

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

TERRY GRAUMANN

MANAGER OF ENVIRONMENTAL SERVICES

OTTER TAIL POWER COMPANY

MARCH 15, 2006



TESTIMONY OF TERRY GRAUMANN

TABLE OF CONTENTS

1

2

3 I. INTRODUCTION1

4 II. PURPOSE AND SUMMARY OF TESTIMONY2

5 III. BIG STONE UNIT II CONSTRUCTION APPROVALS3

6 IV. FEDERAL ENVIRONMENTAL IMPACT STATEMENT4

7 V. EIS DEVELOPMENT6

8 VI. PSD AIR QUALITY CONSTRUCTION PERMIT9

9 VII. CONTROL EQUIPMENT.....10

10 VIII. WATER APPROPRIATION PERMIT13

11 IX. SOLID WASTE ISSUES.....15

12 X. RADIOACTIVE WASTE ISSUES20

13 XI. LOCAL REGULATION20

1 **BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION**
2 **DIRECT TESTIMONY OF TERRY GRAUMANN**

3 **I. INTRODUCTION**

4 **Q: Please state your name and business address.**

5 A: My name is Terry Graumann, 215 S. Cascade St., Fergus Fall, Minnesota.

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

7 A: I am the Manager of Environmental Services for Otter Tail Power Company. As
8 Manager of Environmental Services, my responsibility is to ensure that Otter Tail Power
9 Company's obligations and commitments to preserve the natural environment are fulfilled in a
10 cost-effective manner while achieving and maintaining compliance with all applicable regulatory
11 requirements. My role on the Big Stone Unit II Project Team is to manage the acquisition of all
12 of the necessary environmental permits for construction of the Big Stone Unit II project
13 including the Energy Conversion Facility Siting Permit.

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

15 A: I graduated in 1972 from Tabor College, Hillsboro, Kansas with a Bachelor of Arts
16 Degree in Natural Sciences.

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

18 A: I began my employment with Otter Tail Power Company in 1973 providing
19 environmental compliance support in Otter Tail's Power Production Department. My ongoing
20 responsibilities included review and implementation of environmental regulations, development
21 of compliance strategies, data collection and developing permit applications. I was responsible
22 for the development and timely submittal of an application for Certificate of Site Compatibility

1 that was filed with the North Dakota Public Service Commission in 1976 for Coyote Station. I
 2 was given additional responsibilities in 1978 as the Supervisor of Environmental Engineering. In
 3 1994, I was named department manager, which is my current role. During my tenure, I have
 4 personally completed or supervised numerous permit applications and permit renewals in the
 5 areas of air quality, solid waste, and water quality including ongoing permitting for the existing
 6 Big Stone Plant.

7 **Q: What professional organizations do you belong to?**

8 A: I am a member of the Air and Waste Management Association and serve as Otter Tail
 9 Power Company's representative to the Partners Advisory Committee of the Energy and
 10 Environmental Research Center's Center for Air Toxic Metals. I also serve as Otter Tail's
 11 representative to the North Dakota Lignite Energy Council's Mercury Task Force. The Task
 12 Force consists of lignite energy representatives who have been given the responsibility to
 13 oversee mercury emissions reduction research and development projects. Over \$13 million of
 14 DOE/industry jointly funded projects are in various stages of completion.

15 **Q: What classes or other training have you taken relating to [your subject matter]?**

16 A: I have attended numerous workshops and training sessions that were sponsored by EPRI,
 17 EEI, state and federal regulatory agencies, and industry affiliated groups. Topics included Clean
 18 Air Act compliance, continuous emissions monitoring, hazardous waste management, oil spill
 19 prevention control and countermeasure plan requirements, water discharge compliance and solid
 20 waste management.

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

22 **Q: What is the purpose of your testimony?**

1 A: The purpose of my testimony is to identify the various permits that will be required for
 2 Big Stone Unit II and to describe the permitting and approval processes that are required in
 3 addition to this process relating to an Energy Conversion Facility Siting Permit.

