

**SOUTH DAKOTA PUBLIC UTILITIES COMMISSION**

**CASE NO. EL05-022**

**IN THE MATTER OF THE APPLICATION BY OTTER TAIL POWER COMPANY**

**ON BEHALF OF THE BIG STONE II CO-OWNERS**

**FOR AN ENERGY CONVERSION FACILITY SITING PERMIT FOR THE**

**CONSTRUCTION OF THE BIG STONE II PROJECT**

**DIRECT TESTIMONY**

**OF**

**WARD UGGERUD**

**SENIOR VICE PRESIDENT**

**OTTER TAIL POWER COMPANY**

**MARCH 15, 2006**



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**TESTIMONY OF WARD UGGERUD**

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1           **BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION**

2                           **DIRECT TESTIMONY OF WARD UGGERUD**

3   **I.       INTRODUCTION**

4   **Q:       State your name and business address.**

5   A:       My name is Ward Uggerud. 215 South Cascade St., Fergus Falls, Minnesota.

6   **Q:       By whom are you employed and in what capacity?**

7   A:       I am Senior Vice President for Otter Tail Power Company ("Otter Tail").

8   **Q:       What is your educational background?**

9   A:       I am an electrical engineering graduate from North Dakota State University  
10 (1971).

11 **Q:       What is your employment history?**

12 A:       My employment background with Otter Tail is as follows: From 1971 – 1974 I  
13 was an engineer in Computer Services working on engineering software applications for  
14 our System Operations function. From 1974 – 1978 I was an engineer in our System  
15 Engineering Department working on transmission, substation and protective relaying  
16 activities. From 1979-1988 I was the manager of the System Operations Department.  
17 From 1988 to the present I have been an Executive Officer of the electric utility  
18 supervising our Generation, Environmental Engineering and Wholesale marketing  
19 activities. I am currently Senior Vice President for Otter Tail Power Company. During  
20 my career with Otter Tail I have served in various positions with the Mid-Continent Area  
21 Power Pool (MAPP) and with the North American Electric Reliability Council (NERC),

1 including having served as the Chairman of the Operating Committees of both  
 2 organizations.

3 **Q: What work experience have you had that is relevant to your testimony?**

4 A: My job is, and always has been, to provide electricity as reliably and  
 5 economically as possible to our customers while at the same time operating within all  
 6 regulatory and legal standards. All of my work experience is relevant to my testimony.  
 7 My work experience has made me keenly aware of the interaction of the relationship  
 8 between the supply and demand of electricity. I've been able to observe first hand the  
 9 functioning of the market and I understand the causes of price volatility. I've remained  
 10 close to our customers and know directly their concern about the price of electricity. I've  
 11 been involved in negotiations for new agri-processing industrial development where  
 12 decisions are made based on tenths of a cent per KWhr of electric cost differentials. As  
 13 chairman of the NERC Operating Committee, I helped develop reliability standards and  
 14 monitoring protocols to insure compliance with them. I was directly involved in  
 15 discussions with the committees of jurisdiction when the Clean Air Act Amendments of  
 16 1990 and the National Energy Policy Act of 1992 were passed. All of my experiences  
 17 have prepared me to represent that Otter Tail Power Company's participation in the Big  
 18 Stone Unit II power plant has been thoughtfully developed and is consistent with rule,  
 19 regulation and our customers' expectations.

20 **Q: What classes and other training have you taken relating to your testimony?**

21 A: The relevant training I have had relating to my testimony has been almost  
 22 exclusively on-the-job training. It is my work experience and the accountability of my

1 performance in my job that has prepared me to say what I say. In my responsibilities as  
 2 Senior Vice President, I have had to become knowledgeable and familiar with the laws  
 3 and regulations that govern our industry. I have had the requirement to become familiar  
 4 with contracts and legal relationships. I've had to learn the intricacies of the relationships  
 5 among stakeholders, customers, shareholders, employees, regulators, legislators,  
 6 suppliers, vendors, but most certainly, customers first. No business survives without first  
 7 and foremost serving its customers. And I believe I know our customers. Otter Tail  
 8 serves a rural, sparsely populated service territory and I grew up in the northern reaches  
 9 of it. My dad and brother still farm the family farm and I know first hand the economic  
 10 struggle our customers face to provide for themselves, their families and their customers.  
 11 I know first hand their concern about the price of all of their inputs and I understand the  
 12 relationship between each component of the cost and reliability of the electricity our  
 13 company provides to our customers.

