compared to another. That question is best left to a future proceeding in which rate recovery is requested.

From the foregoing Findings of Fact, the Commission makes the following:

Conclusions of Law

1. The Commission has jurisdiction in this matter.

2. In comparison to generation alternatives, the continued operation of the Big Stone Plant is prudent.

From the foregoing Findings of Fact and Conclusions of Law, the Commission makes its:

Order

The Commission orders that the Applicants' requests for an advance determination of prudence for their proposed participation in the Big Stone AQCS project are hereby granted subject to the following conditions:

1. No determination is made in this order regarding the prudence of using either SCR or SNCR technology in the AQCS.

2. The Applicants shall submit semi-annual reports to the Commission, beginning in June 2012, and continuing through June 2017, regarding the amounts and types of costs incurred with respect to the AQCS project, and any changed circumstances that will materially affect the cost, schedule or installation of the AQCS project.

3. Consistent with subsection 6 of North Dakota Century Code § 49-05-16, the Applicants must be prepared to demonstrate in subsequent rate recovery proceedings the reasonableness of all costs incurred or obligated to implement the AQCS project. The Applicants must also be prepared to demonstrate in subsequent rate recovery proceedings that any costs incurred, other than AFUDC, the AQCS were prudently incurred.

PUBLIC SERVICE COMMISSION

Kevin Cramer	**Tony Clark**	**Brian P. Kalk**
Commissioner	**Chairman**	**Commissioner**