4 **Q: Please summarize your testimony.**

5 A: In my testimony I describe the procedure that is being followed by the Western Area
 6 Power Administration to complete an Environmental Impact Statement on the project. I also
 7 describe the control equipment and measures (a wet scrubber, a baghouse filter, selective
 8 catalytic reduction technology) that will be employed to control emissions of pollutants from the
 9 Big Stone Plant and comply with PSD (Prevention of Significant Deterioration) requirements. I
 10 describe the Big Stone request for a Water Appropriation Permit to pump water from Big Stone
 11 Lake. I also address the matter of solid waste and describe how combustion waste such as
 12 bottom ash will be disposed of in any existing landfill onsite and other waste will be hauled
 13 offsite for disposal. No radioactive waste will be disposed of onsite. Finally, I describe some
 14 local regulations that Big Stone Unit II will comply with.

15 **III. BIG STONE UNIT II CONSTRUCTION APPROVALS**

16 **Q: What permits will be required for the construction of Big Stone Unit II?**

17 A: For purposes of Big Stone Unit II, there are five major permits or other governmental
 18 authorizations that are required: the PSD Air Quality Construction Permit, the Water
 19 Appropriations Permit, the Solid Waste Disposal Permit, the Federal Environmental Impact
 20 Statement, and the Energy Conversion Facility Siting Permit, which is the subject of this hearing.
 21 There are a number of other permits and authorizations that will be required, including the Corps
 22 of Engineer's Section 404 permit for dredging and filling in wetlands and local zoning or other
 23 approvals.

1 **Q: You mentioned acquisition of permits as one of your responsibilities. Do you have**
2 **other responsibilities with regard to permitting?**

3 A: Yes I do.

4 **Q: What other responsibilities with regard to permitting do you have?**

5 A: Most often, permits include conditions that must be met in order to remain in compliance
6 with the permit. Permit conditions include monitoring and periodic reporting, and recordkeeping
7 requirements. In addition, there are numerous statutes and rules that must be complied with even
8 though their requirements are not embodied in a permit. It is my responsibility to ensure that
9 Otter Tail complies with all of its permit obligations as well as the requirements imposed by
10 statute or rule.

11 **Q: Will the transmission lines require a separate permit and approval?**

12 A: Yes they will. The Applicants submitted an application to the South Dakota Public
13 Utilities Commission in January 2006 for a route permit for two transmission lines in South
14 Dakota that would interconnect the Plant to the transmission system.

15 **IV. FEDERAL ENVIRONMENTAL IMPACT STATEMENT**

16 **Q: Is a Federal EIS being prepared on the Big Stone Unit II Project?**

17 A: Yes. The Western Area Power Administration is preparing an Environmental Impact
18 Statement on the entire project. The Rural Utilities Services (RUS) and the Army Corps of
19 Engineers are cooperating agencies in the EIS process.

20 **Q: Why does the Big Stone Unit II Project require a Federal EIS?**

21 A: The Western Area Power Administration has determined pursuant to Section 102(2)(C)
22 of the National Environmental Policy Act (NEPA) and guidelines established by the Council of
23 Environmental Quality (40 C.F.R. ch. 1508) that the project involves a major federal action

1 significantly affecting the quality of the human environment. Actions are also required by the
 2 Rural Utilities Service and by the Army Corps of Engineers.

3 **Q: What is the Western Area Power Administration?**

4 A: Western is a Federal power-marketing agency under the U.S. Department of Energy that
 5 sells and delivers Federal electric power to municipalities, public utilities, Federal and state
 6 agencies, and Native American tribes in 15 western and central states. Western's Open Access
 7 Transmission Service Tariff provides open access to entities such as Missouri River Energy
 8 Services and Heartland Consumers Power District to supply power to their customer load areas.
 9 Western provides these services through an interconnection if there is available capacity in the
 10 transmission system.

11 **Q: What is the Western Area Power Administration's action with regard to Big Stone?**

12 A: Western's action is to decide if the proposed Project can be interconnected with
 13 Western's transmission system at its Morris and Granite Falls substations. MRES and Heartland,
 14 on behalf of the Applicants, have applied to interconnect the proposed Project to Western's
 15 power transmission system at the existing Morris and Granite Falls substations. The proposed
 16 Big Stone Unit II Project would incorporate a major new generation resource into Western's
 17 power transmission system and would require upgrades to existing substations on Western's
 18 system and the construction of new transmission lines in the region. According to DOE's NEPA
 19 Implementing Procedures, this action requires that an EIS be prepared for the project.

