

THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION BY  
 OTTER TAIL POWER COMPANY ON BEHALF OF  
 BIG STONE II CO-OWNERS FOR AN ENERGY EL05-022  
 CONVERSION FACILITY PERMIT FOR THE  
 CONSTRUCTION OF THE BIG STONE II PROJECT

Transcript of Proceedings  
 Volume 3  
 June 28, 2006

COMMISSION STAFF

JOHN SMITH  
 KAREN CREMER  
 GREG RISLOV

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APPEARANCES (continued on next page)

THOMAS J. WELK and CHRISTOPHER W. MADSEN  
 BOYCE, GREENFIELD, PASHBY & WELK  
 Attorneys at Law, P.O. Box 5015,  
 Sioux Falls, South Dakota 57117,  
 appearing on behalf of Big Stone II;

TODD J. GUERRERO and DAVID L. SASSEVILLE,  
 LINDQUIST & VENNUM, Attorneys at Law,  
 80 South Eighth Street, 4200 IDS Center,  
 Minneapolis, Minnesota 55402,  
 appearing on behalf of Big Stone II;

PETER GLASER,  
 TROUTMAN SANDERS LLP, Attorneys at Law,  
 401 Ninth Street NW, Suite 1000,  
 Washington, D.C. 20004,  
 appearing on behalf of Big Stone II;

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## 1 APPEARANCES (cont.)

2 ELIZABETH GOODPASTER,

3 Attorney at Law, Minnesota Center for  
4 Environmental Advocacy, 26 East Exchange Street #206,  
5 St. Paul, Minnesota 55101,  
6 appearing on behalf of Minnesota Center for  
7 Environmental Advocacy, Izaak Walton League of  
8 America - Midwest Office, Minnesotans for an Energy  
9 Efficient Economy and Union of Concerned Scientists;

10 MICHAEL D. O'NEILL,

11 JOHNSON, PROVO, PETERSEN, LLP, Attorneys at Law,  
12 332 Minnesota Street, First National Bank  
13 Building, Suite West 975, St. Paul, Minnesota 55101,  
14 appearing on behalf of Minnesota Center for  
15 Environmental Advocacy, Izaak Walton League of  
16 America - Midwest Office, Minnesotans for an Energy  
17 Efficient Economy and Union of Concerned Scientists;

18 JOHN DAVIDSON JR.,

19 Attorney at Law, USD School of Law, 414 East Clark  
20 Street, Vermillion, South Dakota 57069,  
21 appearing on behalf of Minnesota Center for  
22 Environmental Advocacy, Izaak Walton League of  
23 America - Midwest Office, Minnesotans for an Energy  
24 Efficient Economy and Union of Concerned Scientists;

25 MARY JO STUEVE,

196 East 6th Street #401, Sioux Falls,  
South Dakota 57104,  
appearing pro se.

Reported by Carla A. Bachand, RMR, CRR

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1 WEDNESDAY, JUNE 28, 2006

2 MR. SMITH: Good morning, everyone. Today is  
3 Wednesday, June 27 -- 28th, excuse me. It is 8:30 in the  
4 morning and we are reconvening the hearing in EL05-002,  
5 application of Otter Tail Power and other entities for a permit  
6 to construct the Big Stone II electric generating station in  
7 Big Stone city, South Dakota. Where we left off yesterday, we  
8 were still in the midst of applicants' case-in-chief. At the  
9 close of yesterday's session, we decided that the first thing  
10 this morning we would take telephonically the testimony of  
11 David Gaige, who is one of applicants' expert witnesses. And  
12 at this point in time, I will permit applicants to proceed with  
13 their case and call Mr. Gaige.

14 MR. SASSEVILLE: Thank you. The applicants call David  
15 Gaige telephonically.

16 THE WITNESS: Yes, good morning.

17 MR. SASSEVILLE: Good morning, Mr. Gaige. This is  
18 David Sasseville.

19 THE WITNESS: Good morning.

20 MR. SASSEVILLE: You need to be sworn by the court  
21 reporter.

22 Thereupon,

23 CHARLES DAVID GAIGE,  
24 called as a witness, being first duly sworn as hereinafter  
25 certified, testified as follows:

1 MR. SMITH: Mr. Gaige, this is John Smith, the  
2 commission's counsel, and I just want to let you know and make  
3 sure you are aware, then, that by appearing here telephonically  
4 and taking the oath, that you become subject to this state's  
5 jurisdiction in terms of the administration of that oath and  
6 the enforcement of it. Do you understand that?

7 THE WITNESS: Yes, I understand it.

8 MR. SMITH: Thank you.

9 DIRECT EXAMINATION

10 BY MR. SASSEVILLE:

11 Q. Could you state and spell your full name, Mr. Gaige?

12 A. My full name is Charles David Gaige, C-H-A-R-L-E-S,  
13 D-A-V-I-D, and the last name, Gaige, is G-A-I-G-E.

14 Q. Mr. Gaige, you are the senior project manager,  
15 environmental studies and permitting with Burns & McDonnell  
16 engineering company?

17 A. Yes, that's correct.

18 Q. Did you prepare or cause to be prepared prefiled  
19 direct testimony in this proceeding?

20 A. Yes, I did.

21 Q. And do you have a copy of what has been premarked as  
22 Applicants' Exhibit 22 in front of you?

23 A. Yes, I do.

24 Q. Is that the prefiled direct testimony that you either  
25 prepared or caused to be prepared?

1 A. Yes, it is.

2 Q. If I were to ask you each of the questions set forth  
3 in Applicants' Exhibit 22 this morning, would your answers be  
4 the same as set forth in the prefiled testimony?

5 A. Yes, they would.

6 MR. SASSEVILLE: At this time the applicants would  
7 offer for admission into the record Applicants' Exhibit 22.

8 MR. SMITH: Is there any objection?

9 MR. O'NEILL: No objection.

10 MS. STUEVE: No objection.

11 MR. SMITH: Hearing no objections, Applicants' Exhibit  
12 22 is received into evidence.

13 EXHIBITS:

14 (Applicants' Exhibit No. 22 received into evidence.)

15 Q. (BY MR. SASSEVILLE) Thank you. We are running a  
16 little late getting the hard copies of your summary, but we do  
17 have your summary on the screen so that people can follow  
18 along, so at this time would you present your summary starting  
19 with your credentials, your experience in the profession and  
20 your educational background.

21 A. All right. I've been working in the field for  
22 approximately 30 years. I have a bachelor's degree in  
23 mechanical engineering and a master's degree in mechanical  
24 engineering and began my career working for a state agency  
25 doing some permit review and then I left the state to get my



1 master's degree and have worked in the consulting field  
2 supporting applications and environmental documents since that  
3 time. I was involved in one of the first BACT applications for  
4 a power plant in Wyoming, the Laramie River Station, and since  
5 then have filed numerous PSD applications for power plants.

6 Q. Thank you. Do you have a summary of your testimony,  
7 Mr. Gaige?

8 A. Yes. My testimony was related to the air permitting  
9 basically for this Big Stone II project and the administrative  
10 rules of South Dakota included about 10 regulations that are  
11 applicable to the emissions resulting from the Big Stone II  
12 Unit. Nine major preconstruction permits of this type or for  
13 this type of facility as this PSD, or prevention of significant  
14 deterioration permit, and it's administered by the South Dakota  
15 Department of Environment and Natural Resources. These are  
16 federal regulations, but it's been delegated to the states for  
17 enforcement and because the emissions of the sulfur dioxide and  
18 nitrogen oxide, SO<sub>2</sub> and NO<sub>x</sub> are going to be reduced from Unit  
19 I, the net emission increase resulting from Unit II will be  
20 below the threshold emission rate requiring PSD review. So  
21 those two pollutants are exempted from further review under  
22 that program.

23 The pollutants that were reviewed under this permit  
24 application included the particulate matter less than 10  
25 microns, PM 10, the carbon monoxide or CO, volatile organic

1 compounds, VOC, sulphuric acid mist, referred to as SAM or SAM  
2 and fluoride. The Best Available Control Technology or BACT,  
3 which is required under the PSD program, was determined for  
4 these pollutants. And the BACT basically establishes emission  
5 controls for coal-fired boilers themselves, also for the  
6 cooling towers, the diesel engines used for fire protection and  
7 emergency generation, and also the material handling system.

8 Dispersion modeling was also performed as part of the  
9 permit application. The purpose of that is to predict the  
10 potential ambient concentrations of the air pollutants, and  
11 this effort determined that the proposed plant would comply  
12 with the national ambient air quality standards, the PSD  
13 increments, both class one and class two areas, and met the  
14 requirements for impact air quality related values. Other  
15 permits and approvals will include the operating permit, which  
16 is not required until the plant begins operation, the acid rain  
17 rules, and the Clean Air Mercury Rule.

18 And that concludes my summary.

19 MR. SASSEVILLE: Thank you, Mr. Gaige. At this time  
20 we will tender Mr. Gaige for cross-examination.

21 MR. SMITH: MCEA, you may proceed.

22 MR. O'NEILL: No questions of this witness.

23 MR. SMITH: Ms. Stueve?

24 CROSS-EXAMINATION

25 BY MS. STUEVE:

1 Q. Good morning, Mr. Gaige.

2 A. Good morning.

3 Q. And thank you for your testimony and I'm glad you  
4 could do it via phone and not have to do the travel.

5 A. As am I.

6 Q. Have you testified previously in power plant  
7 permitting cases? It appears you did, you mentioned briefly  
8 you are involved in one of the first BACT, B-A-C-T?

9 A. Yes. And yes, I have testified previously.

10 Q. And which ones in particular?

11 A. In the Wisconsin public service application for the  
12 Westin IV unit.

13 Q. Any other ones?

14 A. No.

15 Q. Okay, and was the Wisconsin one permitted, the Westin  
16 IV?

17 A. Yes.

18 Q. On what grounds?

19 MR. SASSEVILLE: Object to the form and for lack of  
20 foundation.

21 MR. SMITH: What do you mean by "grounds"? Can you  
22 just specify with a little more clarity what you mean?

23 MS. STUEVE: I will pass on that one.

24 MR. SMITH: No, it's okay. You can ask the question  
25 if you can just --

1 Q. (BY MS. STUEVE) Was it permitted on the grounds of  
2 Wisconsin permitting guidelines, for example? Was it reviewed  
3 according to?

4 A. The application was reviewed by the state and a permit  
5 was issued. It was also challenged and reviewed. So I would  
6 say yes, that it has been issued as the application was in  
7 compliance with the state rules and regulations.

8 Q. It sounds like you just said it was challenged and  
9 reviewed, so does that mean it's under review at this time?

10 A. No.

11 Q. Okay, thank you. And is your testimony on emissions  
12 in this case limited to the BACT analysis?

13 A. No.

14 Q. Okay. And are you familiar with other types of  
15 analysis of power plant emissions aside from the BACT?

16 A. I guess I'm unclear as to what you're asking.

17 Q. Are there any other ways to analyze emissions versus  
18 the BACT?

19 A. I'm sure there are other ways to analyze it. My  
20 testimony is related to how this project's -- how this project  
21 is proposed to comply with the regulations.

22 Q. And so you chose to do the BACT in particular as an  
23 analysis of these emissions for this project?

24 A. The BACT is a regulatory requirement under the PSD  
25 program, so we were -- I was looking at that as a review and

1 expansion of how this project is complying with the regulatory  
2 requirements.

3 Q. Okay. Would you agree with me that there are other  
4 types of analyses?

5 MR. SASSEVILLE: Could you explain what you mean by  
6 "analyses," Ms. Stueve?

7 MS. STUEVE: On how to analyze emissions to meet the  
8 requirements.

9 MR. SASSEVILLE: For purposes of a permitting  
10 proceeding like this one?

11 MS. STUEVE: Exactly, thank you.

12 A. Are you asking are there other ways other than the  
13 Best Available Control Technology determination?

14 Q. (BY MS. STUEVE) Yes.

15 A. I guess the answer, my answer would be no, the PSD  
16 requirements are pretty clear that they do require a Best  
17 Available Control Technology.

18 Q. Okay, thank you. Getting to your direct testimony on  
19 page 4, let me see what exhibit number we have here.

20 MR. SASSEVILLE: 22.

21 Q. (BY MS. STUEVE) We have Exhibit 22, page 4, on line  
22 11.

23 A. Okay.

24 Q. And you state that SO<sub>2</sub> and N-O-X, NOX, are not  
25 regulated because the net increase is de minimis; is that your

1 testimony today?