14 **Q: Have you submitted testimony in other judicial proceedings dealing with**  
 15 **energy and related issues?**

16 A: I have submitted testimony in numerous proceedings involving electric supply  
 17 issues for the company. This includes having provided testimony in company rate cases  
 18 for previous generation projects and in judicial proceedings involving contested issues for  
 19 fuel and freight contractual issues. I have provided testimony before the United States  
 20 Congress involving rail transportation issues and electricity policy issues. In addition to  
 21 testimony provided in the above-mentioned proceedings, I have also spoken widely on  
 22 the matter of interconnected utility operations throughout the United States and Canada.

1 Also, I have been responsible for the development of a demand-side management  
2 technology that holds both United States and international patents.

3 **II. PURPOSE AND SUMMARY OF TESTIMONY**

4 **Q: Describe the purpose of your testimony.**

5 A: The purpose of my testimony is to provide general information about Otter Tail,  
6 Otter Tail's need for additional baseload resources to meet its customers' forecasted  
7 power and energy requirements in the years ahead, Otter Tail's consideration of  
8 alternative sources of power and energy to meet those requirements, the company's  
9 decision to participate in the Big Stone Unit II project, and on the background work that  
10 has been done in arriving at the company's decision to pursue Big Stone Unit II.

11 **III. OTTER TAIL**

12 **Q: Please describe your company.**

13 A: Otter Tail is an investor-owned electric utility headquartered in Fergus Falls,  
14 Minnesota. Otter Tail was founded in 1907 in Fergus Falls. Initially, the company  
15 generated and distributed only hydroelectric power from dams it owned and operated on  
16 the Otter Tail River in and near Fergus Falls. Over time, Otter Tail added additional  
17 generating resources and expanded its service territory to rural areas and small towns and  
18 municipalities in Minnesota, North Dakota and South Dakota. Today, Otter Tail provides  
19 electricity and energy services to more than 128,000 customers in western Minnesota,  
20 eastern North Dakota and northeastern South Dakota. Otter Tail's service territory is  
21 approximately 50,000 square miles and includes service to 423 communities. The  
22 company's electric load is predominantly rural and only three towns have a population of

1 10,000 or more, with no town having a population exceeding 20,000. Over half of the  
 2 communities Otter Tail serves have a population of less than 200 people.

3 Otter Tail has a historical peak load obligation, including reserve requirements, of  
 4 772 MWs and in 2005 had total retail sales of 3,894,435 MWhrs. Otter Tail has  
 5 company-owned generation resources of 699 MWs and provides the rest of its required  
 6 capacity from purchases from other utilities. In 2005, company-owned resources  
 7 provided 3,513,705 MWhrs of generation. Otter Tail is the operating agent for the Big  
 8 Stone Unit I generation facility owned jointly by Otter Tail, Northwestern Energy and  
 9 Montana Dakota Utilities Company. Otter Tail is also the operating agent for the Coyote  
 10 generation facility that is jointly owned by Otter Tail, Northwestern Energy, Montana  
 11 Dakota Utilities Company and the Northern Municipal Power Agency.

12 Otter Tail owns 5,294 miles of transmission facilities of 41.6 kV and above. Otter  
 13 Tail is a balancing authority of the Midwest Reliability Organization of the North  
 14 American Electric Reliability Council. Otter Tail is a member of the Midwest  
 15 Independent System Operator and the Mid-Continent Area Power Pool.

16 **Q: Describe the governance structure of your company.**

17 A: Otter Tail is a division of Otter Tail Corporation - an investor-owned company  
 18 with diversified interests that include an electric utility, plastics, manufacturing, health  
 19 services, food ingredient processing and other businesses. The electric utility does  
 20 business under the name of Otter Tail Power Company, providing electrical service to  
 21 customers in Minnesota, North Dakota and South Dakota, but is not a separate legal  
 22 entity from Otter Tail Corporation. Otter Tail Corporation does not have any parent

1 companies and no publicly held corporation has a ten percent or greater ownership  
2 interest in Otter Tail Corporation.