20 **Q: What is the Rural Utilities Service's action?**

21 A: The Electric Program of Rural Utilities Service (RUS) makes loans to corporations,
 22 states, territories, and subdivisions and agencies such as municipalities, people's utility districts,
 23 and cooperative, nonprofit, limited-dividend, or mutual associations that provide retail electric

1 service needs to rural areas or supply the power needs of distribution borrowers in rural areas.
 2 Great River Energy (GRE), which is one of the seven project Applicants, has applied to the RUS
 3 for a loan to finance its portion of the proposed project. The EIS must meet the RUS
 4 requirements for environmental review of the project before RUS can provide funding to GRE.

5 **Q: What is the Corps of Engineer's Federal action?**

6 A: The U.S. Army Corps of Engineers (USACE) is a regulatory agency with responsibilities
 7 over waters of the U.S. One of the major responsibilities of the USACE is administering the
 8 wetlands permitting program under Section 404 of the Clean Water Act if a project involves
 9 deposition of dredge or fill material into waters of the U.S. The USACE has agreed to
 10 participate in the EIS process because the Applicants will have to cross navigable waters and
 11 impact wetlands or other waters of the U.S.

12 **V. EIS DEVELOPMENT**

13 **Q: How did Western proceed with developing the EIS?**

14 A: Western selected a third-party environmental contractor to help Western develop the EIS.
 15 Western selected a company called ENSR to fill the role of the third party environmental
 16 contractor.

17 **Q: Did the Applicants provide information to address issues examined in the EIS?**

18 A: ENSR used the information that Barr Engineering Company gathered for the Energy
 19 Conversion Siting Permit Application for the plant portion of the EIS. That information was
 20 reviewed for accuracy and supplemented as necessary. ENSR also used the information that
 21 HDR gathered for the Minnesota and South Dakota transmission line route permit processes for
 22 the transmission line portion of the EIS.

1 **Q: Are comments and suggestions from the public and other state and Federal agencies**
 2 **considered in developing an EIS?**

3 A: Yes they are.

4 **Q: How is that done?**

5 A: The National Environmental Policy Act requires the lead agency, in this case Western, to
 6 ask other Federal, state, and local agencies, affected Indian tribes, the project Applicants, and
 7 other interested persons to participate in the EIS scoping process. The purpose of the scoping
 8 process is to determine the scope and the significant issues that require in-depth evaluation in the
 9 EIS. It is also designed to identify and eliminate the issues that are insignificant.

10 **Q: How were all of these agencies and the public notified of the opportunity to**
 11 **participate in the EIS scoping?**

12 A: As the lead Federal agency Western was required to publish a notice of its intent to
 13 develop an EIS in the Federal Register, which was done on May 27th, 2005. The notice
 14 identified the dates and locations of EIS scoping meetings. Western mailed scoping meeting
 15 notices directly to Federal and state agencies and Native American Tribes that have the authority
 16 or specialization regarding an environmental impact that could potentially occur as a result of the
 17 proposed project. The agencies and tribes were also encouraged to attend the scoping meetings
 18 and provide their input to the project. Western also placed display advertisements in 14
 19 newspapers in the Big Stone Unit II project area.

20 **Q: How long was the scoping period?**

21 A: The scoping period was from May 27th to August 29th, 2005.

22 **Q: Where and when were scoping meetings held?**

1 A: Scoping meetings were held in Milbank, South Dakota, Morris, Minnesota, and Granite
 2 Falls, Minnesota, on June 14th, 15th and 16th, 2005, respectively. I attended all three of these
 3 scoping meetings.

4 **Q: Approximately how many people attended the scoping meetings?**

5 A: A total of 34 non-project people attended the meetings.

6 **Q: How could members of the public register comments with Western on the scope of**
 7 **the EIS?**

8 A: The public had an opportunity to make statements at the scoping meetings. In addition,
 9 Western provided an opportunity for the public to submit statements and comments in writing,
 10 via cards that were made available at the meetings, in letter or note form, or via e-mail.

