

215 South Cascade Street  
PO Box 496  
Fergus Falls, Minnesota 56538-0496  
218 739-8200  
www.otpco.com

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**JUL 02 2012**

**SOUTH DAKOTA PUBLIC  
UTILITIES COMMISSION**



June 29, 2012

Ms. Patty Van Gerpen  
Executive Director  
South Dakota Public Utilities Commission  
Capitol Building, 1<sup>st</sup> Floor  
500 E. Capitol Ave.  
Pierre, SD 57501-5070

**Subject: Otter Tail Power Company's Ten Year Biennial Plan - 2012**

Dear Ms. Van Gerpen:

Pursuant to the rules of the South Dakota Public Utilities Commission Energy Facility Plans ARSD 20:10:21 and Guidelines issued October 1977, Otter Tail Power Company hereby files its Biennial Ten Year Plan with the Commission. Ten Copies are being sent to you by U.S. mail.

Notice of Filing of the plan is being sent to each of the state agencies and officers designated in Section 23 of the Energy Facility Plans. If additional copies of the plan are required, please contact me at [kkaseman@otpco.com](mailto:kkaseman@otpco.com) or 218-739-8693.

Very truly yours,

A handwritten signature in cursive script that reads "Kerry Kaseman".

Kerry Kaseman  
Resource Planner

pmm

Enclosures

By electronic filing

c: Mr. David L. Goodin, MDU  
Mr. Robert Rowe, NWPS  
Ms. Judy Proferl, XCEL  
Mr. Linden Evans, Black Hills Corp.

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June 29, 2012

## NOTICE OF FILING

### **Subject: Otter Tail Power Company's Ten Year Biennial Plan - 2012**

Please take notice that on June 29, 2012, Otter Tail Power Company filed its Ten Year Plan with the South Dakota Public Utilities Commission in accordance with ARSD 20:10:21. Pursuant to Section 20:10:21:23 of the South Dakota Public Utilities Commission's Rules Governing Energy Facility Plans, notice of the filing of this plan is given to the following state agencies and officers as designated:

- (1) Aeronautics Commission;
- (2) Department of Agriculture;
- (3) Attorney General;
- (4) Department of Commerce and Regulation;
- (5) Governor's Office of Economic Development;
- (6) Department of Education and Cultural Affairs;
- (7) State Engineer;
- (8) Department of Game, Fish and Parks;
- (9) State Geologist;
- (10) Governor;
- (11) Department of Health;
- (12) Indian Affairs Commission;
- (13) Department of Labor;
- (14) Legislative Research Council;
- (15) Department of Environment and Natural Resources;
- (16) Department of School and Public Lands; and
- (17) Department of Transportation.

Sincerely,

A handwritten signature in cursive script that reads "Kerry Kaseman".

Kerry Kaseman  
Resource Planner

**SOUTH DAKOTA**

**TEN YEAR**

**BIENNIAL PLAN**



**Report RP12-06  
Resource Planning Department  
June 2012**

**By: Kerry Kaseman**

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**INTRODUCTION**

In accordance with the rules and regulations of the South Dakota Public Utilities Commission Energy Facility Plans ARSD 20:10:21, Otter Tail Power Company ("Otter Tail"), hereby files its Biennial Ten Year Plan. This filing is structured to coincide sequentially with the Commission rules as defined in the Form for Plans, ARSD 20:10:21:25 Section 4 through Section 18, therefore, coincide with ARSD 20:10:21:04 to ARSD 20:10:21:18, respectively.

Notice of Filing of the plan is being sent to each of the state agencies and officers designated in Section 23 of the Energy Facility Plans.

## SECTION 4 -- EXISTING ENERGY CONVERSION FACILITIES

### A. Big Stone Plant

1. The Big Stone Plant is located in Grant County, South Dakota, approximately two miles west-northwest of Big Stone City, 1-3/4 miles from Big Stone Lake, and approximately two miles north of U.S. Highway 12. The site is in the central portion of Section 12, Township 121 N, Range 47 W.
2. The turbine-generator was built by Westinghouse and has a nameplate capacity of 414,590 kW at the generator terminals with inlet steam conditions of 2,400 psig, 1000 degrees F, a condenser pressure of 3.25 inches HgA, and 0% makeup.
3. Big Stone Unit #1 has a cruise rating of 475 MWs using the sub-bituminous coal. Net generation for the year 2010 was 3,169,192 MWh, and for 2011 was 2,459,107 MWh.
4. The Big Stone Plant appropriates its entire supply of water from Big Stone Lake. During calendar year 2010, 3,371 acre-feet of water was appropriated, and during 2011, 2,839 acre-feet was appropriated.
5. The Big Stone Plant continued to burn sub-bituminous coal in 2010 and 2011. The amount of sub-bituminous coal burned in 2010 was 2,250,473 tons and 1,968,293 tons in 2011.