2 A. Well, I don't believe the statement says that they are  
3 not regulated. What we indicated there is that those two  
4 pollutants, the net increase in emission is below de minimis,  
5 so they are not subject to review under the BACT program.

6 Q. And would that make a difference with the type of coal  
7 that would be used, for example, the SO<sub>2</sub>?

8 A. The SO<sub>2</sub> emissions are dependent on the amount of  
9 sulphur input to the unit, so I guess the answer to that would  
10 be yes, it is dependent on the coal.

11 Q. And in particular, would Montana coal have a higher  
12 sulphur content than -- which was used according to Otter Tail  
13 Power as an interim measure recently with the coal shortage?

14 A. I really don't have the information to answer that  
15 question. I'm not sure what the sulphur content of Montana  
16 coal would be.

17 Q. Okay, thank you. I did hear you say, though, there is  
18 a difference in SO<sub>2</sub> content dependent on the coal used.

19 A. Yes, that's true.

20 Q. Are SO<sub>2</sub> and NO<sub>x</sub> regulated by state law in any way,  
21 South Dakota state law?

22 A. Yes.

23 Q. And how?

24 A. There is new source performance standards for -- that  
25 new units need to comply with that restrict the emissions of

1 both SO2 and NOX.

2 Q. Okay. Are SO2 and NOX regulated by the federal  
3 government in any way?

4 A. The federal rules establish the new source performance  
5 standards for this type of unit and those rules are the rules  
6 that are enforced by the state. Does that answer that  
7 question?

8 Q. Yes, thank you. Can you describe the specifics of  
9 monitoring under these rules?

10 MR. SASSEVILLE: I'll object to the form, that's  
11 fairly broad. Could you narrow it, Ms. Stueve?

12 Q. (BY MS. STUEVE) Can you describe the specifics of  
13 monitoring that you may be familiar with in the state of South  
14 Dakota via either state or federal regulations for the new  
15 source, is it new source performance standards?

16 A. Well, I believe I can. The information I have, there  
17 is a lot of different ways to do monitoring and it's typically  
18 what is required in the permit is then what is put into place.  
19 So I'm not sure if I could describe exactly what is going to be  
20 applied to Big Stone II at this point, but I could describe  
21 monitoring in general.

22 Q. Okay. So it's dependent on a case-by-case basis?

23 A. Yes, it's dependent on working that out, I guess, with  
24 the state regulatory agency on what they want to see for  
25 demonstration of compliance with the emission limits.

1 Q. So it seems you are saying that that would be  
2 something between this project and the South Dakota DENR to  
3 work out.

4 A. The monitoring requirements to demonstrate compliance  
5 with the emission limits is a part of the permit that's issued  
6 by the state.

7 Q. Okay, thank you. Is the same true of lead?

8 A. Yes, lead emissions are regulated under the PSD  
9 program and the state agency does have a responsibility to  
10 establish an emission limit and a demonstration of compliance  
11 with that.

12 Q. And is the monitoring the same?

13 MR. SASSEVILLE: The same as what?

14 Q. (BY MS. STUEVE) Is the monitoring the same as what  
15 you explained it would be based on the permitting with the  
16 DENR, the state agency?

17 A. The state agency would be responsible for establishing  
18 what would be required for monitoring, yes.

19 Q. Thank you. Let's look again at Exhibit 22, page 5 and  
20 on lines 10 and 11, you use the phrase "specific application."

21 A. Yes.

22 Q. Can you define that term, please?

23 A. The Best Available Control Technology, which is what  
24 is being discussed at that page, is a case-by-case  
25 determination. In other words, one plant, coal-fired power



1 plant you might determine the control technology appropriate  
2 for that, it may not be appropriate for a different coal-fired  
3 power plant. So what we are referring to there when we say  
4 "specific application" is in this specific case with this  
5 particular plant burning this particular coal and all of the  
6 other parameters associated with that.

7 Q. Thank you. So a case-by-case basis, all right. Do  
8 you agree that the guidance of the EPA is nonbinding?

9 MR. SASSEVILLE: I'll object to the form of the  
10 question to the extent it calls for a legal conclusion and for  
11 lack of foundation.

12 MR. SMITH: I'm going to let you go ahead and ask it.  
13 Are you able to answer that, Mr. Gaige, to address that issue  
14 as the relationship between EPA and the state?

15 A. Well, I think there's a lot of guidance and  
16 information coming from EPA that is binding. In this  
17 particular relationship to BACT, there is a documentation or  
18 guidance, I guess, from EPA referred to as the top down  
19 approach to a BACT determination and that has been ruled fairly  
20 recently to be nonbinding.

21 Q. (BY MS. STUEVE) Okay, thank you. What control  
22 technologies did you identify for analysis in this project?

23 A. Well, the control technologies that were discussed in  
24 the BACT were -- they are pollutant specific. The particulate  
25 or PM 10 emissions, we reviewed both electrostatic

1 precipitators and fabric filters. For the -- the othe  
2 pollutants are somewhat dependent on what pollution controls  
3 are being put in for the major pollutants and then also  
4 combustion controls for CO and VOC is the primary technology  
5 that was reviewed.

6 Q. By VOC do you mean volatile organic pollutants?

7 A. Yes, volatile organic compounds is the VOC.

8 Q. Thank you. Again on your exhibit, Mr. Gaige, on page  
9 7, line 9 it states that critical to this determination is the  
10 identification of the project. Is the, quote, unquote,  
11 identification of the project a classification or  
12 characterization of the project?

13 A. Oh, it's both.

14 Q. And is this the same as, quote, unquote, defining the  
15 design of the source?

16 A. It's a little bit more than that.

17 Q. How so, please?

18 A. It's not just the design of the source, but also  
19 includes the fuel quality and in many cases the water quality.

20 Q. Okay, so there's variables?

21 A. Yes.

22 Q. Thank you. Fuel quality, water quality?

23 A. Correct.

24 Q. Any other variables that come to mind?

25 A. There are some related to fugitive dust emissions, but

1 it gets fairly -- it gets into a lot of things about silt  
2 content and things like that.

3 Q. Thank you. And how did you identify or define this  
4 project in particular?

5 A. I'm not sure I know what you're asking.

6 Q. Well, for example, you identified -- you said defining  
7 the design of the source is kind of more than that. How did  
8 you identify or define this project as far as identifying it as  
9 a source or what you would look at, for example?

10 MR. SASSEVILLE: I'll object to the form of the  
11 question. If you understand, Mr. Gaige, go ahead and answer,  
12 but I didn't understand it and I would ask Ms. Stueve to  
13 rephrase it.

14 Q. (BY MS. STUEVE) I'm not a BACT specialist so I  
15 apologize, Mr. Gaige. This is confusing to say the least.

16 A. That's okay. I think the best way I can answer that  
17 is that there was a design information, if you will, related to  
18 this is proposed as a supercritical coal-fired boiler and a  
19 coal supply was identified as a design coal and the water  
20 resource was defined for the project, so all of that  
21 information went into this case-by-case determination.

22 Q. Thank you, that helps.

23 A. Okay.

24 Q. Me, anyway. Under the federal rules, what leeway does  
25 a state have in defining the design of the source?

1           A.     That's a little bit difficult to answer in that these  
2 federal rules are not very definitive and we go more by policy  
3 and interpretation of those rules, and the interpretations of  
4 those rules and the guidance documents that have been developed  
5 by EPA indicate that the state does not have the leeway to  
6 change the design of the source.

7           Q.     I'm going to rephrase back to make sure I heard it  
8 right. This is complicated, you are right. Did I hear you say  
9 we go more by -- or first of all, federal rules are not very  
10 definitive. We go more by policy, interpretation of those  
11 rules.

12          A.     Yes.

13          Q.     And then you ended with state -- but state does not  
14 have leeway, would you call it, to -- what was the end of  
15 your --

16          A.     Yes, there's some specific guidance that indicates  
17 that the -- for example, or one example that's presented that's  
18 very similar to this case is that a source is proposed to  
19 produce electricity and if it's a, for example, a coal-fired  
20 source the state does not have the leeway to come back and say  
21 that a gas-fired source would be BACT. That would be changing  
22 the design of the project and that leeway is just not part of  
23 the regulatory responsibility of the state.

24          Q.     Okay, thank you. To your knowledge, has there been  
25 prior BACT analysis of coal-fired power plants?

1 MR. SASSEVILLE: Could you be more specific by a state  
2 or with respect to a particular project?

3 MS. STUEVE: In South Dakota, for example.

4 A. In South Dakota I don't know.

5 Q. (BY MS. STUEVE) In the one you worked on in  
6 Wisconsin.

7 A. Yes.

8 Q. So that would be the Wisconsin one or were there more  
9 than one?

10 A. This was the Westin IV, the fourth unit at a plant.

11 Q. Westin IV. Are you familiar with any BACT analyses of  
12 coal-fired plants done in Minnesota?

13 A. I don't believe so.

14 Q. To your knowledge, in BACT analysis, does South  
15 Dakota, quote, unquote, engage in a broader analysis as allowed  
16 by federal law?

17 A. I am not aware of that.

18 Q. Does South Dakota consider alternative production  
19 processes?

20 A. I would not be aware of that.

21 Q. Does South Dakota include inherently lower polluting  
22 processes in BACT analysis?

23 A. I can't speak to specifically what South Dakota does.  
24 I know that that is -- lower polluting processes is part of the  
25 BACT analysis that should be reviewed.

1 Q. That should be reviewed. Did you say previously that  
2 BACT analysis does not apply to the IGCC or it can't be  
3 switched over once it's been done for a coal-fired analysis?

4 MR. SASSEVILLE: Ms. Stueve, you said did he say he  
5 previously, where would he have said that?

6 MS. STUEVE: Previously a few minutes ago.

7 A. Could you rephrase that question?

8 Q. (BY MS. STUEVE) Okay. We were talking a few minutes  
9 ago, to your knowledge has there been prior BACT analysis of  
10 coal-fired power plants and we were talking about the federal  
11 rules and what leeway does a state have in defining the design  
12 of the source. And I scribbled a note here, you mentioned  
13 something that once done for a coal-fired analysis, it  
14 doesn't -- it does not necessarily apply to the IGCC.

15 A. I don't recall mentioning IGCC at all.

16 Q. Okay. Maybe I wrote my acronyms down wrong. There's  
17 too many.

18 A. Okay.

19 Q. Forgive me for that. On page 12, let's go back to  
20 your exhibit, please, it's Exhibit 22, page 8, lines 11 through  
21 12.

22 A. Okay.

23 Q. You state one of the best ways to identify available  
24 control technologies is to review previous BACT determinations  
25 for similar sources.

1 A. Correct.

2 Q. Did you review -- for the record, did you review prior  
3 BACT decisions?

4 A. Yes, we did.

5 Q. Okay, yes. And generally what did you learn in your  
6 review?

7 A. Let me elaborate a little bit on that question. The  
8 EPA or Environmental Protection Agency, does maintain this  
9 database of the previous BACT determinations, and it's referred  
10 to as this RACP-BACT-LAER clearinghouse, and that is a very  
11 searchable database, so we did review that for similar  
12 facilities, specifically for coal-fired electrical generation  
13 facilities, and with that information is provided on a large  
14 number of other determinations what technology was used and  
15 what emission limits were established. We were looking  
16 specifically for the coal-fired power plant control options for  
17 particulate control and learned from that that most other  
18 facilities were using either fabric filters or electrostatic  
19 precipitators.

20 Q. Okay, thank you. Did you review prior South Dakota  
21 BACT decisions?

22 A. I'm sure that we did. They would be included in that  
23 RACP-BACT-LAER clearinghouse that EPA maintains.

24 Q. Can you give the plant name?

25 A. Well, it's -- the ones that would get the closest

1 scrutiny in that review would be the ones that are more recent  
2 and have the most stringent control or results for that plant.  
3 I don't believe that there is any other coal-fired power plants  
4 in South Dakota other than Big Stone I and it was not subject  
5 to PSD.

6 Q. So to the best of your knowledge, any South Dakota  
7 plant that would be included in this EPA database with all  
8 those acronyms would probably be the Big Stone I, to the best  
9 of your knowledge?

10 MR. SASSEVILLE: I think that misstates his testimony.

11 A. To the best of my knowledge, there would be no other  
12 BACT determinations from South Dakota for similar facilities,  
13 i.e., for coal-fired power plants.

14 Q. (BY MS. STUEVE) Okay, thank you. Is the scope of  
15 analysis using this identification of the project that we  
16 talked about earlier, defining the design of the source,  
17 consistent with past South Dakota practice?