11 **Q: Who collected the comments?**

12 A: Western collected and logged the comments.

13 **Q: Approximately how many comments were received?**

14 A: Western reported that it received a total of 445 scoping comments, several hundred of
 15 which were form letters.

16 **Q: What is done with the comments and questions that are raised in the scoping**
 17 **process?**

18 A: Western compiled all comments received during the entire scoping period into a scoping
 19 report document. The comments were also incorporated into the EIS analyses.

20 **Q: What type of information will be contained in the EIS?**

21 A: The EIS will describe the purpose and need for the project and the purpose and need for
 22 agency action. The EIS will also describe the project and alternatives to the project, including
 23 the no action alternative. Information describing the existing environment – the status of the

1 current conditions of the project area – will also be included. Further, the EIS will provide an
 2 assessment of the environmental consequences of moving forward with the project.

3 **Q: What is the schedule for the EIS process?**

4 A: The draft EIS is currently under development. It is scheduled for release and comment in
 5 draft form via notice in the Federal Register on April 14, 2006, although a public version should
 6 be made available on approximately April 6th or 7th. There will be a 45-day public comment
 7 period. Following close of the public comment period, Western will incorporate the public
 8 comments into the final EIS. At that time, Western will issue a Record of Decision and
 9 announce the availability of the Final EIS. The Record of Decision is targeted for November 2,
 10 2006.

11 **VI. PSD AIR QUALITY CONSTRUCTION PERMIT**

12 **Q: David Gaige has described in his testimony the PSD program. Have you reviewed**
 13 **Mr. Gaige's testimony?**

14 A: Yes.

15 **Q: Do you agree with his testimony regarding the PSD program?**

16 A: Yes.

17 **Q: Have the Applicants filed an application with the South Dakota Department of**
 18 **Environment and Natural Resources for PSD review?**

19 A: Yes, we filed an application on July 20, 2005, with the DENR Air Quality Program.

20 **Q: Is that application complete?**

21 A: Yes it is. I received a letter dated August 9, 2005, from Mr. Kyrik Rombough of the
 22 DENR acknowledging that the application was deemed complete.

1 **Q: Is the PSD permit the only air quality permit that is necessary for operation of Big**
 2 **Stone Unit II**

3 A: No it is not. An application for an Operating Permit must be submitted to the DENR
 4 within 12 months of commencing operation as per ARSD 74:36:05:08.

5 **VII. CONTROL EQUIPMENT**

6 **Q: Please describe the control equipment that has been selected to control SO₂**
 7 **emissions from the Big Stone Plant.**

8 A: Big Stone I co-owners and the Big Stone Unit II Applicants have agreed to install a joint,
 9 common wet flue gas desulfurization system (wet scrubber) that would reduce sulfur dioxide
 10 emissions from both Big Stone I and Big Stone II. There are advantages for both Big Stone I and
 11 Big Stone II with a common wet scrubber arrangement. Big Stone I is able to reduce its sulfur
 12 dioxide emissions at a somewhat lower capital cost as compared to installing a separate scrubber
 13 at a later date. The Big Stone I co-owners are able to market or bank their SO₂ allowances and
 14 those allowances have value. Labor and maintenance costs are expected to be lower with one
 15 scrubber as compared to two scrubbers, which is an advantage to both Big Stone I and Big Stone
 16 II. Big Stone II has the advantage of a more streamlined permitting process by agreeing to cap
 17 plant site sulfur dioxide emissions at historical levels.

18 **Q: Please describe the plans for controlling emissions of nitrogen oxides from the Big**
 19 **Stone Plant.**

20 A: The Big Stone Unit II supercritical boiler would use burners that produce low levels of
 21 nitrogen oxides. In addition, a selective catalytic reduction (SCR) nitrogen oxides emission
 22 control technology will be installed. When ammonia is added to the SCR, nitrogen oxides are
 23 reduced to elemental nitrogen on the surface of the catalyst. Consequently, Big Stone Unit II

1 will have very low levels of nitrogen oxides emissions. Big Stone I has an over-fire air system
 2 for controlling its nitrogen oxides emissions. Plans are to further reduce Big Stone I's nitrogen
 3 oxides emissions by more aggressive operation of Big Stone I's over-fire air system so that the
 4 sum total of the Big Stone I and Big Stone II nitrogen oxides emissions are equal to or less than
 5 Big Stone I's historical nitrogen oxide emissions.