Big Stone Plant burned alternative fuels from 1989 to 2009. Deliveries of alternative fuels peaked in the mid to late 90's. After a thorough review of the Big Stone Plant use of alternative fuels, the plant decided to end the program at the end of 2009. Several factors led Big Stone to this decision. Capital repairs were required for the handling facility, primarily new walking floors. Supplies of the various fuels have dwindled, with BSP being the outlet of last resort in many cases. Maintenance costs for routine upkeep remained consistent, even with a lower number of tons moving through the facility. Tire derived fuel continued to create problems in the fuel conditioners, resulting in higher than expected maintenance costs. Finally, new EPA requirements for combusting non-hazardous secondary materials made it difficult to determine which fuels can be burned. The plant intends to mothball the handling system. If other opportunities present themselves in the future, they will be evaluated.

The owners of Big Stone Plant have approved the addition of environmental retrofits to the plant. The plan calls for selective catalytic reduction (SCR) to reduce emissions of nitrogen oxide and a dry-scrubber to reduce sulfur dioxide. Both nitrogen dioxide and sulfur dioxide are expected to be reduced by 80 to 90

percent. Construction will begin in 2013 and the goal is to have the equipment operational in early 2016.

6. Otter Tail does not have a projected date of removal from service for the Big Stone unit.
7. An ethanol plant built adjacent to Big Stone Plant became operational in March 2003. Big Stone Plant provides steam, fire protection, and access to its rail line for transporting the ethanol.
8. Otter Tail has modeled Big Stone Plant emissions to evaluate the impact of plant emissions on Class I air quality areas under the US Environmental Protection Agency's Regional Haze Best Available Retrofit Technology rule. More information can be found under Section 12 of this report.

NOTE: Big Stone Plant is jointly owned by Otter Tail, Montana-Dakota Utilities Co., and Northwestern Public Service. Otter Tail serves as the operating agent for the unit.

#### B. Lake Preston Peaking Plant

1. The Lake Preston Peaking Plant is located in the city of Lake Preston, South Dakota, west of the intersection of 4th Street NW and Preston Street.
2. The generating unit consists of a G.E. frame 5 fuel oil fired combustion turbine connected to an electrical generator with a rated capacity of 23.95 MW at 59 degrees F. ambient temperature.
3. In 2010 the unit had net generation of 903 MWh and -16 MWh in 2011. The negative number indicates that station service to the plant was greater than the generation for the year.
4. Water source does not apply for this unit.
5. In 2010, 140,826 gallons of #2 fuel oil were consumed and in 2011, 26,531 gallons were consumed.
6. Otter Tail does not have a projected date of removal for this unit.

## **SECTION 5 -- PROPOSED ENERGY CONVERSION FACILITIES**

In September 2009, Otter Tail terminated its participation in a proposed second unit at Big Stone Plant near Milbank in Grant County. The project was subsequently cancelled in November 2009.

The Company's 2011-2025 Integrated Resource Plan includes the addition of 50 MW (nameplate) of wind generation in 2012 and up to 250 MW (nameplate) of natural gas-fired simple cycle peaking capacity by 2018. The location of these proposed facilities has not been determined at this time.

## **SECTION 6 -- EXISTING TRANSMISSION FACILITIES**

Otter Tail currently owns four high-voltage transmission line sections in South Dakota described as follows:

1. A section of the Canby-Toronto 115 kV line starting from a point on the South Dakota line in Section 34, Township 114, Range 47, to a substation one mile west of Toronto, a distance of 13.1 miles, all in Deuel County. This is a wood-pole, H-frame line. No date has been projected for the removal of this line.
2. A section of the Big Stone-Gary 230 kV line starting from a point 0.76 miles north of County Road #18 in Section 4, Township 118, Range 47, to a 230 kV substation four miles north of Gary in Section 16, Township 116, Range 47, a distance of 14.96 miles, 5.76 miles in Grant County and 9.2 miles in Deuel County. This is a wood-pole, H-frame line. No date has been projected for the removal of this line.
3. A section of the Big Stone-Hankinson 230 kV line starting at a point on the South Dakota line in Section 26, Township 129, Range 50, to a point 0.3 miles north of the Roberts County Highway #23 in Section 11, Township 127, Range 50, a distance of 22.62 miles, all in Roberts County. This is a wood-pole, H-frame line. No date has been projected for the removal of this line.
4. A 115 kV line from Toronto to Hetland starting at the Toronto Substation in Section 24, Township 113, Range 49 (approximately 1 mile west of Toronto) and continuing generally south and west terminating at the Hetland Substation in Section 28, Township 111, Range 53 (approximately 1 mile east and 1 mile north of Hetland), a total distance of 38.8 miles, with about 3 miles in Deuel County, 32 miles in Brookings County, and 4 miles in Kingsbury County. This is a single pole line composed of both wood and steel structures. No date has been projected for the removal of this line.