18 A. I don't believe I can answer that. I could give a  
19 guess as to what I would think.

20 MR. SASSEVILLE: I don't want you to guess, Mr. Gaige.

21 A. Okay. My assumption is that the South Dakota agency  
22 would be following EPA guidelines, since it is a delegated  
23 program and that they would look at previous applications.

24 Q. (BY MS. STUEVE) Thank you. Did you review the BACT  
25 analysis for the Elm Road Generating Station in Wisconsin?



1 A. Yes, I did.

2 Q. Could you compare this with that analysis, this  
3 analysis for this project with that one?

4 A. I could, not right now without having both of them  
5 here to compare. Each analysis is on a case-by-case basis and  
6 one example is that both -- I believe both SO2 and NOX were  
7 part of the BACT determination for that unit, where they're not  
8 for this unit so there would be a lot of differences.

9 Q. Okay. A lot of differences, but I can appreciate  
10 without having the cases side by side you are unable to answer  
11 specifically at this time.

12 A. Right, okay.

13 Q. Is that correct?

14 A. Yes, that's correct.

15 Q. Okay. Thank you. But there are differences you said.

16 A. Yes.

17 Q. And the one you did mention had to do with the NOX.

18 A. Yes.

19 Q. And just so I'm clear on it, the difference with the  
20 NOX, could you repeat that?

21 A. The Elm Road unit, as I recall, was subject to review  
22 under the PSD program or BACT determination for both sulphur  
23 dioxide and NOX, whereas the Big Stone II unit has been  
24 exempted from review for those two pollutants.

25 Q. Thank you. That clears it up greatly for me. Several

1 recent BACT analysis in other jurisdictions have addressed  
2 IGCC. Have you in your work incorporated IGCC into BACT  
3 analysis for a coal-fired power plant?

4 A. No, I have not.

5 Q. Have you reviewed BACT analysis incorporating IGCC?

6 A. Yes.

7 Q. And which ones, please?

8 A. I believe the one that I reviewed was Prairie States.

9 Q. In which state would that be?

10 A. Illinois.

11 Q. Prairie States in Illinois? Have you reviewed a New  
12 Mexico BACT analysis incorporating IGCC?

13 A. I recall reading portions of one for one of the plants  
14 in New Mexico, but I would not categorize that I guess as  
15 reviewing it.

16 Q. So it sounds like you are familiar with it, you did  
17 not review it?

18 A. Correct.

19 Q. Thank you.

20 MR. SASSEVILLE: I'm sorry to interrupt, Ms. Stueve,  
21 but I'm not sure where this is going. We are wandering down  
22 some path across country on IGCC. This is not an IGCC project  
23 and I would object to the line of questioning on relevance  
24 grounds.

25 MR. SMITH: Well, let's see where it goes and if it

1 becomes way out there, then I'll step in, how's that?

2 MR. SASSEVILLE: That's fine, New Mexico is pretty far  
3 out there, though.

4 MR. SMITH: I think I know where she's heading with  
5 this and I think he's already maybe provided an answer that  
6 deals with this, but let's let her explore what this is and  
7 then we'll deal with it if it gets too far afield.

8 MS. STUEVE: And we can go quickly with a yes or no on  
9 these. So I will mention a few more states, maybe just one  
10 more state.

11 Q. (BY MS. STUEVE) Have you reviewed West Virginia BACT  
12 analyses incorporating IGCC?

13 A. No, I haven't.

14 Q. Okay, thank you. And other jurisdictions have not  
15 included IGCC clearly. Have you reviewed any BACT analysis  
16 from Wyoming, Montana or Kentucky?

17 A. Yes.

18 Q. Okay, all three, Wyoming, Montana and Kentucky?

19 A. I have briefly reviewed some BACT information from  
20 those states. I don't recall any of those dealing with IGCC.

21 Q. All right, we will get back to South Dakota. So for  
22 the BACT analyses in this case, what were the specific  
23 parameters of quote, unquote, the source?

24 A. It was defined as a supercritical pulverized coal  
25 unit.

1 Q. Okay. That's the specific parameters, right?

2 A. That's part of them. The design coal was also defined  
3 and I don't recall exactly what that was at this point.

4 Q. And in this specific BACT analyses, what range of  
5 alternatives were considered? For example, was natural gas  
6 considered?

7 A. The range of alternatives that were reviewed were the  
8 alternatives to control the emissions from that defined plant.

9 Q. From the defined plant meaning the coal plant?

10 A. Yes.

11 Q. So in this BACT analysis, a range of alternatives to  
12 be considered were not considered, meaning other sources such  
13 as natural gas, IGCC, wind, wind/gas combination or nuclear.

14 A. That's correct.

15 Q. Okay. Thank you. And for your BACT analysis, how do  
16 you define, quote, unquote, commercially available?

17 A. That's typically defined as a process that can be  
18 purchased with a guarantee from a manufacturer and has been  
19 demonstrated in practice.

20 Q. Demonstrated, so in that definition, what allowance --  
21 excuse me -- so in that definition, what allowance do you make  
22 for commercial practicability or impracticability?

23 MR. SASSEVILLE: Object to the form, it's vague. If  
24 you understand, you can answer.

25 A. Well, there's a couple of criteria that are used to

1 review. One is the feasibility of the application of that  
2 technology to the source and the second criteria is that same  
3 technology commercially available. I think that your question  
4 just now was more related to that first part of that, is that  
5 application of that technology feasible to this particular  
6 source.

7 Q. (BY MS. STUEVE) Exactly.

8 A. And there's certainly a lot of parameters that go into  
9 that in review of this particular source, is there -- in its  
10 application to the source, is it appropriate. There's just a  
11 lot of parameters that would go into that.

12 Q. I can appreciate that and I'm sure I do not understand  
13 all of that. You state on page 8, back on your testimony,  
14 Exhibit 22, page 8.

15 A. Okay.

16 Q. Lines 15 through 16, that, quote, control equipment on  
17 pulverized coal units has been limited to few types.

18 A. Correct.

19 Q. What is impact of this limitation on BACT analysis?

20 MR. SASSEVILLE: Object to the form of that question.  
21 That is definitely vague.

22 MR. SMITH: Sustained.

23 A. I'm not sure I understand. Should I answer the  
24 question?

25 MR. SASSEVILLE: No.

1 MR. SMITH: No, we'll let her ask it again if she can.

2 Q. (BY MS. STUEVE) Could you agree with me that control  
3 equipment on pulverized coal units has been limited to few  
4 types?

5 A. That's still a very broad question. There's a lot of  
6 different pollutants out of a coal-fired power plant that are  
7 subject to BACT review in different situations and there are a  
8 range of control alternatives for each pollutant that we  
9 typically talk about. The RACP-BACT-LAER clearinghouse  
10 information certainly provides a good guidance as to what has  
11 been determined in previous reviews as the best for that  
12 particular application, so it's a good starting place, if you  
13 will, to look at what control technology might be appropriate  
14 for this installation.

15 Q. Thank you. I see reading here again on your testimony  
16 8, line 15, you are referring to -- I had quoted this and you  
17 are referring to the RACP-BACT-LAER clearinghouse.

18 A. Correct.

19 Q. As saying that control equipment on pulverized coal  
20 units has been limited to few types. Thank you. On page 9,  
21 Exhibit 22, you testify that -- do I have the line -- yes, line  
22 9, page 8, line 9, test for SAM and FI, SAM and FI, will also  
23 be done if requested by the DENR, I'm assuming that's the South  
24 Dakota DENR. Is this customary in your experience?

25 A. The FI is actually FL, it's fluoride emissions.

1 Q. Thank you.

2 A. And yes, it's customary. Where emission limits are  
3 established, the state has an obligation of the permit, it  
4 needs to define how compliance with that emission limit will be  
5 established and that is the monitoring or sampling or testing  
6 program.

7 Q. And what is the purpose of baseline testing?

8 A. I hate to say that -- I don't want to qualify that  
9 as -- it's kind of a broad question, but the baseline testing  
10 in general would be you test it at a baseline point and then  
11 you make a change and test it at a changed point.

12 Q. Again on page 9, staying on page 9, you testified  
13 that -- let me look for the line -- oh, here we go, line 21,  
14 page 9.

15 A. Okay.

16 Q. The actual emissions will be significantly lower than  
17 historic emission rates. Can you define "significantly lower"?

18 A. I cannot give you a specific number, or I would have  
19 in the testimony. "Significantly" certainly means measurably.

20 Q. Measurably. Do you mean historic emission rates of  
21 Big Stone I, for example?

22 A. In this particular case, what we are talking about is  
23 the emissions of SO<sub>2</sub> and NO<sub>X</sub>, and what has been asked for in  
24 this case is that we establish a limit at the facility for the  
25 combined emissions of Big Stone I and Big Stone II, and that is

1 the intention of this comment and the intention, as I  
2 understand it, of the operators, that the units after Big Stone  
3 II is installed, the actual emissions will be lower than what  
4 the historic emissions have been from Big Stone I.

5 Q. Thank you. I believe I'm to the last set of a  
6 question with maybe a follow-up. Your testimony about  
7 monitoring is vague, that various measures, your testimony  
8 about monitoring is vague, in my mind. And maybe it's because  
9 I'm not the expert here, but it says that various measures,  
10 quote, unquote, will be monitored and reported to the agency  
11 periodically, and I'm assuming you mean the DENR when you say  
12 agency, correct?

13 A. Correct.

14 Q. Okay, so what is typical?

15 A. The monitoring requirement is typically dependent on  
16 the pollutant that we are talking about and dependent on what  
17 the emission limit is that's established by the state. For  
18 particulate, for example, the mass emission rate for  
19 particulate is usually established in the permit, but that is  
20 very difficult to measure on a continuous basis, so mass  
21 emissions are typically done with an annual or semiannual stack  
22 test and combined with an opacity monitor, which gives an  
23 indication of particulate emissions.

24 Q. Have you made recommendations regarding monitoring and  
25 reporting previously?



1 A. Yes.

2 Q. And those recommendations are?

3 A. There are some suggestions for Big Stone II monitoring  
4 and reporting that were included in the permit application. It  
5 would probably be best to review that application before I  
6 respond.

7 Q. Again, I can appreciate that. And when you say the  
8 permit application, you mean the PSD in South Dakota?

9 A. Yes.

10 Q. Okay, and -- you may not be privy to that. I was  
11 going to say, is that currently underway, do you know?

12 A. Yes, I know that the state agency, the South Dakota  
13 DENR has issued a draft permit that's out for public review at  
14 this time.

15 Q. Okay, so it's under review, okay, thank you. Is there  
16 anything in particular that you would recommend that you do  
17 recall you putting in there?

18 A. There are recommended testing procedures from EPA, for  
19 example, method five is used for particulate testing, and those  
20 EPA-approved methods I'm sure are the basis for the  
21 recommendation.

22 MS. STUEVE: Thank you. And I do so appreciate your  
23 patience with my questions and for joining us here. That's the  
24 end of my questions.

25 MR. SMITH: Thank you. Does staff have any questions?

1 MS. CREMER: Staff does not have any questions. Thank  
2 you.

3 MR. SMITH: Does the -- do the commissioners have any  
4 questions of Mr. Gaige?

5 VICE-CHAIR JOHNSON: I do not.

6 COMMISSIONER HANSON: No.

7 MR. SMITH: Does the applicant have any redirect?

8 MR. SASSEVILLE: I have about 58 redirect -- just  
9 kidding.

10 MR. SMITH: Do they involve New Mexico? (Laughter)

11 CHAIRMAN SAHR: Could I ask one thing. Could you put  
12 up the first page of the presentation, the summary presentation  
13 please? If I had a hard copy I wouldn't make you do this but I  
14 wanted to look at one thing that was on one of the bullet  
15 points to see if I have an additional question. Thank you very  
16 much. I remembered it correctly and I do not have an  
17 additional question. Thank you.

18 MR. SASSEVILLE: And I have no redirect.

19 MR. SMITH: You are excused, Mr. Gaige, which means we  
20 will be hanging up on you. Thank you very much.

21 THE WITNESS: Thank you. Bye-bye.

22 MR. SASSEVILLE: At this time the applicants call Hoa  
23 Nguyen.

24 Thereupon,

25 HOA NGUYEN,

1 called as a witness, being first duly sworn as hereinafter  
2 certified, testified as follows:

3 DIRECT EXAMINATION

4 BY MR. SASSEVILLE:

5 Q. Good morning, Mr. Nguyen.

6 A. Good morning.

7 Q. Would you state your name for the record and spell it,  
8 please?

9 A. My name is Hoa Nguyen, the first name is spelled  
10 H-O-A, and the last name is Nguyen, N like in Nancy, G-U-Y-E-N.  
11 In case you may have misspelled it, the same last name, the  
12 same person just won the South Dakota lottery a couple weeks  
13 ago.