3 **IV. OTTER TAIL'S DETERMINATION OF NEED FOR ADDITIONAL**  
4 **POWER AND ENERGY, ITS CONSIDERATION OF ALTERNATIVES**  
5 **AND ITS DECISION TO PARTICIPATE IN THE BIG STONE UNIT II**  
6 **PROJECT**

7 **Q: What general factors did the company consider in determining there was a**  
8 **need for additional power and energy to meet the requirements of the company's**  
9 **customers?**

10 A: Otter Tail took into consideration the load requirements of our retail customers  
11 and the alternative cost of serving that load using a variety of different resource options.  
12 A significant factor in Otter Tail's expansion plan is the fact that pool surpluses that have  
13 been instrumental in keeping electricity costs down over the past years are going away  
14 and will be replaced by deficits. Further, the resource additions of the past 20 years or so  
15 have been predominantly gas fired generators and the combination of the forecasted  
16 deficits along with the high cost of producing electricity from gas and oil have been  
17 important factors in our consideration of the optimum resource expansion requirements  
18 going forward.

19 **Q: Is the purpose of your testimony to explain in detail what Otter Tail's load**  
20 **requirements will be, and explain how it expects to meet those requirements?**

21 A: No. Bryan Morlock will provide that information in detail. My role is to explain  
22 from the perspective of Otter Tail's senior management the overall process that led to the  
23 determination that Otter Tail needed significant amount of additional baseload generating



1 capacity in the year 2011 and beyond. In addition, my role is to explain the overall  
 2 process and the general reasoning employed by Otter Tail to participate in the Big Stone  
 3 Unit II project.

4 **Q: What general factors did Otter Tail consider in determining that it needed to**  
 5 **add new base load capacity in the year 2011?**

6 A: The first and paramount factor was the fact that Otter Tail's customers live and  
 7 operate businesses in rural areas and in small towns and cities. The company's  
 8 residential customers live on relatively modest incomes and, by and large, do not have the  
 9 economic means to absorb unnecessary rate increases. Thus, the first factor considered  
 10 was the necessity of maintaining affordable rates. At the same time, Otter Tail's  
 11 customers generally lack alternative sources of reliable power and energy. Some of Otter  
 12 Tail's customers can afford back-up power sources, like portable generators. However,  
 13 for all but a very small percentage of Otter Tail's customers, Otter Tail is their only  
 14 source of power and energy. If Otter Tail fails in its obligations to maintain a sufficient  
 15 supply of reliable and affordable power and energy, the first to suffer from the company's  
 16 failure to maintain adequate supply resources will be Otter Tail's customers.

17 **Q: Please explain your answer.**

18 A: At the risk of oversimplifying a very complex issue, the fact is that Otter Tail is  
 19 subject to the same risks of rolling blackouts and brownouts that the state of California  
 20 experienced several years ago. There are a multitude of factors that contribute to power  
 21 shortages, some of which are more controllable than others. One of the factors that  
 22 electric utilities like Otter Tail can control is to plan to meet projected electrical loads

1 (net of reductions by demand side management measures) by building or contracting for  
 2 assured supply-side resources that will be sufficient to meet the projected power and  
 3 energy demands of Otter Tail's customers.

4 Otter Tail is continually engaged in the process of load and capability forecasting  
 5 and planning. Otter Tail is required to file Integrated Resource Plans with two state  
 6 regulatory commissions, and files forecasts on a frequent periodic basis with MAPP and  
 7 MISO. For many years, MAPP's load and capability forecasts for the MAPP region have  
 8 shown significant capacity shortages in the year 2011. MAPP's forecasts indicate  
 9 substantial region-wide shortages of power in the year 2011. Otter Tail's own forecasts  
 10 for that timeframe also show significant capacity shortages. The coincidence of predicted  
 11 company-specific shortages and MAPP regional shortages in that time period make it  
 12 evident that Otter Tail cannot rely solely on long-term power purchase contracts or spot  
 13 market purchases to meet the projected capacity shortages. Instead, the forecasts  
 14 illuminate the fact that the region requires the construction of more generating capacity,  
 15 along with sufficient new transmission capacity to interconnect with and provide an  
 16 outlet for the power and energy from the new generation resources. Because of the  
 17 necessity to deliver affordable power and energy in a way that is environmentally sound,  
 18 prudent load and capability forecasting and planning also entail determining a rational  
 19 mix of resource and fuel types. Otter Tail routinely evaluates its system needs for  
 20 baseload, intermediate and peaking generation resources.