## **SECTION 7 -- PROPOSED TRANSMISSION FACILITIES**

### **Northeast South Dakota Transmission Enhancements**

The joint transmission system in northeastern South Dakota and west central Minnesota is in need of upgrades due to load growth in the region. The transmission system in this area serves OTP, Central Power Electric Cooperative, Great River Energy, and East River Electric Power Cooperative customers. The 41.6 kV system serving customers in this area is supported by the following sources: 115 kV transformer at Summit (owned by Western Area Power Administration), a 230 kV transformer at Browns Valley (owned by Otter Tail Power Company), a 230 kV transformer at Hankinson (owned by Central Power Electric Cooperative), and a 115 kV transformer at Graceville (owned by Great River Energy). Load in this area has grown to a level which requires upgrades in this area. Through joint planning efforts among the load serving entities in this area, the preferred transmission plan for supporting the increased load in this area consists of the following projects:

- Replace Summit 115/41.6 kV transformer (increase size from 8 MVA to 25 MVA)
- Install a new 115/69/41.6 kV substation in Roberts County, SD
- Install a new 69/41.6 kV substation near Grenville, SD

OTP is planning to work with WAPA to replace the transformer at Summit. Furthermore, the Roberts County 115/69/41.6 kV substation is expected to be located near Claire City, SD and have joint ownership between WAPA, EREPC, and OTP. The Grenville substation will be a joint project between OTP and EREPC. The first two steps in this transmission plan involve the replacement of the Summit transformer and establishing the new Roberts County substation. The transmission plan under development in this area will require close coordination between WAPA, OTP, and EREPC to ensure appropriate timing for load serving enhancements in this region.

The Summit transformer replacement, Roberts County substation, and Grenville substation are all included within Appendix B of the MISO Transmission Expansion Planning (MTEP) efforts. Once agreements are reached with neighboring utilities, it is anticipated that these projects will move into Appendix A for MISO Board of Director approval possibly as soon as MTEP13 depending on negotiations with neighboring utilities. Details for the Summit transformer are included in MTEP as project 3660, facility 6821 with details of the Roberts County project being included under MTEP project 3659, facility 6820. The Grenville project can be found within MTEP under project 3661, facility's 6822 and 6823.

### **CapX Transmission Initiative: Brookings County – Hampton 345 kV Project**

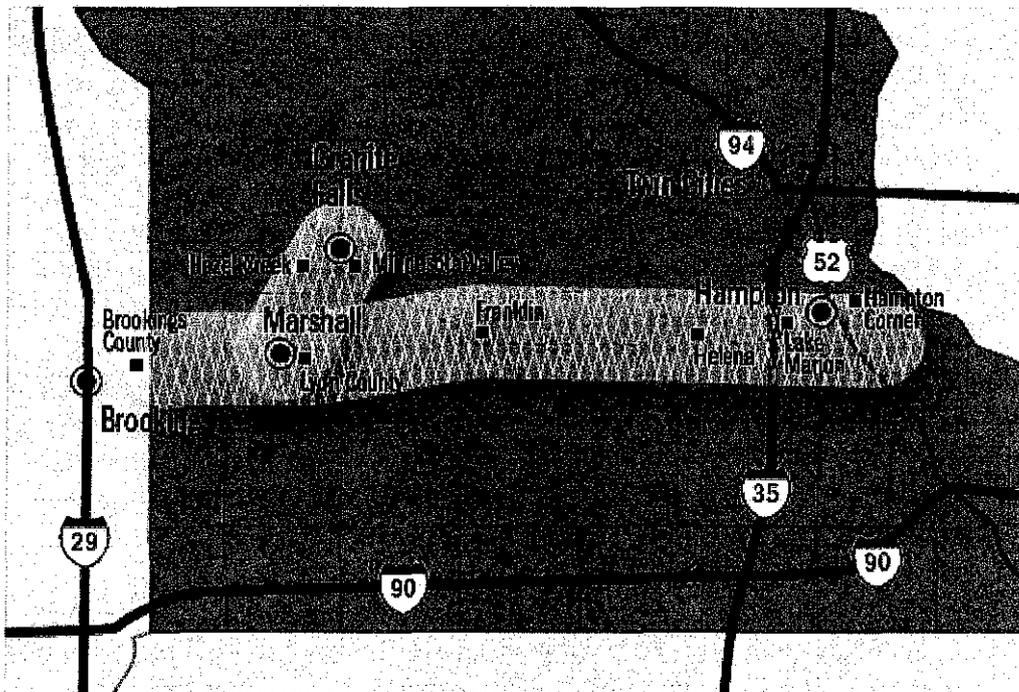
Otter Tail is a participant in the CapX 2020 effort that is currently involved in four different transmission lines referred to as the CapX Group 1 projects. These projects include:

- Brookings County – Hampton 345 kV Line (approximately 200 miles)
- Fargo – Monticello 345 kV Line (approximately 250 miles)
- Hampton – Rochester – LaCrosse 345 kV line (approximately 150 miles)
- Bemidji – Grand Rapids 230 kV Line (approximately 70 miles)

Otter Tail is an owner in the Brookings County – Hampton, Fargo – Monticello, and Bemidji – Grand Rapids projects.