14 Q. So you will be retiring soon?

15 A. Unfortunately, he is related to me about -- we have  
16 the same ancestor about 5,000 years ago.

17 Q. Mr. Nguyen, you are the power supply coordinator for  
18 Montana-Dakota Utilities?

19 A. Yes, I am.

20 Q. Did you prepare or cause to be prepared prefilled  
21 written testimony in this proceeding?

22 A. Yes, I did.

23 Q. Do you have in front of you Applicants' Exhibits 11  
24 and 48?

25 A. Yes, I do.

1 Q. And is Applicants' Exhibit 11 your prefiled direct  
2 testimony?

3 A. Yes.

4 Q. And Applicants' Exhibit 48 is your prefiled rebuttal  
5 testimony?

6 A. Yes.

7 Q. Do you have any corrections or revisions to either of  
8 these exhibits?

9 A. No, I don't have any corrections.

10 Q. If I were to ask you each of the questions set forth  
11 in these exhibits today, would your answers be the same?

12 A. Yes, they would.

13 MR. SASSEVILLE: Applicants offer into admission  
14 Exhibits 11 and 48.

15 MR. SMITH: Any objections?

16 MS. GOODPASTER: No objection.

17 MS. STUEVE: No objection.

18 MR. SMITH: Applicants' Exhibits 11 and 48 are  
19 received into evidence.

20 EXHIBITS:

21 (Applicants' Exhibit Nos. 11 and 48 received into  
22 evidence.)

23 Q. (BY MR. SASSEVILLE) Mr. Nguyen, did you prepare a  
24 summary of your testimony for the commission?

25 A. Yes, I do, I did.

1 Q. Would you present it for them at this time, starting  
2 with your qualifications?

3 A. Yes, as power supply coordinator for the company, I am  
4 involved with most of the resource planning studies and other  
5 studies relating to generation, production costing, and I also  
6 represent the company in various MAPP, Mid-Continent Area Power  
7 Pool, Midwest Reliability council -- Organization, which is  
8 MRO, and the North American Electric Reliability Council or  
9 NERC.

10 For my education background, I graduated in 1970, only  
11 a short while ago, only 36 years, as an electrical engineer  
12 from the Vietnam National Institute of Technology. In 1972 I  
13 obtained a master of science in electrical engineering from the  
14 University of Saigon and from '72 to '75 I was working on my  
15 doctorate of engineering program and until '75 I did not have a  
16 chance to complete it because I had to leave the country to  
17 seek political asylum in the United States, and at this point I  
18 am glad that my wife, I wanted her to be here to witness the  
19 regulatory procedure of the freedom of this country and she's  
20 here. When in the United States, I also obtained a master of  
21 business administration from the University of North Dakota in  
22 1995 and in 1998 I also obtained another master's degree in  
23 public administration, that's my educational background.

24 For professional experience, after graduating from  
25 college, I taught at two universities, first as a physics

1 instructor, a professor, assistant professor of electrical  
2 engineering. Since 1975 I started with Montana-Dakota  
3 Utilities, a wonderful company, in Bismarck, North Dakota, the  
4 coldest point in the world, and started as a staff engineer and  
5 progressive to senior staff in 1984 and in 1997 I became what I  
6 am now, a power supply coordinator.

7 Q. Are you a registered professional engineer in the  
8 United States?

9 A. Yes, I am a registered professional engineer in North  
10 Dakota.

11 Q. Would you mind continuing past the overview with the  
12 substance of your summary, please?

13 A. Yes. The first is that our integrated resource  
14 planning process and our process is an extensive process that  
15 covers four areas, the one is the load forecasting that we use  
16 the result as a basis for the resource plans, for sales, for  
17 budgeting purpose and et cetera. We look at the demand side by  
18 the demand-side analysis. We look at the supply side and we  
19 integrate them, the demand side and supply side, in the  
20 integration process. And our IRP process is helped with input  
21 from a broad-base advisory group, we call it IRP public  
22 advisory group or PAG, and they help us to review the  
23 assumptions and the results of our IRPs.

24 The load forecast we use an end use, end use model and  
25 develop a long-range 20-year forecast for integrated system.

1 Our integrated system consists of our service territories in  
2 Montana, North Dakota and South Dakota. I mentioned South  
3 Dakota last because it's alphabetical order, it's not because  
4 South Dakota is less. And we project that our energy to grow  
5 1.3 percent for ten years and the peak demand grow at a  
6 comparable rate of one percent annually for ten years.

7           Next I'd like to talk about the need for -- our need  
8 for Big Stone II. Based on existing needs and our forecast, we  
9 will be deficit 101 megawatt in 2011 and 134 in 2016 and that  
10 deficit would go to 164 in 2021, assuming normal weather and  
11 the minimum level of capacity obligation as required by MAPP.  
12 And those deficits are caused largely and mainly because we  
13 have the purchase power contract with Basin Electric for our  
14 AVS II. It will expire in October of this year, 2006, so we  
15 are going to lose 66.4 megawatt of base load as of November 1st  
16 of 2006.

17           Also from there we have increased demand, demand for  
18 electricity for our customer, both energy and peak demand. Big  
19 Stone's share will be the best cost resource option for us.  
20 I'd like to kind of emphasize, and this is not -- we determined  
21 this plan based on the least cost principle, but we also  
22 consider other factors. The other factors include that a base  
23 load plant has lower cost of volatility gas prices and most  
24 stable fuel price to supply the natural gas. It provides a  
25 long-term value for our customers and the best cost also take

1 into account the opportunity that we can participate in a base  
2 load plant with a large economy of scales and the best cost  
3 also take into other factors such as the company or our  
4 customers will not have to rely on the fluctuating market, MISO  
5 market, for energy.

6 We also consider the opportunity for or the potential  
7 for having off-peak energy when our customers don't use their  
8 energy, we can sell it to the market and at the present time  
9 the reason for that particular off-peak system sale is at the  
10 present time we have -- with North Dakota where 60 percent of  
11 our energy, our load is sold, we have a sharing mechanism in  
12 the state of North Dakota whereby 85 percent of the margin, the  
13 benefit that we have reaped from those off-system, off-peak  
14 system sales, will be sent back or will be for our customers.  
15 The company as an incentive, the company is able to, is allowed  
16 to keep 15 percent of the margin. So the off-system sale is  
17 one of the factors considered in the best cost.

18 Another factor in the best cost that we looked at is  
19 that opportunity for our system to be able to accommodate some  
20 economic development, if that opportunity comes, those are  
21 the plans. And when formulating the best cost, we also like  
22 to -- we also consider or took into account the consumers. For  
23 example, we do have some wind in that and wind, our previous  
24 studies showed that wind was not the least cost for our  
25 resource, for our system. So we put all those, are those the



1 best cost.

2 I'd like to talk about the current programs and plans  
3 for our demand-side management or DSM programs and renewables.  
4 Currently we have a peak shaving two and a half megawatt  
5 programs and we have planned, in fact we are implementing  
6 starting in 2006 six and a half megawatt of DSM and  
7 conservation measures for the period of 2006 and 2010, which  
8 would result in a saving of 38,000 megawatt hours.

9 For renewables, currently we have a power purchase  
10 agreement with a wind developer in South -- that plant in South  
11 Dakota, 31.5 megawatt of wind. And we also have a commitment  
12 to develop or purchase or acquire 30 megawatt of renewable  
13 power generation by 2015. I also would like to address that --  
14 to make a small assessment to the 1200 megawatt of wind  
15 alternatives for propose or suggested, whatever the word that's  
16 correct by intervenors, is that assuming that we have an 800 to  
17 1200 megawatt of wind and we make an analogy, we will own 19.3  
18 percent of Big Stone, that will translate into 154 or 232  
19 megawatt of wind from that plant, okay, it seems that, okay,  
20 that 154 to 230 translates into 36 to 51 percent of our total  
21 system peak for our integrated system in 2011.

22 36 percent, I'll take the lower number, 36 percent of  
23 wind as of our total peak demand is our minimum load, and that  
24 minimum -- and for operationwise, we need to maintain a  
25 minimum -- must run units for the coal-fired unit at night so

1 that to be ready for the next day when the consumers are using  
2 more energy. So at night at current now we are maintaining  
3 around 160 megawatt. If the wind -- another 160 megawatt of  
4 wind come in, we would have two options and none of that is  
5 desirable.

6           The first option is to take down our -- because wind  
7 is nondispatchable, we take wind and take down our must run  
8 units, that's perfectly okay, it's taken down. The only  
9 problem is that the next day when we ask for energy, then the  
10 operator, the plant operator will say I will need from  
11 somewhere, depending on the plan, somewhere from four to ten  
12 hours to bring this up, we don't have the energy for it, and it  
13 will be -- our system will be falling apart. I was talking  
14 about reliability and operating stability problems, in  
15 particular with MDU.

16           The second option is we don't take wind, we shut it  
17 down. Oh, that's fine for the developer, we pay, we still have  
18 to pay. And if we pay that, if we take it down, see, and  
19 that's another -- then if we take it, another option is that we  
20 dump it onto the MISO system and MISO system has in place the  
21 calculation of a location all marginal pricing mechanism that  
22 calculates the price of the energy that we generate and put it  
23 on MISO system based on the location, based on the transmission  
24 capability, et cetera.

25           And the problem is that when we dump it, no one is

1 liking it, so it will cause what we call negative locational  
2 marginal pricing, negative LMP. What it means is pay MISO to  
3 generate to supply the energy and that would cost about \$4  
4 million, four to \$6 million a year. So that plan would not, in  
5 particular that 800 to 1200 megawatt wind alternative would not  
6 work for us for MDU in particular, and in general I believe  
7 that in general criteria we would want to see that limit  
8 maximum would be around 15 to 20 percent range. I think that  
9 that concludes my summary.

10 MR. SASSEVILLE: Thank you. At this time Mr. Nguyen  
11 is available for cross-examination.

12 MR. SMITH: Would it be possible for us to take just  
13 an extremely short break? I have a FERC intervention I have  
14 got to file and I've got to get this -- could we do that, at  
15 least let me run that down there? Just take a five-minute  
16 break before we begin cross-examination.

17 CHAIRMAN SAHR: That makes sense.

18 (Whereupon, the hearing was in recess at 9:40 a.m.,  
19 and subsequently reconvened at 9:48 a.m. and the following  
20 proceedings were had and entered of record:)

21 MR. SMITH: If we could, could we be seated, please.  
22 The hearing is reconvened following a short recess, and we were  
23 about to begin joint intervenors' cross-examination of Mr. Hoa  
24 Nguyen. Is that how you say it?

25 THE WITNESS: Yes.

1 MR. SMITH: Please proceed.

2 CROSS-EXAMINATION

3 BY MS. GOODPASTER:

4 Q. Thank you, Mr. Smith. Good morning, Mr. Nguyen.

5 A. Good morning.

6 Q. I want to just first make sure that I understood one  
7 of the things you stated in your summary. You were discussing  
8 off-system sales opportunities in your discussion of best cost  
9 analysis; is that correct?

10 A. Yes, as part of those factors.

11 Q. Sure. And did you say whether those off-system sales  
12 are off-peak sales?

13 A. Yes.

14 Q. You did, okay. So you are talking about off-peak  
15 sales. Does MDU have a projection of the revenues from that  
16 off-system sales?

17 A. At this point, we don't have it yet because the MISO  
18 market is still too new for us. It has been there for about a  
19 year or so, so we don't have the long-term projection.

20 Q. So at this point you don't know whether you would be  
21 able to sell those -- make those off-system sales at a profit  
22 or not?

23 A. We do know that we can sell, but we don't have a firm  
24 number.

25 Q. Okay. Are you familiar, Mr. Nguyen, with the

1 responses to joint intervenor interrogatories and requests for  
2 production of documents to MDU in this proceeding?

3 A. I have read most of them.

4 Q. Okay. Are you familiar with that when intervenors  
5 asked MDU, in fact all the co-owners, what specific study or  
6 evidence supports the statement that studies point to a  
7 shortfall in -- a potential shortfall of base load generating  
8 capacity among the co-owners by 2011; do you remember that  
9 question being asked?