6 **Q: Would it be reasonable to install an SCR that is common to both Big Stone I and Big**
 7 **Stone II?**

8 A: No it would not. The technology does not lend itself to a shared application.

9 **Q: Have the Big Stone I co-owners developed a cost estimate for installing an SCR on**
 10 **Big Stone I?**

11 A: Yes they have.

12 **Q: What is that estimate?**

13 A: Approximately \$100 to \$110 million dollars.

14 **Q: Please describe the control equipment that will be installed to control emissions of**
 15 **particulate matter.**

16 A: A pulse-jet fabric filter (PJFF) will control particulate emissions. In a PJFF, the flue gas
 17 flows through from the outside of the bag to the inside and then up the center of the bag where it
 18 exits the PJFF.

19 **Q: What are the Big Stone Applicants doing to control emissions of mercury?**

20 A: The Applicants have decided to install a fabric filter followed by a wet flue gas
 21 desulfurization system (wet scrubber) which will remove a portion of the mercury in the exhaust
 22 gases from the boiler. In addition, the scrubber will remove mercury and sulfur dioxide
 23 emissions from both Unit I and Unit II. A wet scrubber has not been commonly used on low

1 sulfur coals such as subbituminous coal. It offers a higher sulfur removal efficiency and,
 2 according to EPA, a fabric filter followed by a wet scrubber will exhibit greater mercury removal
 3 than other conventional control configurations when firing subbituminous coal.

4 **Q: Are you familiar with the federal Clean Air Mercury Rule (CAMR)?**

5 A: Yes I am. I have also read the testimony of David Gaige.

6 **Q: How will South Dakota achieve compliance with its mercury allotment?**

7 A: In its present form, the Clean Air Mercury Rule grants the state of South Dakota a
 8 mercury budget of 144 pounds (0.072 tons) of mercury emissions per year beginning in 2010. In
 9 2018 and thereafter, South Dakota's mercury budget is reduced to 58 pounds. Under the CAMR
 10 cap and trade provisions, the state of South Dakota would allocate its mercury budget to those
 11 South Dakota units that are regulated under the CAMR Mercury Budget Trading Program. The
 12 budgeted mercury allocations are commonly called allowances. One mercury allowance will
 13 authorize an emission source to emit one ounce of mercury. The allowances can be bought, sold,
 14 traded or banked for future use under the CAMR cap and trade provisions.

15 **Q: How will the Big Stone Applicants obtain reductions in mercury emissions?**

16 A: The Big Stone Applicants will be required to either reduce emissions to the level of
 17 mercury allowances allocated to Unit 1 and Unit 2 or obtain allowances under the cap-and-trade
 18 program from other dischargers who are eliminating or reducing their mercury emissions. The
 19 Big Stone Applicants can commit to doing whatever is required to assure that mercury emissions
 20 from the Plant are in conformance with state and federal requirements. It is the Applicants' goal
 21 to reduce mercury emission to at least the 144-pound allocation level to avoid purchase of
 22 additional allowances. We are uncertain if that goal can be reached given the performance
 23 variability of mercury emission control measures. If the 2010 goal were reached, it would

1 represent an average of 80% reduction in emissions for both Unit I and Unit II based on annual
 2 coal consumption of 5,000,000 tons per year with a mercury concentration in the coal of 0.072
 3 ppm.

4 **Q: Are any of the project Applicants participating in any research projects that would**
 5 **help identify mercury emission reduction technologies?**

6 A: Several of the Applicants are participating in mercury emission reduction technology
 7 research projects through such entities as the North Dakota Lignite Energy Research Council, the
 8 Energy and Environmental Research Center, and EPRI. Much of the research has been
 9 conducted on facilities that some of the Applicants own and operate. In addition, the Applicants
 10 made a financial contribution that enabled mercury emission reduction testing to proceed on a
 11 subbituminous-fired W.A. Parish 8 unit that is equipped with emissions control equipment
 12 similar to what is proposed for Big Stone Unit II. The on-site testing has been completed and the
 13 test report is being compiled. Preliminary findings are encouraging.