A small portion of one of the initial projects, a proposed 345 kV transmission line from the White, SD area (Brookings County Substation) to the southern Twin Cities area is located in South Dakota and shown in Figure 1. The current schedule for this facility is to have an in-service date in mid-2015. The CapX utilities have obtained all of the necessary permits from the State of Minnesota and the State of South Dakota for the respective portions of the project that reside in each state. Otter Tail will have a 4% ownership share in this transmission project.

**Figure 1 Proposed 345 kV line from White, SD Area to the Twin Cities Area**



**Big Stone – Big Stone South – Brookings 345 kV Project**

As part of the 2011 MISO Transmission Expansion Plan (MTEP11) approval, the MISO Board of Directors endorsed a portfolio of transmission projects across the MISO footprint called the

Multi-Value Projects (MVPs). The MVPs have been identified and recommended to meet public policy requirements within the MISO states through 2026.

The MVP portfolio approved by the MISO Board of Directors includes 18 distinct transmission projects across MISO, with OTP being involved in three of these projects, namely: Brookings – Hampton 345 kV line, Big Stone – Ellendale 345 kV line, and Big Stone – Brookings 345 kV line. The MTEP11 report included a total portfolio cost of these 18 MVPs of approximately \$5.2 Billion.

As mentioned above, two 345 kV projects approved in the 2011 MISO Transmission Expansion Plan (MTEP11) connect in the vicinity of Big Stone, South Dakota, namely Big Stone South – Ellendale 345 kV and Big Stone South – Brookings 345 kV. To facilitate the development of these two MVPs, it is necessary to develop a new 345 kV switchyard near Big Stone. After a review of the existing Big Stone 230/115 kV substation, it has become evident that physical limitations at the site will not allow for an adequate expansion for these future 345 kV terminations and transformers. Therefore, OTP is planning to build a new “Big Stone South” substation approximately 1.5 miles south of the existing Big Stone substation. The new Big Stone South substation and the existing Big Stone substation (i.e. “Big Stone Plant”) are planning to be connected by two 230 kV lines to electrically connect the Big Stone Plant substation to the Big Stone South substation. The Big Stone South substation is planning to include two new 345/230 kV transformers and adequate space for the new 345 kV terminals into and out of the Big Stone area with room for future expansion. The existing Big Stone Plant substation will also require minor modifications to accommodate the additional 230 kV terminations for the new 230 kV lines down to the Big Stone South substation. The new 345 kV lines into and out of the Big Stone area (Ellendale and Brookings) will terminate at the new Big Stone South substation. This configuration was included within the models that were used by MISO in studying the MVPs during MTEP11.

The MVPs being developed in the Big Stone area include three distinct projects, which are Big Stone Plant – Big Stone South 230 kV, Big Stone South – Ellendale 345 kV, and Big Stone South – Brookings 345 kV. The Big Stone Plant – Big Stone South 230 kV portion of the project is viewed as the first critical development in the Big Stone area in order to develop the new 345 kV lines that emanate from Big Stone.

OTP is also working closely with Xcel Energy (XCEL) to develop a new 345 kV MVP transmission project that will run from Big Stone South to Brookings. This project is envisioned to be approximately 65 miles long and terminate at the existing Brookings County substation owned by Xcel Energy. At this time, OTP is planning to own 50% of the project. Major components of the project will involve the 345 kV line itself, as well as a new termination at the Big Stone South substation and the Brookings County substation. The schedule for this project is under development with the in-service date currently anticipated to be in 2017. The Big Stone South – Brookings 345 kV project will help deliver low cost generation resources from western

MISO to other parts of the MISO footprint. Therefore, this project is scheduled to be completed after the Brookings – Hampton 345 kV project.

The 2011 MISO Transmission Expansion Plan (MTEP11) included details about this project by referencing the project under number 2221.

### **Big Stone Area Generation Interconnection Projects**

In late 2009, the Big Stone II project withdrew from the MISO interconnection queue. Even with this withdrawal, there continues to be strong interest in adding generation in the Big Stone area. MISO has studies underway to determine what transmission is necessary to interconnect these projects to the system. To date, initial MISO studies indicated the Big Stone – Granite Falls 345 kV line is common to all transmission plans under study. Other transmission lines under consideration in combination with the Big Stone – Granite Falls 345 kV line include:

- Big Stone – Alexandria 345 kV Line; or
- Big Stone – Toronto 345 kV Line; or
- Big Stone – Brookings 345 kV Line

Approval of Multi-Value Projects in December 2011 has resulted in a substantial change in the assumptions that are used in the on-going interconnection studies at MISO. Otter Tail will continue to monitor the on-going study efforts at MISO in order to determine the optimal transmission plan for new interconnection projects in light of the new MVP transmission.