10 A. No, I don't.

11 Q. Would you have reason to disagree with me if I  
12 represented to you the Interrogatory 14 of intervenors' first  
13 amended set of interrogatories asked, what specific study or  
14 evidence supports the statement that studies point to a  
15 shortfall, potential shortfall of base load generating capacity  
16 among the co-owners by 2011?

17 MR. SASSEVILLE: Ms. Goodpaster, it might work best to  
18 refresh his memory by showing him the document.

19 MS. GOODPASTER: Sure.

20 Q. (BY MS. GOODPASTER) Mr. Nguyen, I have it marked at  
21 the beginning of that interrogatory, but the first page of that  
22 document contains the title of the document, the responses to  
23 the first set. Interrogatory 14.

24 A. Yes.

25 Q. Does that refresh your recollection?

1 A. Yes.

2 Q. And in response to that discovery request, is it true  
3 that MDU stated that it had demonstrated in its 2003 IRP and  
4 2005 IRPs the need for base load capacity beginning in 2007?

5 A. Yes.

6 Q. Are combustion turbines, natural-gas-fired combustion  
7 turbines meant to serve peak or base load demands?

8 A. Combustion turbines are made to serve peak demand.

9 Q. And the MDU 2003 IRP selected peaking capacity, then,  
10 didn't it?

11 MR. SASSEVILLE: For which year, Ms. Goodpaster?

12 Q. (BY MS. GOODPASTER) It was the 2003 IRP. Our  
13 understanding is that there were no base load units selected in  
14 the 2003 IRP; is that correct? It was only combustion  
15 turbines.

16 MR. SASSEVILLE: And my question is for which year are  
17 you talking about the selection?

18 MS. GOODPASTER: The 2003 IRP was for a defined set of  
19 years, so for any of those years.

20 A. It is true that the analysis showed that for our 2003  
21 IRP, the analysis, the computer did not select base load  
22 capacities. It shows that we would, as I talk in my summary,  
23 that we would need to replace AVS II purchase capacity shows we  
24 need to -- the analysis showed that we -- turbine, two turbines  
25 would be needed to replace AVS and other turbines throughout

1 the study period.

2 Q. (BY MS. GOODPASTER) When you say "turbines," are you  
3 saying combustion turbines?

4 A. Yes, combustion turbines, but that comes, after that,  
5 as I said in my summary, we -- because that reliance completely  
6 on turbines, on combustion turbines or natural gas is putting  
7 all our customers' need and requirement and economic for the  
8 state, for our service territory into the fluctuation of the  
9 volatility of the natural gas price and also on uncertainty of  
10 the availability of the natural gas price, of natural gas.

11 So that's why that when we make the decision that is  
12 the policy decision based on the result of that IRP, the 2003  
13 IRP is correct, showing that the least cost is made on natural  
14 gas, but we make the decision based on that IRP and that is  
15 policy decision based on that's why I referred to in my summary  
16 as the best cost and we use the IRP, 2003 IRP to make that  
17 decision.

18 Q. Thank you, Mr. Nguyen. And we established prior to  
19 discussing the IRP in detail here that combustion turbines are  
20 meant to serve peak load as -- peak demand as opposed to base  
21 load demand.

22 A. Yes.

23 Q. So you wouldn't have been proposing combustion  
24 turbines at a capacity factor similar to a base load plant; is  
25 that correct? The combustion turbines that were selected out

1 of the 2003 IRP.

2 A. Rephrase that.

3 Q. Sure. The 2003 -- I'll backtrack. Earlier you stated  
4 that a combustion turbine is meant to serve peak demand, not  
5 base load demand, and so the 2003 IRP selected combustion  
6 turbines and from that and your prior answer, wouldn't that  
7 mean that you selected those turbines, the combustion turbines  
8 to serve peak demand as opposed to base load demand?

9 MR. SASSEVILLE: I'll object to the form of the  
10 question. I believe --

11 MR. SMITH: Did you understand the question,  
12 Mr. Nguyen? I think all she's asking is in the 2003 study, it  
13 had a selection of gas turbines and was the purpose of that to  
14 provide peaking capacity?

15 A. That's correct, based on the assumption in that 2003  
16 IRP, yes.

17 Q. (BY MS. GOODPASTER) For the 2005 IRP, did you run any  
18 model comparing Big Stone II with any other resource options?

19 A. For the 2005 IRP, since the decision is to go to the  
20 base load versus the combustion turbine, we do run the analysis  
21 to compare Big Stone II and other base load alternatives. In  
22 fact one of our alternative is that the next best alternative  
23 is the lignite 21 project in North Dakota.

24 Q. Excuse me, Mr. Nguyen, I wanted to be sure that you  
25 understood that I asked whether you had done any modeling of



1 Big Stone II compared to resource alternatives as opposed to,  
2 for example, a qualitative analysis.

3 A. I guess that my -- from my point of view, I don't  
4 understand the word "modeling" that you do. The modeling for  
5 me is that is the mathematical process, whatever, to express  
6 the characteristics of some form and from that, for an  
7 engineer, I'm hired to make the decision and to make  
8 recommendation, not just to feed in the number of computers and  
9 to say, this is the computer say, so I don't understand the  
10 word "model" that you quite say.

11 Q. I could clarify. In the 2003 IRP, didn't MDU run the  
12 EGEAS model?

13 A. That's correct.

14 Q. Did you run the EGEAS model for the 2005 IRP,  
15 including an examination of the Big Stone II project as it  
16 compared to alternatives?

17 A. No, I did not.

18 Q. I'd like to refer to your -- actually, before I take  
19 you to your testimony, I wanted to clarify one further  
20 discovery response from MDU and this was one that it was  
21 indicated that you were the person who supplied the answer so  
22 you might recall. Do you recall providing answers to joint  
23 intervenors' sixth set of requests for interrogatories and  
24 requests for production of documents that was a fairly recent  
25 set, on April 5th, 2006 set of interrogatories and requests for

1 production of documents in this proceeding?

2 A. So many of them, I may not remember all the dates and  
3 specific.

4 Q. Sure. If I represented to you that we asked in that  
5 sixth set served on April 5th, Interrogatory 38, where we asked  
6 you to refer to Montana's 2 -- Montana-Dakota's 2003 IRP and  
7 wanted to know -- we asked you, has Montana-Dakota's need  
8 changed in any way between the preparation of the 2003 IRP and  
9 the finalization of the 2005 IRP. Do you remember us asking  
10 you that question?

11 A. Yes.

12 Q. And do you recall that your answers -- your answer to  
13 that question was Montana-Dakota's demand needs have not  
14 significantly changed, however, the operating environment and  
15 the energy market have changed. Do you recall that response?

16 A. Yes.

17 Q. And so we just had a discussion about the 2003 IRP  
18 selecting peaking units and the most recent decision to invest  
19 in a base load unit, but it's correct, though, that you said  
20 that the nature of the needs of the company and the customers  
21 have not changed between 2003 and 2005.

22 A. That's correct.

23 Q. Now, I do want to go to your testimony, Exhibit 48,  
24 page 3, lines 11 to 19.

25 A. Is it the rebuttal?

1 Q. Yes, Exhibit 48 I believe is your rebuttal. Have you  
2 found that page?

3 A. Yes.

4 Q. At page 11 and continuing to the bottom of the page --

5 MR. SASSEVILLE: Page 11 or page 3?

6 MS. GOODPASTER: Page 3, line 11, I'm sorry, I  
7 misspoke.

8 Q. (BY MS. GOODPASTER) At line 11 continuing down the  
9 page, you are discussing MDU's recent contract or commitment to  
10 a wind power plant; is that correct?

11 A. Yes.

12 Q. What economic analyses did MDU perform when it was  
13 evaluating whether to purchase that wind capacity and energy to  
14 be constructed in South Dakota?

15 A. That wind capacity is -- we signed a contract first to  
16 start with is that it is we purchased the energy and capacity  
17 from that wind farm because of the PURPA requirement. I don't  
18 remember the acronym, what it is, and we do run those, the  
19 studies, incorporate that into our costing model to determine  
20 the best price that we can negotiate, so it is the production  
21 costing model, PROSYM, P-R-O-S-Y-M.

22 Q. I just want to make sure I understand, Mr. Nguyen, it  
23 was MDU's perspective that it had to purchase the output of  
24 that wind facility under PURPA?

25 A. Yes.

1 Q. And so was there no -- the economic analyses that  
2 would have been done were not to evaluate whether to purchase  
3 it, it would be what price to pay.

4 A. That's correct.

5 Q. Thank you. In that same paragraph on page 3, lines 16  
6 through 19, you state that Montana-Dakota expects to comply  
7 with the Montana statute by purchasing or installing up to an  
8 additional 30 megawatts of renewable power generation by 2015;  
9 is that correct?

10 A. That's correct.

11 Q. When you state -- I want to understand the words you  
12 use here -- in line 18, you say, purchasing or installing up to  
13 an additional 30 megawatts of renewable power, does that mean  
14 any number, 32 megawatts or less?

15 MR. SASSEVILLE: 30 megawatts or less, right?

16 MS. GOODPASTER: What did I say?

17 A. I think that we --

18 Q. (BY MS. GOODPASTER) I meant 30.

19 A. We mean that we are going to -- because we don't know  
20 if it is 30 megawatt is the right number, so probably what we  
21 mean -- I mean is that approximately 30 megawatt.

22 Q. But it could be less than 30 megawatts.

23 A. It could be less, yes.

24 Q. Was this 30-megawatt increment included in what you  
25 provided to Mr. Morlock, who testified yesterday, where he

1 represented that the total amount that the co-owners will be  
2 investing in wind is an amount of 800 megawatts by 2015 to  
3 2020? Were you here yesterday when Mr. Morlock testified?

4 A. Yes.

5 Q. Did you hear that testimony? Don't worry, I'm not  
6 going to go that long. But he stated yesterday that he took  
7 information from each of the co-owners to get to the 800  
8 megawatts number, and so -- do you recall him stating that?

9 A. Yes.

10 Q. And so what I'm wondering is whether this 30 megawatts  
11 of additional renewables was part of what you provided to  
12 Mr. Morlock for him to calculate that 800 megawatts.

13 A. Yes, it was.

14 Q. At line 19 on page 3 again, you state that this 30  
15 megawatts may be wind or other approved renewable power  
16 sources, correct?

17 A. Yes.

18 Q. So providing that number to Mr. Morlock of 30  
19 megawatts would not have been saying that this is 30 megawatts  
20 of wind that MDU intend to add, it may be wind but it may be  
21 other things, correct?

22 A. Yes.

23 Q. And it may be 30 megawatts or it may be less, correct?

24 A. Yes.

25 Q. If you could turn to page 4 of Exhibit 48, lines 8

1 through 17.

2 A. Yes.

3 Q. You are talking about the amount of wind that the MDU  
4 system could reliably accommodate; is that correct?

5 A. Yes.

6 Q. And what studies has MDU performed to determine the  
7 amount of wind that could be integrated into its system?

8 A. Study, depending on how you define study, but what I  
9 just presented in my summary is one cursory study that we did  
10 on the minimum load versus the minimum -- the capacity, that  
11 was one of the study. And if the amount is somewhat like about  
12 20 percent that doesn't fit, then I would have to ask for my  
13 transmission planner to model it and run the transmission  
14 study, which we did not do. But if you ask for any study, that  
15 study is the form of performing some calculations to make the  
16 result, the study that I just presented.

17 Q. So that helps me understand. You mentioned then that  
18 there was no transmission study done for MDU's system, a study  
19 in the sense of the kind of study you would ask your  
20 transmission planners to do, any kind of dispatch analysis or  
21 other transmission study.

22 A. That's correct.

23 Q. Turning to page 5 of Exhibit 48 and lines 11 through  
24 12, it's true, isn't it -- it states there that studies suggest  
25 the Schlissel and Sommer agree on page 10 of the May 26

1 testimony that for system operating considerations, a maximum  
2 ratio of installed nameplate wind capacity system peak would be  
3 in the 15 to 20 percent range; is that correct?

4 A. Yes.

5 Q. What studies, I realize there are different ways of  
6 interpreting the word "studies" and we can try to clarify that,  
7 but what studies suggest a maximum ratio of installed nameplate  
8 wind capacity to system peak would be in the 5 to 20 percent  
9 range? You're referring to studies there, so I assume you had  
10 something specific in mind.