14 **Q: How would you summarize the Applicants' approach to mercury emissions**
 15 **reduction?**

16 A: It is our opinion that a combination of a fabric filter and a wet scrubber is the best
 17 demonstrated commercially available mercury emissions reduction technology that can form the
 18 basis for further reductions as identified by on-going research.

19 **VIII. WATER APPROPRIATION PERMIT**

20 **Q: Do the Big Stone I co-owners currently have a Permit to Appropriate Water from**
 21 **Big Stone Lake?**

22 A: Yes they do.

23 **Q: How much water does that permit authorize the Applicants to appropriate?**

1 A: 8,000 acre-feet per year.

2 **Q: Will the Big Stone Unit II Applicants require an increase in the amount of water**
 3 **that will be appropriated?**

4 Yes. The appropriation request is to increase the allowable appropriation by 10,000 acre-feet per
 5 year for a total of 18,000 acre-feet per year. We are proposing that the remaining permit
 6 conditions with respect to allowable pumping rates and seasonal limits remain unchanged. The
 7 Application for a Permit to Appropriate Water reflects the revised site water needs and site
 8 storage volume of 18,800 acre-feet. The Applicants estimate that the annual usage will average
 9 approximately 11,700 acre feet.

10 **Q: Is the 18,000 acre-feet per year the amount that was included in the Application for**
 11 **a South Dakota Energy Conversion Facility Siting Permit.**

12 A: No it is not. The figure in the Siting Permit Application is 15,300 acre-feet.

13 **Q: Why has the appropriation amount increased?**

14 A: The plant was in the preliminary design stage when the permit application was being
 15 prepared in mid-2005. At that time, we had a preliminary plant site water balance and that
 16 information was reviewed and refined as the design progressed.

17 **Q: Is the entire increase from 8000 acre-feet per year to 18,000 acre-feet per year due**
 18 **entirely to Big Stone Unit II?**

19 A: No it is not. There are two factors that contribute to the increase other than the addition
 20 of Big Stone Unit II. First of all, the additional storage volume will provide a measure of
 21 additional drought protection for Big Stone that is currently not available. The existing
 22 appropriations permit has a seasonal pumping volume and a seasonal limit that would remain
 23 unchanged. What this means is that there are occasions when the permit allows little if any

1 pumping from Big Stone Lake. The additional on-site storage would enable the plant to operate
2 during periods when pumping from the lake is not permitted.

3 Second, scrubbing the Big Stone I flue gas will require an additional 450 to 500 acre-feet of
4 water per year.

5 **Q: Has an application for a new water appropriation permit been filed with a**
6 **regulatory agency?**

7 A: I expect that an application will be filed by March 17, 2006.

8 **Q: With which agency was it filed?**

9 A: It will be filed with the South Dakota Department of Environment and Natural Resources
10 Water Rights Program.

11 **Q: Are you preparing the Water Appropriations Permit application?**

12 A: No I am not.

13 **Q: Who prepared the application?**

14 A: Barr Engineering is completing the permit application and water resource modeling with
15 support from Black & Veatch, and Otter Tail Power Company. Burns & McDonnell provided
16 the site water balance and storage pond design. Barr Engineering will be presenting testimony
17 with respect to water resource availability. The DENR Water Rights Program will review the
18 design of the storage ponds in their approval process.

19 **IX. SOLID WASTE ISSUES**

20 **Q: Were you involved in evaluating the solid waste issues with respect to the proposed**
21 **Big Stone Unit II?**

22 A: Yes I was.

23 **Q: Please describe your involvement.**

1 A: Section 2.2.7 of the permit application describes the Big Stone Unit II waste management
 2 activities. Burns & McDonnell prepared that section of the application which I reviewed to
 3 ensure its accuracy and consistency with waste management regulatory requirements. I was also
 4 involved in the recommendation to the Project Applicants for the air emissions control
 5 equipment technology. The type of air emissions control technology impacts the chemical
 6 characteristics of the combustion by-products that are captured.