Otter Tail continues to see a lot of activity within South Dakota related to increased interests in new wind generation development, large load expansions related to the ag-processing industry and energy transport industry (oil pipelines). As these projects are further developed, it is possible that additional transmission will be required. Further study will be required to determine the optimum transmission plan and will be coordinated through local and regional transmission planning processes.

## **SECTION 8 -- COORDINATION OF PLANS**

Otter Tail conducts transmission planning in a coordinated environment, involving neighboring utilities, load serving entities, state regulatory commissions and members of the public to collaborate in the planning process.

### ***Regional Coordination through the MISO Process***

As a transmission-owning member of MISO, Otter Tail participates in various transmission planning efforts, the most significant of which is the annual MISO Transmission Expansion Planning (“MTEP”) process. The MTEP process involves a variety of planning analyses to determine the performance of the transmission system for a wide variety of conditions. Through

the MTEP process, MISO, with input from various stakeholders, evaluates the system for both reliability and economic needs.

Local planning of the Otter Tail facilities less than 100 kV is primarily coordinated on a subregional level. Otter Tail's locally planned projects are then reviewed by MISO and may become part of the MTEP. Developing local transmission plans at a subregional level and rolling them up to MISO provides for regional coordination of local transmission plans, which leads to transmission projects being built in a coordinated manner to address the transmission needs of the larger region. This coordination for identifying new transmission projects also augments the larger region by providing for a transmission plan that maximizes the benefits of the new projects and in many cases reduces the number of new transmission projects that are needed than if transmission planning was done solely on an individual basis. Regional coordination of local transmission plans also results in study efficiencies by keeping a broader group of utilities, states, and stakeholders informed through the transmission planning process.

During the course of the MTEP process, MISO seeks opportunities to coordinate or consolidate, where possible, individually defined transmission projects into more comprehensive cost-effective developments. MISO coordinates with Transmission Owners, and considers the input from various stakeholder groups (through Subregional Planning Meetings, Planning Subcommittee Meetings, and Planning Advisory Committee Meetings) to develop expansion plans to meet the needs of the transmission system. This multi-party collaborative process allows for all projects with regional and inter-regional impacts to be analyzed for their combined effects on the transmission system. Moreover, this collaborative process is designed to ensure the most efficient and cost-effective transmission expansion is developed, while giving consideration to the inputs from all stakeholders.

Additionally, subregional, state, and non-MISO coordination is necessary because the Otter Tail transmission system is highly interconnected with neighboring non-MISO/MAPP transmission owners. The Otter Tail transmission system is nearly the farthest, most western border of the MISO footprint; therefore, it is interconnected with several transmission-owning utilities that are not members of the MISO, but instead remain members of MAPP.

### ***Regional Coordination with non-MISO Transmission Owners***

Otter Tail participates in CapX 2020 (Capacity Expansion by 2020) effort, which is a joint initiative of transmission-owning electric utilities in Minnesota and the surrounding region created on the basis of expanding the electric transmission grid to ensure electric reliability for several years into the future. The CapX 2020 utilities (including cooperatives, municipal utilities and investor-owned utilities) collaboratively assess the current transmission system and plan for the necessary future transmission infrastructure investments. This collaborative process and the planning studies performed as part of this effort are coordinated with the Midwest ISO.

In addition to the CapX 2020 effort, Otter Tail also has Integrated Transmission Agreements (ITA) with Central Power Electric Cooperative, Missouri River Energy Services, Minnkota Power Cooperative, and Great River Energy. These agreements provide for joint use of transmission facilities in common areas of service and require that the utilities jointly plan and coordinate additional facilities required for the common service area. Furthermore, Otter Tail has agreements for joint use of transmission and interconnection with Xcel Energy (formerly Northern States Power), East River Electric Cooperative, Montana-Dakota Utilities Co., Manitoba Hydro, Northwestern Energy, and Western Area Power Administration. These agreements were all precipitated through joint studies and coordination of facilities required to provide high reliability of service at the minimum cost. Facilities proposed and committed through this local process become part of the MTEP and are also coordinated with the MAPP.

### ***Summary of Regional Coordination***

As discussed above, Otter Tail coordinates extensively with its neighboring utilities to share system plans and identify system enhancements through MISO and through local participation in coordinated transmission planning (such as CapX 2020 and the ITAs). Otter Tail's participation in the MISO study process provides coordinated planning for the entire 15-state MISO footprint while participation in various working groups and committees provides for coordinated planning on a subregional basis, which includes both utilities that are MISO members and utilities that are not MISO members.