11 A. As Mr. Morlock said, I also read the Xcel, the  
12 statement based on the Xcel IRP study.

13 Q. And so it's from that study that you conclude that the  
14 ratio of wind capacity at system peak would be in the 5 to 20  
15 percent range?

16 A. Yes.

17 MR. SASSEVILLE: 15 to 20 percent?

18 A. 15 to 20 percent range.

19 MR. SASSEVILLE: We will go with 5.

20 MS. GOODPASTER: A typo.

21 Q. (BY MS. GOODPASTER) Could you tell me where in Mr.  
22 Schlissel and Ms. Sommer's May 26th testimony that you refer to  
23 in that statement that they agree that this is a maximum ratio  
24 of wind to peak demand levels? You state that Schlissel and  
25 Sommer agree. Do you have access to their testimony?

1 A. I can't --

2 MR. SASSEVILLE: The reference in his testimony is to  
3 page 10 so if you have your witness's testimony, we can look at  
4 it.

5 MS. GOODPASTER: I have a copy here.

6 MR. SASSEVILLE: The record should reflect the witness  
7 has been shown a copy of Schlissel's prefiled direct testimony;  
8 is that correct, Ms. Goodpaster?

9 MS. GOODPASTER: Yes.

10 Q. (BY MS. GOODPASTER) Could you look at page 10 on the  
11 document that I just showed you and point to where Schlissel  
12 and Sommer agree that the ratio of -- maximum ratio of  
13 installed wind capacity at the system peak is in the 15 to 20  
14 percent range?

15 A. Okay. Moreover, studies and actual operating  
16 experience has shown that fairly high penetration of wind  
17 generation can be integrated to the electricity system up to 20  
18 percent of system peak demand or more without having adverse  
19 impacts on the reliability or stability of electric grid. The  
20 20 percent is the suggested recommendation.

21 Q. But let me clarify, Mr. Nguyen. The passage you just  
22 read said 15 to 20 percent or more; is that correct?

23 A. That's correct.

24 Q. So Mr. Schlissel and Ms. Sommer did not state that the  
25 maximum would be 15 to 20 percent, did they?



1 MR. SASSEVILLE: I'll represent the document speaks  
2 for itself and that his testimony was that that was his  
3 interpretation of their testimony.

4 MR. SMITH: Do I need to rule on anything?

5 MR. SASSEVILLE: Only if you want to, Mr. Smith.

6 MR. SMITH: Okay, I won't.

7 Q. (BY MS. GOODPASTER) Turning to page 6, lines 3 to 15  
8 of your rebuttal testimony, Exhibit 48, you discussed this  
9 somewhat in your summary as well, talking about currently  
10 locational marginal prices in MISO during low load hours are  
11 negative; is that correct?

12 A. That's correct.

13 Q. Wouldn't adding another base load resource that has to  
14 be kept running at minimum levels when loads are low just make  
15 matters worse, MDU would have to sell at a loss with the  
16 addition of a base load unit?

17 A. My calculation that I was included the Big Stone in  
18 there.

19 Q. I'm sorry, which calculation?

20 A. Let me ask you, can you rephrase your question?

21 Q. Sure. We agreed that there are negative locational  
22 marginal prices in MISO during low load hours at present.

23 A. Okay.

24 Q. And if in the future MDU were to add another base load  
25 resource and that base load resource would be kept running at

1 minimum levels even when loads are low, wouldn't MDU be having  
2 to sell that to MISO at the negative prices, essentially  
3 selling at a loss?

4 MR. SASSEVILLE: Excuse me, and your assumption was  
5 with the wind at what level?

6 Q. (BY MS. GOODPASTER) I'm not assuming wind. I'm  
7 assuming current negative locational marginal prices and then  
8 the addition of a base load resource like Big Stone II, that  
9 does have to be kept at minimum levels during those times when  
10 locational marginal prices are negative.

11 A. With the minimum load for Big Stone II were added,  
12 that with all our must-run units would be at the minimum with  
13 the Big Stone II.

14 Q. So MDU would have to inject power or energy into the  
15 MISO market at a loss but it wouldn't be very much, is what  
16 you're saying?

17 A. With or without, I'm not sure -- with or without wind?

18 Q. Without.

19 A. Why we have to -- I don't know, we don't inject. With  
20 Big Stone II, our minimum load would match with the minimum  
21 capacity with Big Stone II, so we don't have to inject any  
22 energy into the MISO market.

23 Q. So it's only if you were adding wind instead of Big  
24 Stone II that you would have to inject energy into the MISO  
25 market?

1 A. Yes.

2 Q. We started out this conversation talking about  
3 off-system sales as a component of your best cost analysis and  
4 you stated to me that your assumption is that those off-system  
5 sales are going to take place in off-peak times, and my  
6 understanding is that we have just talked about the fact that  
7 in off-peak times or low-load levels, locational marginal  
8 prices in MISO are negative. So I'm trying to understand why  
9 the off-system sales and off-peak at negative marginal prices  
10 is a positive opportunity for MDU.

11 MR. SASSEVILLE: I'll object to the form of the  
12 question. I think it misstates his testimony.

13 MS. GOODPASTER: I believe that earlier Mr. Nguyen  
14 stated that the benefit that they were anticipating, MDU was  
15 anticipating or one of the benefits that MDU anticipates is  
16 that it could make off-system sales with Big Stone II in  
17 off-peak periods. He's also stated that in MISO the locational  
18 marginal prices at low load levels or not off-peak times are  
19 negative and I'm trying to understand how those two statements  
20 that he made are consistent. Why is selling surplus energy  
21 into the MISO market at negative marginal prices an  
22 opportunity?

23 MR. SASSEVILLE: And I'll renew my objection because I  
24 don't think he said that the off-system, off-peak sales will be  
25 sold at negative prices or at a loss. I think in fact his

1 testimony was the opposite. He said he believes they would be  
2 sold at a profit.

3 Q. (BY MS. GOODPASTER) Mr. Nguyen, are off-peak times --  
4 aren't minimum load levels coinciding with a negative  
5 locational marginal price?

6 A. They may, but you are talking about two different  
7 things.

8 Q. Okay.

9 A. Off-system sales is when we have to sell them, when we  
10 have a buyer. Someone needs it. And you are talking about the  
11 wind generate a negative when we have wind. I don't think that  
12 any company would look in the sky and wait for the wind to blow  
13 to buy the energy from us. They are two different things, two  
14 different occasions, two different needs from the market.

15 Q. And in the most recent discussion we are having, I'm  
16 not talking about wind power, I'm talking about Big Stone II  
17 and a base load resource and so at some point you are stating  
18 that you are going to have surplus energy to offer at off-peak  
19 times.

20 A. Yes.

21 Q. And you are also stating that it would be a subset of  
22 the off-peak times where locational marginal prices are  
23 positive?

24 A. I said that, correct, but you missed that when no one  
25 wants it, there is no market for it. Only when we use the

1 system without any buyer, we force our energy inadvertently  
2 into the system. But off-peak sale, when we have a seller and  
3 a buyer, that's agreement to use the transmission system, the  
4 payment is from the other, the buyer.

5 Q. So you don't -- you are not -- do you know that you  
6 are going to be able to make surplus sales at this point?

7 A. From our historical record, we will, and I believe  
8 that the decision that we make that we believe that we will  
9 make the margin for our customers to benefit our customers.

10 Q. Mr. Nguyen, is there any analysis supporting MDU's  
11 belief that there will be an opportunity for -- that there will  
12 be surplus sales made from the Big Stone II?

13 MR. SASSEVILLE: Other than the analysis he just  
14 referred to?

15 MS. GOODPASTER: Other than what he just stated, some  
16 quantitative economic analysis.

17 A. I know there was some, but I'm not involved in those  
18 decisions. I cannot tell how the analysis and how deep they  
19 are.

20 Q. (BY MS. GOODPASTER) Mr. Nguyen, do you know who is  
21 responsible for those analyses so that I could follow up at a  
22 future date?

23 A. My vice-president is responsible for the decision for  
24 that.

25 Q. Is that Andrea Stomberg?

1 A. Yes, Andrea.

2 MS. GOODPASTER: That concludes my questions, thank  
3 you, Mr. Nguyen.

4 MR. SMITH: Ms. Stueve, do you have any questions of  
5 Mr. Nguyen?

6 MS. STUEVE: Yes, I do.

7 CROSS-EXAMINATION

8 BY MS. STUEVE:

9 Q. Good morning, Mr. Nguyen. Welcome.

10 A. Morning.

11 Q. It sounded from your cursory summary that you are  
12 familiar or participate in MAPP, M-A-P-P?

13 A. Yes.

14 Q. What does the acronym stand for again?

15 A. Mid-Continent Area Power Pool.

16 Q. Are you familiar with the geographic area MAPP covers?

17 A. Yes. I think that the map was given by Mr. Koegel in  
18 his summary yesterday.

19 MS. STUEVE: Could counsel, pull that map up, please.

20 Q. (BY MS. STUEVE) We heard a lot from various co-owners  
21 coming and presenting the case for need, need for a base load  
22 generation; would you agree?

23 A. Yes.

24 Q. Yes, and you're presenting MDU has a need for base  
25 load generation also.

1 A. Yes.

2 Q. Yes. Okay. Do you have any idea what the estimated  
3 need is projected to be for the MAPP area?

4 MR. SASSEVILLE: For which year, Ms. Stueve?

5 MS. STUEVE: For 2020.

6 A. I'll speak it from the Montana-Dakota's point of view  
7 rather than from MAPP.

8 Q. (BY MS. STUEVE) Okay.

9 A. MAPP is an organization whereby -- it's a power pool,  
10 it's not a company.

11 Q. Right.

12 A. So each individual member, like Montana-Dakota  
13 Utilities, is responsible for itself. So MAPP, in my view, is  
14 that MAPP has nothing to do with determining the need for MAPP  
15 or not. But that's as far as I can tell.

16 Q. Right. And you can't speak as far as the need for  
17 multiple utilities within MAPP as far as what the projected  
18 number for need would be by 2020. That's beyond your scope.

19 A. That's correct.

20 Q. Okay. Thank you. So up on the board there, that  
21 would be the MAPP area, correct?

22 A. That's correct.

23 Q. Are you familiar with the project area of Big Stone  
24 II?

25 A. I know the location of Big Stone II.

1 MS. STUEVE: Okay. Could counsel please pull up the  
2 draft EIS map, Exhibit 53, page 2-62? Did counsel bring 13  
3 copies of the draft EIS?

4 MR. WELK: No, it's in the record. Everybody has got  
5 copies.

6 MS. STUEVE: Do we have a copy to give the witness?

7 MR. SMITH: I got one, Chris.

8 MR. SASSEVILLE: I'm going to object to this line of  
9 questioning based on foundation, first of all, and relevance.  
10 We went through this yesterday and it led to a pretty tight  
11 dead end, so I'm curious what relevance this is.

12 MR. SMITH: Can you give us just a little explanation  
13 of what you are trying to show here, Ms. Stueve?

14 MS. STUEVE: For example, within the defined MAPP  
15 area, if there's a need of, say, 6,300 megawatts in the area,  
16 MAPP area by 2020, for example, to meet that would we need  
17 8,000 megawatts of new generation? And would that concur or  
18 would that lead to the fact that we would have 1,700 megawatts  
19 of line loss? Meaning how do we disperse between the project  
20 area where this base load generation comes from to the broader  
21 area where the need is in the area by 2020?

22 MR. SASSEVILLE: Then I'll object based on foundation  
23 because there's no indication this witness has the knowledge to  
24 answer that question.

25 MR. SMITH: I think the other thing is if I recall,



1 and maybe you will still have a question on this, but I think  
2 Mr. Nguyen just testified that in the MAPP region, it's each  
3 individual utility's responsibility to meet its minimum  
4 resource requirements by itself. That is its responsibility.  
5 Was that your testimony?

6 A. Yes.

7 MR. SMITH: With that said, do you still have a  
8 question regarding this?

9 MS. STUEVE: I do not.

10 MR. SMITH: If you do, go ahead. I'm not trying to  
11 dissuade you, but I think he already kind of answered your  
12 question by stating that the MAPP resource requirements are  
13 company specific, it's their own internal responsibility to  
14 meet those. Is that your testimony? Is that what you said?

15 A. Yes, that's correct.

16 Q. (BY MS. STUEVE) You are saying you can meet your base  
17 load with the Big Stone project II?

18 A. Say the question, what year are you talking about?

19 Q. Your projected base load need.

20 A. In my direct testimony, with Big Stone II, our needs  
21 would be satisfied through 2013 and starting after that we'll  
22 have to look for a new resource addition.