7 **Q: What solid waste will be generated during operation of Big Stone Unit II?**

8 A: Big Stone Unit II will produce the combustion by-products of bottom ash, fly ash and
 9 gypsum. Plant construction and operation will generate solid waste such as plastics, cardboard,
 10 wood scrapes, food waste, scrap metal and miscellaneous trash and office waste.

11 **Q: What do the Applicants plan to do with the combustion by-products?**

12 A: It is our desire to market as much of the combustion by-products as possible, but what
 13 cannot be sold or utilized will be a waste material and have to be disposed of. We expect to
 14 market a significant portion of the fly ash as a replacement for Portland Cement in concrete
 15 mixtures. Gypsum could be used as a feedstock in the manufacture of sheetrock and wallboard.
 16 However, the gypsum market may be difficult to develop because of the wallboard industry
 17 feedstock requirements and the distance to viable markets. Gypsum is also used as a soil
 18 amendment. The materials that cannot be sold or used will be disposed of in a landfill on the Big
 19 Stone site.

20 **Q: What do the Applicants intend to do with the other solid waste?**

21 A: Plans are to have a private contractor transport that waste to an approved solid waste
 22 landfill, treatment facility, or to a recycling facility located offsite.

1 **Q: What landfill do the Applicants intend to use to dispose of the combustion by-**
2 **products that cannot be sold or otherwise used?**

3 A: An agreement has been reached between the Big Stone I co-owners and the Big Stone
4 Unit II Applicants to allow Big Stone Unit II to dispose of its combustion by-products in the
5 existing Big Stone I landfill in exchange for Big Stone Unit II sharing in the development costs
6 in a future, new landfill when the existing landfill has been filled to capacity.

7 **Q: Is the existing Big Stone landfill permitted by South Dakota?**

8 A: Yes, the South Dakota Department of Environment and Natural Resources issued a
9 Permit to Operate a Solid Waste Facility on October 7, 1974. Subsequent permit renewals were
10 applied for and received at various intervals dictated by the permit term, which varied anywhere
11 from one year to five years. The latest renewal was granted on November 26, 2002, and the
12 present permit expires on November 26, 2007

13 **Q: Does the existing Big Stone I permit as currently crafted allow Big Stone Unit II to**
14 **dispose of its coal combustion by-product in the existing landfill?**

15 A: No it does not.

16 **Q: Have you applied for authorization to dispose of waste from Big Stone Unit II?**

17 A: Yes we have. DENR staff were consulted about how to address the disposal needs of Big
18 Stone Unit II given the plans for disposal of the combustion by-products in the existing landfill.
19 Staff suggested that Big Stone I submit an application for renewal of its existing Big Stone I
20 permit early since the existing permit would, in any event, expire in November of 2007. The
21 renewal application was submitted on October 12, 2005.

22 **Q: What materials were included in the renewal application?**

1 A: The renewal application essentially added Big Stone Unit II coal combustion by-products
 2 to the list of materials proposed for disposal in the existing Big Stone I landfill. Although there
 3 would be some chemical and physical combustion by product differences due to the difference in
 4 combustion technology between Big Stone I and Big Stone II, from a general perspective, the
 5 materials that would be landfilled are similar. Both units will use Powder River Basin coal that
 6 will produce fly ash and bottom ash or slag. Gypsum will be a new material that will be
 7 produced in the wet scrubber that is common to both units. A second brine concentrator will be
 8 added to treat wastewater. The wastewater will either be discharged to the existing brine
 9 concentrator sludge pond, which is included in the solid waste disposal permit, or it will be
 10 converted into a lower moisture material in a crystallizer. The existing solid waste permit allows
 11 disposal of the brine concentrator solids in the ash disposal site. In summary, Big Stone Unit II
 12 will generate more of what is currently produced by Big Stone I.

13 **Q: Does the permit renewal process provide opportunity for public comment and a**
 14 **public hearing?**

15 A: Yes it does. The DENR provides a 30-day public notice prior to issuing a permit.

16 **Q: Has the DENR ever held a public hearing at the time of any of the solid waste site**
 17 **permit renewals and if so please generally describe the hearing and its outcome?**

18 A: An individual intervened in the 1993 permit renewal process. The intervention led to a
 19 public hearing before the Board of Minerals and Environment on November 18, 1993 in
 20 Milbank. The permit was reissued on the basis of the hearing Findings of Fact, Conclusions of
 21 Law and Final Decisions.