## **SECTION 9 -- SINGLE REGIONAL PLANS**

The proposed facilities mentioned in Sections 5 and 7 comprise a part of the MISO Transmission Expansion Plan.

## **SECTION 10 -- SUBMISSION OF REGIONAL PLAN**

MISO compiles a MTEP report on an annual basis. The regional planning process within MISO concludes with a final report that is ultimately approved by the MISO Board of Directors. Currently, MTEP12 is underway with MTEP11 being the last approved report available on the Midwest ISO website for public viewing at:

<https://www.midwestiso.org/Library/Repository/Study/MTEP/MTEP11/MTEP11DraftReport.pdf>

## **SECTION 11 -- UTILITY RELATIONSHIPS**

Refer to Section 8 for a listing of the coordinated efforts in which Otter Tail is involved.

As mentioned previously, Otter Tail has Integrated Transmission Agreements (ITA) with several utilities. These agreements provide for joint use of transmission facilities in common areas of service. These agreements require joint studies and coordination of facility additions to provide high reliability of service at the minimum cost. Otter Tail has interconnections and transmission

agreements in South Dakota with the following utilities: Northwestern Energy, Montana-Dakota Utilities Co., East River Electric Cooperative, Missouri River Energy Services, and Western Area Power Administration.

## **SECTION 12 -- EFFORTS TO MINIMIZE ADVERSE EFFECTS**

As reported in the July 2008 and 2010 South Dakota Ten Year Biennial Plan, the Advanced Hybrid™ system was deemed unacceptable for particulate emissions control, and it was replaced with a conventional pulse-jet fabric filter in 2007. The pulse jet fabric filter continues to operate successfully. The Big Stone Plant is currently operating within all presently applicable federal and state air quality and emission standards.

On June 15, 2005 the United States Environmental Protection Agency (EPA) signed the Regional Haze Best Available Retrofit Technology (BART) rule. The rule requires emissions reductions from designated sources that are deemed to contribute to visibility impairment in Class I air quality areas. Modeling was conducted in accordance with a protocol approved by the South Dakota Department of Environment and Natural Resources (DENR). The modeling indicated that the Big Stone Plant contributed to visibility impairment, and was consequently required to install BART controls.

On January 15, 2010, the DENR provided Otter Tail with a copy of South Dakota's draft proposed Regional Haze State Implementation Plan (SIP). South Dakota's draft proposed Regional Haze SIP recommended a dry scrubber to control sulfur dioxide, a fabric filter to control particulate matter emissions, and selective catalytic reduction (SCR) technology for NOx emissions reduction. The DENR public noticed their Regional Haze Program Rule (ARSD Chapter 74:36:21) for a hearing before the South Dakota Board of Minerals and Environment on September 15, 2010 at which time the rule was approved. The DENR submitted the Regional Haze Program Rule and the Regional Haze SIP to EPA for their approval on January 21, 2011.

EPA signed the final rule approving the South Dakota Regional Haze SIP and the Big Stone BART determination on March 29, 2012. The final approval was then published in the Federal Register on April 26, 2012, and became effective on May 29, 2012. Although studies and evaluations are continuing, the current project cost is estimated to be approximately \$490 million (OTP's share would be \$265 million).

By monitoring programs, Otter Tail is able to identify any adverse environmental effects at Big Stone Plant. Although not required to do so by any federal, state, or local governmental bodies, Otter Tail engaged in pre-operational and post-operational air, water, and soil monitoring programs at Big Stone Plant. The purpose of these programs is to provide information to determine any effects of Big Stone Plant on the surrounding environment and to provide an "early warning" system should any of the effects of the plant be adverse.

Condenser cooling at Big Stone is accomplished by using a 340-acre closed-cycle cooling pond. Use of such a pond eliminates any potential problems created by plant thermal discharges to public bodies of water.

In 1980, construction was completed on the \$13.5 million Big Stone Plant wastewater management project, including a brine concentrator. The purpose of the brine concentrator is to remove the accumulated dissolved solids from water recycled in the closed-cycle cooling pond by a process similar to that employed in a distillery. Benefits of the brine concentrator include reduced disposal volume of plant wastewater and improved cooling pond water quality.

Dikes surround oil storage tanks and larger chemical storage facilities to prevent contamination of large areas of soil or water should rupture of a storage tank occur. All underground petroleum storage tanks have been removed and replaced where necessary with above ground storage tanks. All above ground tanks are in compliance with existing requirements of the DENR.

Otter Tail will continue to cooperate with the South Dakota Public Utilities Commission and the DENR in an effort to site and operate future power plants and transmission lines in an environmentally acceptable manner, contingent with the needs of a reliable supply of electrical energy.