21 The company also takes seriously its legal and social obligations to mitigate the  
 22 environmental effects of producing, transmitting and distributing electric power and

1 energy. Before Otter Tail makes any commitment to add new supply-side resources, the  
 2 company's managers, engineers and planners carefully evaluate whether the resource  
 3 type is appropriate (baseload, intermediate or peaking), whether the fuel source is  
 4 appropriate (e.g., renewable or non-renewable), and whether the generation technology is  
 5 appropriate (e.g., pulverized coal versus IGCC). Otter Tail's Power Company's business  
 6 strategy of providing the lowest cost resources to its retail electric customers can only be  
 7 accomplished by having the right mix of resources in order to provide the energy required  
 8 by those customers.

9       Following the last round of area generation expansion in the late 1970s and early  
 10 1980s, there has been, for the most part, an imbalance between supply and demand such  
 11 that purchasing electricity from others has been an economical way to serve customer  
 12 load. The base load generation resources added since Sherburne County Unit # 3  
 13 (installed in 1987) have predominately been natural gas fired peaking plants. Peaking  
 14 plants are available to serve load at times of highest demand but generally have not been  
 15 needed to provide energy on an around-the-clock basis to serve the baseload requirements  
 16 of customers. As loads have grown, and as natural gas prices have shown increasing  
 17 price volatility, participation in base load electric generation projects has become an  
 18 increasingly important part of the strategy to maintain electricity prices as low as possible  
 19 while still maintaining the requisite reliability of service.

20       Otter Tail's need is based on a combination of load growth coupled with the  
 21 expiration of long-term power purchase agreements that cannot be renewed at  
 22 economically favorable levels under terms acceptable to both the buyer and the seller.

1 Otter Tail is both capacity and energy deficient and the selection of the lowest cost base  
 2 load resource is critical to being able to provide customers with the lowest cost and most  
 3 stable rates going forward. The bedrock and driving factors behind Otter Tail's planning  
 4 decisions, however, must always remain the paramount requirements of reliability and  
 5 affordability.

6 **Q: Did Otter Tail conclude that participating in Big Stone Unit II was the best**  
 7 **alternative for meeting Otter Tail's projected capacity needs?**

8 A: Yes. The lowest cost option selected, the Big Stone Unit II project, was  
 9 determined by computer simulations as part of the company's integrated resource  
 10 planning requirements. In that analysis, the lowest cost option was chosen from among a  
 11 mix of alternative sources of supply that included an assortment of renewable and  
 12 traditional generation resources. A comparative cost of the Big Stone Unit II option has  
 13 been compared with other alternatives on various occasions for many years.

14 **Q: What percentage of the output of Big Stone Unit II has your company**  
 15 **contractually committed?**

16 A: Otter Tail is currently enrolled for 116 MWs of the proposed 600 MW project, or  
 17 19.33%.

18 **Q: How is Otter Tail going to pay its share of the construction and operating**  
 19 **costs of the proposed Big Stone Unit II?**

20 A: Otter Tail currently expects to fund their its entire participation with a  
 21 construction loan, structured to meet the obligation of a "binding financial obligation."

1 Total project funding requirements for Otter Tail are estimated at \$230 million based on  
 2 the current estimate of project costs.

3 Otter Tail is expected to borrow construction funds on an as-needed basis through  
 4 plant construction at relatively short-term interest rates. The construction loan is  
 5 expected to be replaced with permanent funding consisting of approximately 50% long-  
 6 term debt and 50% equity. Otter Tail expects that debt raised for the project will be on an  
 7 unsecured basis.

8 **Q: What benefits do you see Big Stone Unit II affording your company's**  
 9 **customers?**

10 A: Big Stone Unit II will provide the lowest cost, most reliable source of electricity  
 11 for Otter Tail's customers. In fact, it is that requirement and the analysis of all  
 12 alternatives that led the company to the selection of this resource expansion option.