22 **Q: What is the expected life of the existing landfill?**

1 A: Otter Tail Power Company provided Burns & McDonnell with Otter Tail's estimate of
 2 the expected remaining landfill capacity at the time Big Stone Unit II would began operation.
 3 Based on average coal characteristics and the anticipated level of operation of both units, we
 4 expect the life of the existing landfill to be at least 10 years after Big Stone Unit II begins
 5 operation. That estimate assumes that no combustion by-products from either unit are utilized
 6 for off-site beneficial purposes. Even under those assumptions, additional landfill space is not
 7 expected to be needed until at least 2021.

8 **Q: Has a location of a new landfill been determined?**

9 A: There are no specific plans for the location and development of a new landfill at this
 10 time. Any new future landfill would be located, designed and operated in compliance with the
 11 regulatory requirements in existence at the time the facility is permitted.

12 **Q: Will the proposed Big Stone Unit II comply with all federal, state and local**
 13 **standards and regulations relating to solid waste once it is constructed and operating?**

14 A: Yes it will.

15 **Q: Will any hazardous waste be generated?**

16 A: The generation of hazardous waste would be minimized wherever possible. The
 17 Applicants will determine whether any waste that are generated during construction or operation
 18 of the Big Stone Plant are hazardous and advise the proper authorities of the existence of any
 19 hazardous waste. Licensed contractors would truck any quantities that are not recyclable or
 20 reclaimable to approved treatment or disposal facilities in accordance with all applicable
 21 requirements, including the obligation to prepare manifests for each shipment of hazardous
 22 waste.

1 **X. RADIOACTIVE WASTE ISSUES**

2 **Q: Were you involved in evaluating whether or not Big Stone Unit II would generate**
 3 **any regulated radioactive waste?**

4 A: Yes I was.

5 **Q: Please describe your involvement.**

6 A: I considered whether or not Big Stone Unit II would generate radioactive waste based on
 7 my experiences with Otter Tail's existing coal-fired plants and the expectations for Big Stone
 8 Unit II. It is likely that Big Stone Unit II would use sealed radioactive sources to monitor certain
 9 process conditions such as coal flow and the wet scrubber slurry density. Existing power plants
 10 have used these types of devices for years. They were included in the original design of Big
 11 Stone Plant. The U. S. Nuclear Regulatory Commission regulates the installation and operation
 12 of such sources.

13 **Q: What becomes of these devices when they have to be replaced?**

14 A: The Nuclear Regulatory Commission regulates the maintenance, repair, replacement and
 15 disposal of sealed sources containing radioactive materials. Disposal is limited to NRC-
 16 approved facilities. No radioactive waste will be disposed of onsite.

17 **Q: Will the proposed Big Stone Unit II comply with all federal, state and local**
 18 **standards and regulations relating to radioactive waste once it is constructed and**
 19 **operating?**

20 A: Yes it would.

21 **XI. LOCAL REGULATION**

22 **Q: Will Big Stone Unit II require local permits and approvals?**

23 A: Yes it will.

1 **Q: Does Grant County require any zoning approvals of the Project?**

2 A: Based on my personal discussion with the Grant County Planning and Zoning Officer, the
3 construction of the Big Stone Unit II plant would require that a portion of the plant site be
4 rezoned from agricultural to industrial use. The area requiring rezoning is the general area of the
5 makeup water storage pond. The request for rezoning would first be heard in a public hearing
6 before the Grant County Planning and Zoning Board followed by a hearing before the Grant
7 County Commission. There is also a possibility of one joint hearing before the Board and the
8 Commission.

9 **Q: Are you aware of any local zoning restrictions that would prevent the necessary**
10 **zoning change?**

11 A: I am not aware of any restrictions or limitations.

12 **Q: Are you aware of any other local permits and approvals?**

13 A: The Project would need a building permit from Grant County. I was informed by Grant
14 County officials that there is no need for a conditional use permit as long as the site is zoned for
15 industrial use.

16 **Q: Will the Project meet the local zoning and building permit requirements?**

17 A: Yes it will.

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

19 A: Yes.