23 MS. STUEVE: Thank you.

24 MR. SMITH: Staff? Is that all you had?

25 MS. STUEVE: Yes. No further questions.

1 MR. SMITH: Staff?

2 MS. CREMER: Staff has no questions, thank you.

3 MR. SMITH: Commissioners, do you have questions of  
4 Mr. Nguyen?

5 VICE-CHAIR JOHNSON: Actually I don't, thanks.

6 CHAIRMAN SAHR: I do not.

7 MR. SMITH: Redirect?

8 MR. SASSEVILLE: Thank you, Mr. Smith.

9 REDIRECT EXAMINATION

10 BY MR. SASSEVILLE:

11 Q. I have just a few. Mr. Nguyen, you were asked a few  
12 questions by Ms. Goodpaster about locational marginal pricing.  
13 Do you recall those questions? The questions related to  
14 off-system off-peak sales, and she interjected into the line of  
15 questioning the concept of locational marginal pricing and the  
16 possibility of selling excess energy at a loss. Do you recall  
17 that?

18 A. Yes.

19 Q. Could you explain the idea of must-run resources?

20 A. A must-run resource is that for -- I would have to go  
21 back to the characteristic of a generating plant. I'll make an  
22 example, like Big Stone II at 600 megawatt, it's not a matter  
23 of bringing up 600 megawatt and running it. It go to steps,  
24 like the first step, in order to keep it running at we call  
25 idle, just like the car running idle, it is the minimum load so

1 that it can be ready to be up and down and each of those --  
2 each of those would be -- the 600 megawatt would have several  
3 blocks of where it is dispatched accordingly and they have  
4 different price in this block. But let's talk about minimum  
5 load. Big Stone for our share I estimate that we would have 40  
6 megawatt out of 160 as the minimum load that must run.

7 Q. And what is the level of your must-run resources at  
8 this point relative to load?

9 A. Including Big Stone II, we would be about at the  
10 minimum load at about 36 percent, about 36 to 40 percent of our  
11 total system peak in 2011.

12 Q. And what would happen if you added to that minimum  
13 level wind generation?

14 A. As I testified in my summary, we have several options.  
15 One is that if we take the wind, we can bring down the must-run  
16 unit and that first option is that the next day we will not  
17 have those must-run units to be back up to serve our customer  
18 when the wind stops blowing. Second, we can just pay for the  
19 wind and just don't take it, stop the wind generation. The  
20 third one is that we can dump the wind into the MISO market  
21 with no buyers, no one need it and pay for the negative LMP.

22 Q. It's negative for what reason, is it because there's  
23 no taker, no buyer on the market and there's an adverse impact  
24 on the transmission system?

25 A. Yes, that's correct.

1 Q. And that's what you meant when you explained that by  
2 putting this energy into the market, you would sustain a loss  
3 or pay a penalty, correct?

4 A. Not only we have to sustain a loss, but we have to pay  
5 and we lose another thing and have to pay in addition to the  
6 purchase price that we have to pay for nothing.

7 Q. Let me ask about your must-run resources. Will Big  
8 Stone II be your least cost must-run resource?

9 A. Yes, it will be.

10 Q. And was the testimony that you gave in your summary  
11 based upon the assumption that Big Stone II would be on line  
12 and your least cost must-run resource?

13 A. Yes, that's correct.

14 Q. And within your calculations, your analyses about the  
15 effect of wind, was there room to accommodate a certain amount  
16 of wind generation without incurring these locational marginal  
17 pricing penalties?

18 A. We estimate that as a normal system we can accommodate  
19 approximately 10 percent of the wind capacity.

20 Q. And based on the recommendation of Mr. Schlissel and  
21 Ms. Sommer, would that amount be exceeded?

22 A. Yes.

23 Q. Now, we talked about a different subject that sounds  
24 like it's related and that is off-peak off-system sales of  
25 energy. Do you recall that?

1 A. Yes.

2 Q. And explain who will benefit as between shareholders  
3 and customers or consumers of MDU from the revenues derived  
4 from those off-peak off-system sales.

5 A. In North Dakota now where we have what they call  
6 margin sharing mechanism whereby the customers reap 85 percent  
7 of the margin, of the benefits, the shareholder is allowed only  
8 15 percent of the benefit.

9 MR. SASSEVILLE: Thank you.

10 MR. SMITH: Does that conclude redirect?

11 MR. SASSEVILLE: Yes, sir.

12 MR. SMITH: Do you have any recross in response to  
13 that?

14 MS. GOODPASTER: Just one question, Mr. Smith.

15 RE CROSS-EXAMINATION

16 BY MS. GOODPASTER:

17 Q. In response to Mr. Sasseville, his redirect, you were  
18 clarifying that it's with Big Stone II that MDU would be at a  
19 minimum load level, 36 percent of the time; do I understand  
20 that testimony?

21 A. Yes.

22 Q. And then your further conclusion is adding wind to  
23 that scenario which already includes Big Stone II; is that  
24 correct?

25 A. Adding wind how much?

1 Q. Well, let me be more clear. You stated in talking to  
2 Mr. Sasseville that MDU's concern would be adding wind and the  
3 impact that that would have on the 36 percent number; isn't  
4 that correct?

5 A. Yes.

6 Q. So that tells me that you are concerned if you added  
7 Big Stone II and added a Schlissel/Sommer, for example, amount  
8 of wind, that that would cause a problem.

9 A. That's correct.

10 Q. And you are aware that joint intervenors and  
11 Mr. Schlissel and Ms. Sommer are not recommending that Big  
12 Stone II be built and add any amount of -- any particular  
13 amount of wind.

14 A. Can you say that again?

15 Q. Sure. Do you agree with me that joint intervenors and  
16 Mr. Schlissel and Ms. Sommer are not taking a position that Big  
17 Stone II be built and to that add any amount of any particular  
18 amount of wind?

19 A. That's correct. In my cursory analysis, I did not  
20 take into account that Mr. Schlissel and Ms. Sommer also  
21 recommended in conjunction with the wind the IGCC, I think the  
22 combined cycle gas turbine; is that correct?

23 Q. Mr. Nguyen, I think that Mr. Schlissel and  
24 Ms. Sommer's testimony is providing a variation perhaps on the  
25 Burns & McDonnell analysis that was assuming wind and gas.

1           A.    And my cursory analysis doesn't take into account that  
2 gas part capacity also.

3           MS. GOODPASTER:   Okay, thank you.

4           MR. SASSEVILLE:   I have nothing further.

5           MS. STUEVE:   I have been able to formulate a more  
6 general question I do believe, one.

7           MR. SMITH:   Go ahead.

8                                REXCROSS-EXAMINATION

9           BY MS. STUEVE:

10          Q.    Has MDU in particular looked at the pros and cons to  
11 meeting need locally versus choosing a more distant central  
12 station?

13          MR. SASSEVILLE:   I'll object.   Could you be more  
14 specific when you say meeting need locally versus choosing a  
15 more distant central station?

16          MS. STUEVE:   Meaning closer to MDU, centrality of MDU,  
17 for example, of your base.

18          MR. SASSEVILLE:   Your question assumes that it's  
19 located somewhere other than in the center of their service  
20 territory.   I believe the testimony has been that it is in the  
21 center of their service territory.

22          Q.    (BY MS. STUEVE)   Big Stone II is in the center of your  
23 service territory?

24          A.    No, I don't think so, but it is the best location for  
25 us.   We are looking at a closer place, that's the Lignite

1 Vision 21 project.

2 Q. Pardpm? The --

3 A. Lignite Vision 21 project, which will be a lignite  
4 coal-fired plant at 175 megawatt and if built, it would be  
5 built near Headinger, North Dakota, but it is our next best.

6 Q. Okay.

7 A. So we look at other alternatives.

8 MS. STUEVE: Thank you.

9 MR. SMITH: Now any redirect?

10 MR. SASSEVILLE: No.

11 EXAMINATION

12 BY VICE-CHAIR JOHNSON:

13 Q. I have a question in response to redirect from  
14 Mr. Sasseville. Mr. Nguyen, I think in your testimony you  
15 mentioned that of the must-run resources Big Stone II would be  
16 the lowest cost; is that correct?

17 A. I would say one of the lowest cost. I don't have the  
18 number in front of me to say one way or another because Big  
19 Stone II cost is still -- are still working on, we don't have  
20 the final costs of Big Stone, that's why I cannot say it  
21 definitely. I kind of misspoke that way.

22 Q. Okay. In your direct testimony, you mentioned that  
23 MDU has 366 megawatts of coal-fired steam units. Are any of  
24 those supercritical pulverized coal units?

25 A. I'm not sure about that. I am not a power plant



1 expert.

2 VICE-CHAIR JOHNSON: Thank you very much.

3 MR. SASSEVILLE: No redirect.

4 MR. SMITH: Thank you, you may step down. I've had a  
5 request that we take a short break from counsel. Are the  
6 commissioners amenable to that? It's a quarter to 11:00. How  
7 long do you want to take? Ten minutes, 15 minutes? Shall we  
8 say ten and then assume we'll really be back? Why don't we  
9 take a ten-minute break.

10 (Whereupon, hearing was in recess at 10:45 a.m. and  
11 subsequently reconvened at 11:00 a.m., and the following  
12 proceedings were had and entered of record:)

13 MR. SMITH: We're back on the record following our  
14 morning recess. Applicants, you may proceed with your next  
15 witness.

16 MR. SASSEVILLE: Thank you, Mr. Smith. The applicants  
17 call Robert Davis.

18 Thereupon,

19 ROBERT DAVIS,

20 called as a witness, being first duly sworn as hereinafter  
21 certified, testified as follows:

22 DIRECT EXAMINATION

23 BY MR. SASSEVILLE:

24 Q. Good morning, Mr. Davis.

25 A. Good morning.

1 Q. Would you state your name and spell it for the record,  
2 please?

3 A. Robert L. Davis, R-O-B-E-R-T, L. D-A-V-I-S.

4 Q. You are senior director with R.W. Beck, Inc.?

5 A. That's correct.

6 Q. What is R.W. Beck, Inc.?

7 A. R.W. Beck is a nationally-recognized engineering  
8 consulting firm headquartered in Seattle, Washington.

9 Q. What was R.W. Beck Inc.'s role in this proceeding?

10 A. We were retained by Central Minnesota Municipal Power  
11 Agency to review a load forecast and to review the generation  
12 expansion planning analysis.

13 Q. Have you prepared or caused to be prepared rebuttal  
14 prefiled testimony in this case?

15 A. I have.

16 Q. And what was the purpose of your preparation of that  
17 rebuttal testimony?

18 A. It was to review the evaluations that have been  
19 performed by CMMPA and to provide an updated or revised  
20 analysis to investigate resource expansion and need for CMMPA.

21 Q. Were you in charge of or did you supervise the work  
22 that was done in that regard?

23 A. I did.

24 Q. Is that work reflected in Exhibit 47?

25 A. It is.

1 Q. And that's in front of you?

2 A. Correct.

3 Q. Do you have any corrections, revisions or changes to  
4 any part of Exhibit 47 which, for the record, includes Exhibits  
5 A, B and C?

6 A. I have one substantive change to Exhibit C of Exhibit  
7 47.

8 Q. Could you first identify the page that the change is  
9 on?

10 A. It's on page ES-2. It is the first bulleted item on  
11 that page, ES-2 is in the second page of the executive summary.

12 Q. Which is Exhibit C to Exhibit 47?

13 A. Yes. That first bulleted item, last sentence should  
14 read, this amount of wind capacity is approximately equal to  
15 the incremental need necessary to satisfy the renewable energy  
16 objective of the Big Stone II members for 2012.

17 Q. Are there any other changes, revisions or corrections?

18 A. No. Nothing substantive.

19 Q. Mr. Davis, if I were to ask each of questions set  
20 forth in Exhibit 47 this morning, would your answers be the  
21 same?

22 A. They would.

23 MR. SASSEVILLE: At this time applicants offer into  
24 admission Exhibit 47.

25 MR. O'NEILL: No objection.

1 MS. STUEVE: No objection.

2 MS. CREMER: No objection.

3 MR. SMITH: Applicants' Exhibit 47 is received into  
4 evidence.

5 EXHIBITS:

6 (Applicants' Exhibit No. 47 received into evidence.)

7 Q. (BY MR. SASSEVILLE) Mr. Davis, could you provide  
8 first a quick summary of your credentials, your educational,  
9 employment and professional experience and then present your  
10 written summary for the commission?