13 **Q: What alternatives exist to Big Stone Unit II for your customers in the**  
 14 **timeframe beginning in 2011?**

15 A: Alternatives to the Big Stone Unit II project include purchases of capacity and  
 16 energy from other entities or the construction of alternative generation projects.  
 17 Specifically included in the list of other self-generation options are natural gas fired  
 18 peaking or intermediate units, various renewable generation alternatives such as wind and  
 19 biomass, and other coal fired projects that would be located in locations other than at the  
 20 Big Stone plant. Nuclear generation and Integrated Gas Combined Cycle (IGCC) failed  
 21 our screening analysis because of the cost and advanced lead time requirements for  
 22 nuclear, and due to the significant uncertainty over the commercial feasibility of IGCC by

1 2011. While IGCC may be a viable technology for plants further in the future, our  
 2 analysis shows that it is a experimental technology under development and that reliance  
 3 on a yet-to-be-demonstrated technology would expose our customers and our investors to  
 4 an unacceptable level of risk. The company's current resource expansion plans also call  
 5 for the addition of significant amounts of renewable resources prior to the completion of  
 6 Big Stone Unit II, the likely installation of another combustion turbine peaking plant in  
 7 2013, and a significant expansion of our demand-side management and conservation  
 8 activity.

9 **Q: Describe the other important factors that led to Otter Tail's involvement**  
 10 **with Big Stone Unit II?**

11 A: Otter Tail's analysis of our generation resource requirements indicates a need for  
 12 base load generation resources in the time frame associated with Big Stone Unit II. Our  
 13 analysis of the various available options leads to the conclusion that this project provides  
 14 the lowest cost resource expansion plan possible. Further, the development of Big Stone  
 15 Unit II can be accomplished in such a way as to improve the drought tolerance of Big  
 16 Stone Unit I while at the same time resulting in lower overall total emission of regulated  
 17 air pollutants from the combined site with two operating units as compared to that of the  
 18 current single unit. The location of the Big Stone site also leads to an expansion  
 19 alternative that minimizes the transmission outlet requirements as compared to all other  
 20 sites. Furthermore, the proposed transmission expansion plan associated with the Big  
 21 Stone Unit II project will likely facilitate the interconnection of increased amounts of  
 22 renewable wind generation projects.

1 **Q: Please explain what you mean when you say the development of Big Stone**  
 2 **Unit II can be accomplished in such a way as to improve the drought tolerance of**  
 3 **Big Stone Unit I.**

4 A: The availability and suitability of cooling water has been limiting the efficiency of  
 5 Big Stone since shortly after its construction in 1975. Cooling water is pumped into the  
 6 plant storage ponds generally in the spring and fall. It is not the amount of water  
 7 available from Big Stone Lake that is the limiting factor for Big Stone, rather it is the  
 8 quality and amount of water stored on the site. In a drought condition, the annual make-  
 9 up water could be reduced to the point where the water stored on site might not be  
 10 sufficient to provide adequate cooling. The original water balance design simply did not  
 11 provide for the optimal long-term operation of a zero discharge generation plant. The  
 12 construction of Big Stone Unit II provides an opportunity to correct some of the design  
 13 limitations at Big Stone Unit I. The result will be that Big Stone Unit I should be able to  
 14 operate more successfully even in years when the annual make-up water pumped in from  
 15 Big Stone Lake might be reduced because of drought conditions.

16 **Q: Please explain how the transmission expansion plan associated with Big**  
 17 **Stone Unit II will facilitate the interconnection of increased amounts of power and**  
 18 **energy to be produced by renewable wind generation projects.**

19 A: The transmission plan associated with Big Stone Unit II has been designed to  
 20 accommodate a substantial amount of additional generation. In conducting the  
 21 transmission plan development for Big Stone Unit II, one of the obvious factors was that  
 22 the transmission outlet occurs in the vicinity of one of the country's most optimum wind

1 development areas. For this very reason, the transmission planning was done to  
2 determine the relationship between incremental transmission along the plant outlet path  
3 and the ability of that incremental transmission to handle additional amounts of  
4 generation output. One of the discreet elements of transmission design is the operational  
5 voltage, and studies revealed that spending additional money to increase the voltage level  
6 of the southern outlet line, which generally runs through the Buffalo Ridge area, would  
7 provide for approximately 1000 MW of additional generation output capability, once  
8 interconnected with other planned facilities. While the rules of transmission  
9 comparability as established by the Federal Energy Regulatory Commission do not allow  
10 the project to earmark this increment for any party's specific use, it is available on a non-  
11 discriminatory basis to parties upon request that seek and need transmission along the  
12 path of the outlet line. Transmission limitations are well known among alternative and  
13 renewable energy developers and the Big Stone Unit II transmission outlet design  
14 provides a significant amount of transmission that will be available to others.

15 **Q: Does this conclude your testimony?**

16 **A:** Yes.