### ***Social and Economic Effects***

Social and economic effects are very closely related. In fact, they are often referred to as "socioeconomic" effects. Because of their close relationship, the socioeconomic effects will be discussed jointly.

From experience gained in past construction projects, such as Big Stone Plant, and Coyote Station located near Beulah, North Dakota, Otter Tail has been made aware of the socioeconomic effects of large construction projects. Pre-construction and post-construction socioeconomic monitoring was conducted in the vicinity of Big Stone in order to evaluate the effect of a large construction force on such things as the business community, housing, and essential services such as hospital and dental care. This type of monitoring was also employed in conjunction with the construction of Coyote Station. Socioeconomic effects were evaluated as part of the Big Stone II Energy Conversion Facility Site Permit application process. Otter Tail agreed to implement the recommendations of the Local Review Committee if construction of Big Stone II had proceeded.

In order to aid the economy in the area of construction, it has been Otter Tail's policy to utilize the local labor force and local contractors as much as possible. Local contractors also provide essential services during plant operations.

### ***Health Effects***

Various governmental regulations, including, for example, primary and secondary ambient air quality standards and water quality standards, have been promulgated to protect the public health and welfare. Otter Tail will comply with these regulations. In addition, Otter Tail contributes to organizations, such as the Edison Electric Institute, which work to identify potential health and environmental problems as they relate to the electric utility industry.

### ***Public Safety***

Otter Tail is very concerned about public safety. All readily accessible substations and major plant sites are fenced to prevent unescorted access by the public who might be unfamiliar with electric energy or associated generation facilities.

In addition, Otter Tail complies with all applicable construction codes for the construction of electrical transmission lines and generation facilities.

Otter Tail also inspects its facilities periodically to help safeguard against failures of vital components and prevent any unnecessary exposure to the general public. Included in the inspections are electric transmission lines, circuit breakers, capacitors, and transformers.

### ***Historic or Aesthetic Preservation Effects***

A Programmatic Agreement (PA) had been developed for the proposed Big Stone II Project and Big Stone Transmission in accordance with the stipulations of Section 106 of the National Historic Preservation Act. It was developed by Western Area power Administration and was completed after consultation with the Minnesota and South Dakota State Historic Preservation Officers (SHPO), the Big Stone II Co-owners, interested tribes, cooperating agencies, and other interested parties. Mitigation measures as well as stipulations outlined in the PA were intended to eliminate or minimize adverse affects to cultural resources.

The PA outlined the steps to be taken to identify cultural resources and to: evaluate them to determine eligibility for listing on the National Register of Historic Places (NRHP); identify potential adverse effects; to develop measures to avoid, reduce or mitigate adverse effects; and address inadvertent discoveries of cultural and paleontological resources. It also assigned roles and responsibilities for implementation of the PA, which ensured that all interested parties are involved in decisions regarding the treatment of historic and traditional cultural properties (TCPs) that would have been affected by the proposed Project.

Aesthetic effects have been considered in the design of transmission lines and power plants and will be considered in the design of future facilities. Transmission line routing considerations include visual effect on surrounding terrain. The design of Big Stone Plant included the choice of a color scheme that would blend with the surrounding countryside.

## SECTION 13 -- EFFORTS RELATING TO LOAD MANAGEMENT

The main objective of the Otter Tail's "Load Management System" is to turn off a variety of selected customer loads at times when our system is experiencing peak or near peak loads. This system has allowed Otter Tail to delay the need for the addition of new generating facilities and to permit the power system to be more efficiently operated.

Otter Tail began the development of a load management program and control system in September of 1975. The Company investigated and tested several control systems and, in 1980, started the installation of the FM Radio Load Management System. In 1992 the new PC Based Automated Control System was completed. Over a 4 year period from 2003 to the summer of 2007, Otter Tail replaced all of our load management equipment. This included over 40,000 radio receivers on customer's premises along with software and hardware to allow the secondary use of the office to truck and truck to truck voice radio system for load management transmissions.

The update of the radio load management system was necessary since our existing system was based on over 20 year old technology and thus difficult to find replacement receivers. We had also experienced a continued reduction in the overall effectiveness of the system, thus a reduction in the total megawatts of controlled load.

Control of residential central air conditioners is now possible since the new system has the ability to cycle loads automatically in short duration (15 minutes on, 15 minutes off, .....). Otter Tail continues to promote this new program in order to increase the number of air conditioners available for summer control. Total controlled air conditioner installations as of the first of May 2012 include 865 across the Otter Tail system with 56 of these installed by our customers in South Dakota.

The load management system replacement has improved the amount of controllable load and thus given us the confidence in the system needed to accredit this load modifying resource with Midwest ISO as of June 1, 2010.

Winter season manageable loads are in several categories and can reach as high as 130 MW. These tariffs include electric water heaters, thermal storage, RDCs (residential demand controllers), commercial time of use, small dual fuel heating systems, and large dual fuel (industrial and bulk interruptible loads).

The radio load management system also has the capability of interrupting as high as 30 MW of summer peak load. These summer loads consists primarily of water heaters, irrigation, the large dual fuel industrials and residential air conditioning.

Total installations of the load management system include 40,850 radio receivers on the Otter Tail system with 3,982 of these radio receivers located on our customer's premises in the state of

South Dakota.

Otter Tail has registered its load management system with the Midwest ISO as a Demand Response Resource. The Midwest ISO has certified Otter Tail's load management system for 110 MW during the winter season and 30 MW during the summer season.

#### **SECTION 14 -- LIST OF REPORTS**

Otter Tail is not aware of any reports or studies filed or proposed to be filed with federal or other state agencies relating to proposed energy conversion or transmission facilities other than those required for the transmission projects noted above in section 7.

#### **SECTION 15 -- CHANGES IN STATUS AT FACILITIES**

There is no change in the Big Stone Plant status. The unit continues to be operated as a base-loaded unit for Otter Tail system load. Lake Preston continues to be operated during peak demands and line stability conditions.

#### **SECTION 16 -- PROJECTED ELECTRIC DEMAND**

For the 2011 winter season, Otter Tail had an unmanaged system peak of 838 MW on January 19, 2012 for the hour ending at 8 p.m. The projected unmanaged winter season demand for the Otter Tail system is shown in Table 1. Winter data reflects the MISO planning year in which the winter season begins in November of the listed year and extends through April of the following year.

**Table 1 Projected Unmanaged Winter Season Peak Demand<sup>1</sup> for Otter Tail System**

<b>Year</b>	<b>Unmanaged Peaks (MW)</b>
2012	804
2013	815
2014	822
2015	830
2016	839
2017	850
2018	861
2019	872
2020	892
2021	912

<sup>1</sup> Peak values are prior to new conservation program impacts.

Table 2 shows the projected unmanaged winter season peak demand for the South Dakota portion of Otter Tail's system. Again, in Table 2, winter data reflects the Midwest ISO planning year in which the winter season begins in November of the listed year and extends through April of the following year.

Because the South Dakota portion of the Otter Tail system demand is not metered, Table 2 unmanaged peak demand was estimated by applying the ratio of projected South Dakota energy sales and projected system energy sales to projected system peak demand.

**Table 2 Projected Unmanaged Winter Season Peak Demand<sup>1</sup> for SD Portion of Otter Tail System**

Year	Unmanaged Peaks (MW)
2012	74.8
2013	75.0
2014	74.0
2015	73.9
2016	75.5
2017	77.4
2018	79.2
2019	80.2
2020	82.1
2021	83.9

<sup>1</sup> Peak values are prior to new conservation program impacts.

Otter Tail has registered its load management system with the Midwest ISO as a Demand Response Resource. The Midwest ISO has certified Otter Tail's load management system for 110 MW during the winter season and 30 MW during the summer season.

As a company, Otter Tail will continue to use a combination of load management and purchase agreements with other utilities to meet any future deficits. Otter Tail also continues to study and assess the potential for future additions to its generation resources.

Otter Tail has purchased summer and winter season peaking capacity for the year 2012. The Company has a capacity purchase contract with Wisconsin Electric Power Company totaling 50 MW from June 1, 2011 through May 31, 2013. Otter Tail also has a capacity purchase contract with Great River Energy totaling 50 MW from December 1, 2010 through December 31, 2014 and another contract totaling 100 MW from January 1, 2015 through May 31, 2017. Further

detailed information may be obtained from Otter Tail's Resource Plan documents that are filed with the Minnesota Public Utilities Commission. The Company's current Resource Plan was filed June 25, 2010.

**SECTION 17 -- CHANGES IN ELECTRIC ENERGY**

The projected increase of winter season unmanaged peak demand for Otter Tail's system and South Dakota is shown in Table 3.

**Table 3 Projected Increase of Winter Season Unmanaged Peak Demand<sup>1</sup> for Otter Tail System and South Dakota Portion**

Year	System Load Increase (MW)	System Percent Increase	South Dakota Load Increase (Decrease) (MW)	South Dakota Percent Increase (Decrease)
2013	11	1.4%	0.2	0.3%
2014	7	0.9%	(1.0)	(1.3%)
2015	8	1.0%	(0.1)	0%
2016	9	1.1%	1.6	2.2%
2017	11	1.3%	1.9	2.5%
2018	11	1.3%	1.8	2.3%
2019	11	1.3%	1.0	1.3%
2020	20	2.3%	1.9	2.4%
2021	20	2.2%	1.8	2.2%

<sup>1</sup> Load values are prior to new conservation program impacts.

**SECTION 18 -- MAP OF SERVICE AREA**

A map of the Otter Tail service area is shown in Figure 2 below.

**Figure 2 Otter Tail Service Area**