11 A. Sure. I hold a bachelor of science degree from the  
12 University of Florida, Gainesville, Florida where I studied  
13 essentially an interdisciplinary study of alternative energy  
14 technologies and engineering mathematics. After that I was  
15 hired by Gainesville Regional Utilities where I was responsible  
16 for analyzing and managing and directing their demand-side  
17 management programs. Joined R.W. Beck in 1990 where since that  
18 point in time I have been running numerous resource planning  
19 evaluations, financial evaluations, market studies, et cetera.

20 I would like to follow up, too, that I've got  
21 testimony experience in several cases before the State of  
22 Florida, State of Texas, State of South Carolina and affidavit  
23 filing before FERC. These issues that were covered in those  
24 filings relate to integrated resource planning, certificate of  
25 need, demand-side needs assessments and market power related

1 issues.

2           Turning to a summary of the evaluation I did for  
3 CMMPA, we performed a load forecast and resource expansion  
4 analysis for the members specifically of CMMPA that were  
5 participating in the Big Stone Unit II project as well as the  
6 City of Willmar. What we found based upon our evaluation of a  
7 load forecast which was performed as an econometric load  
8 forecast, that net energy for load and peak demand for these  
9 entities were projected to grow at approximately 1.5 percent  
10 over the next 20 years. Reserve margins for these entities  
11 were anticipated to fall below 10 percent by 2011 when the Big  
12 Stone II Unit were not available.

13           With regard to the resource plan and the results of  
14 the analysis we performed, the resource expansion analysis  
15 directly addressed renewable energy and DSM resources as part  
16 of the evaluation. The least cost plan that came out of this  
17 analysis was that CMMPA should add 30 megawatts to the Big  
18 Stone II Unit in 2011 plus an additional 10 megawatts of wind  
19 by 2011. Additional base load capacity additions beginning in  
20 2019 and continuing every two years thereafter were also found  
21 to be coal-type resources. Additional DSM beyond those levels  
22 required to meet the conservation improvement requirements of  
23 the State of Minnesota were not found to be cost effective.  
24 That's a brief summary of my testimony.

25           MR. SASSEVILLE: Thank you. Mr. Davis is now

1 available for cross-examination.

2 MR. SMITH: Please proceed, intervenors.

3 MR. O'NEILL: Thank you, Mr. Smith.

4 CROSS-EXAMINATOIN

5 BY MR. O'NEILL:

6 Q. Good morning, Mr. Davis.

7 A. Morning.

8 Q. Mr. Davis, was R.W. Beck commissioned to do a study on  
9 behalf of CMMPA in 2006?

10 A. Yes.

11 Q. And as I understand it, they had committed to BS II in  
12 2005.

13 A. That is my understanding.

14 Q. Do you think it may have been more prudent for them to  
15 have commissioned you prior to their commitment to the Big  
16 Stone II?

17 MR. SASSEVILLE: Object, it's argumentative.

18 MR. SMITH: Overruled.

19 A. It is my understanding that CMMPA did hire R.W. Beck  
20 to perform evaluations related to the Big Stone II asset. The  
21 analysis that we did here was merely a more refined analysis,  
22 which I guess could be described as more analytically  
23 defensible.

24 Q. (BY MR. O'NEILL) Okay. Looking at the DSM programs  
25 that were discussed, did we read your information correctly in

1 which we understood that there was a 28 cent per kilowatt hour  
2 or the average of the BS II CMMPA members, the DSM programs  
3 that they are currently offering, is that what the cost to the  
4 DSM programs were as you evaluated them?

5 A. Yes. Not all of the members have that information  
6 available, nor are these members required to file that level of  
7 information with the State of Minnesota. Based upon the  
8 members who do have information available on both program cost  
9 and energy savings, we estimated that to be the average cost of  
10 DSM programs for the CMMPA members.

11 Q. In coming up with that figure, we understand that you  
12 didn't consider DSM programs other than those that had already  
13 been offered by the CMMPA members; is that true?

14 A. That's correct.

15 Q. All right. What were the DSM programs that you were  
16 using as you understood in coming up with that figure?

17 A. It included a combination of programs related to  
18 appliance rebates, compact fluorescent lighting rebates, as  
19 well as load management programs.

20 Q. As it relates to the load management programs, what  
21 percentage of the cost was related to the load management  
22 programs?

23 A. We are looking here at merely the incremental program  
24 costs that are reported by the members on a year-to-year basis.

25 Q. So do you have an ability to quantify out of the DSM

1 programs you had what amount of cost was attributable to the  
2 load management programs?

3 A. Not at this podium at this time, no.

4 Q. A percentage, I'm not looking for an exact figure, but  
5 some type of your best estimate that we could use to understand  
6 its relation to the other DSM programs?

7 A. Forced to guess, I would say somewhere in the  
8 neighborhood of a third.

9 Q. Okay. In hearing your background and your testimony,  
10 you had described a wide array of energy-related planning  
11 services that you and your company provide; is that true?

12 A. Correct.

13 Q. Do you currently advise clients regarding CO2  
14 regulatory costs?

15 A. Personally, no.

16 Q. How about your company?

17 A. Yes.

18 Q. And can you tell us what, if anything, your company  
19 does provide to its clients in regard to CO2 regulatory costs?

20 MR. SASSEVILLE: I'll object, this is beyond the scope  
21 of his rebuttal testimony.

22 MR. SMITH: Do you have a response?

23 MR. O'NEILL: Beyond the scope of his rebuttal  
24 testimony, I believe that it's related to the issue of the  
25 effectiveness of alternatives that have been -- the cost



1 effectiveness that have been raised in his testimony.

2 MR. SMITH: I'll let him answer.

3 A. Could you restate the question, please?

4 Q. (BY MR. O'NEILL) Sure. Can you tell me what R.W.  
5 Beck currently advises its clients in regard to CO2 regulatory  
6 costs?

7 MR. SASSEVILLE: I'll object also for lack of  
8 foundation. He's made the leap that Mr. Davis knows what his  
9 company does for all of its clients in this particular area.

10 MR. O'NEILL: I'm asking for his personal knowledge.

11 MR. SMITH: If you don't know, you don't have to feel  
12 uncomfortable about just saying you don't know if you don't  
13 know.

14 A. I could at least say that we recommend to clients that  
15 the price for CO2 at this point in time is speculative. When  
16 we do offer up a price, we tend to rely upon, either for an  
17 evaluation or to just offer insight for clients, we rely upon  
18 information that has currently been published from others in  
19 the industry, including bills that have been put forth. Most  
20 of our numbers are somewhere in the neighborhood of about five  
21 dollars a ton.

22 Q. (BY MR. O'NEILL) How about the wind production  
23 credit, did you use a wind production credit number in the  
24 generation, expansion analysis you performed for CMMPA in this  
25 case?

1           A.    We assumed that all the assets that we were modeling  
2 here were to be owned or part owned by CMMPA and since CMMPA is  
3 a publicly-owned entity, even if there was a tax credit in this  
4 case, they would not be able to take advantage of it.

5           MR. O'NEILL:   Very good.   Thank you.   That's all the  
6 questions I have.

7           MR. SMITH:    Ms. Stueve?

8           MS. STUEVE:   No questions.

9           MR. SMITH:    Staff?

10          MS. CREMER:   Staff has no questions, thank you.

11          MR. SMITH:    Commissioner questions?

12          COMMISSIONER HANSON:   No.

13          VICE-CHAIR JOHNSON:   No.

14          MR. SMITH:    Redirect?

15          MR. SASSEVILLE:   I have no redirect, thank you.

16          MR. SMITH:    You may step down, Mr. Davis.   Thank you.

17   Are you prepared with your next witness?

18          MR. SASSEVILLE:   Yes, we are.   We are going to swap  
19 out lawyers here if you don't mind.

20          MR. SMITH:    That's fine.

21          MR. SASSEVILLE:   While we are waiting I'd like to  
22 introduce Mr. Peter Glaser, who will be the attorney for the  
23 applicants who will be conducting the examination and  
24 introducing witnesses Daniel Klein and Thomas Hewson.   This is  
25 Mr. Glaser to my left.

1 MR. SMITH: Thank you. Welcome, Mr. Glaser. Do you  
2 need a second to get organized there?

3 MR. GLASER: I'm well-organized, ready to go. I even  
4 have the right glasses with me, which is the most important  
5 thing. I am Peter Glaser. We have Daniel Klein as our next  
6 witness.

7 VICE-CHAIR JOHNSON: Mr. Glaser, if I can interrupt,  
8 try to keep the microphone as close to your mouth as possible.  
9 We have had some people on the Internet ask us to speak up.

10 MR. GLASER: That sounds good?

11 Thereupon,

12 DANIEL KLEIN,  
13 called as a witness, being first duly sworn as hereinafter  
14 certified, testified as follows:

15 DIRECT EXAMINATION

16 BY MR. GLASER:

17 Q. Mr. Klein, can you please state your name for the  
18 record and spell it, please?

19 A. My name is Daniel E. Klein, D-A-N-I-E-L, middle  
20 initial E, last name is spelled K-L-E-I-N.

21 Q. And do you have in front of you a document entitled  
22 prefiled rebuttal testimony of Daniel E. Klein, dated June 9th,  
23 2006 and premarked as Applicants' Exhibit 31?

24 A. Yes, I do.

25 Q. And was that exhibit prepared by you or under your

1 supervision?

2 A. Yes, it was.

3 Q. And as you are under oath today, if I asked you the  
4 questions that are contained in this exhibit, would you provide  
5 the answers that are set forth?

6 A. Yes, I would.

7 MR. GLASER: And I guess at this point we should  
8 tender the -- tender the exhibit and move for admission of the  
9 exhibit.

10 MR. SMITH: Is he going to have any corrections at  
11 all?

12 MR. GLASER: No.

13 MR. SMITH: The exhibit has been offered into  
14 evidence. Is there an objection?

15 MS. GOODPASTER: No objection.

16 MR. SMITH: Applicants' Exhibit 31 is received into  
17 evidence.

18 EXHIBITS:

19 (Applicants' Exhibit No. 31 received into evidence.)

20 Q. (BY MR. GLASER) Mr. Klein, do you have a summary  
21 prepared of the Exhibit 31?

22 A. Yes, I do.

23 Q. And at this point I would ask you to provide that  
24 summary and also providing a summary of your background and  
25 credentials.

1           A.     Okay.  Thank you.  I'm currently president of  
2 Twenty-First Strategies, an energy and environmental consulting  
3 firm.  I have 30 years plus of consulting experience in this  
4 area, working for government agencies, electric power  
5 companies, industry association, NGOs and others.  The first 20  
6 years of that experience was with a company now called ICF  
7 Consulting, at various points in time referred to as ICF, Inc.  
8 or ICF Resources.  In 1995 I founded Twenty-First Strategies to  
9 do similar type work but with a personally saner lifestyle.

10                 Educationally, I have a bachelor's degree in -- a  
11 bachelor of science degree in urban studies and systems  
12 analysis from MIT and I have an MBA from the Stanford graduate  
13 school of business.  My testimony today concerns the concept of  
14 risk in planning electric generation resources.  Some in this  
15 proceeding have spoken already about potential future  
16 greenhouse gas regulation, but my testimony tries to point out  
17 that there are also significant risks that would result from  
18 not constructing Big Stone II station and instead relying upon  
19 other forms of electric generation.

20                 A decision not to construct Big Stone II would likely  
21 lead to increased reliance on electric generation fueled with  
22 natural gas.  In most parts of the U.S., including the MAPP  
23 region, natural gas combined cycle plants have dominated recent  
24 capacity additions.  Large scale additions of new nuclear  
25 capacity or hydropower are unlikely at this time.  Doing

1 nothing would effectively be a decision to buy more off the  
2 grid, which on the margin is mostly gas fired.

3           A renewable resources and wind power could substitute  
4 for some of the generation that Big Stone II could produce but  
5 because these resources are intermittent and not dispatchable,  
6 they make only a limited contribution to meeting capacity  
7 needs. These intermittent resources require backup  
8 capabilities such as natural gas before most of the capacity  
9 could be considered dependable.

10           Natural gas prices are quite volatile, they react  
11 dramatically to events locally and around the world. Coal  
12 prices, on the other hand, are based much more on domestic  
13 mining and transportation costs and they are generally far less  
14 volatile than oil or gas prices. Because of this, regions that  
15 have more coal-fired power in their generation mix tend to have  
16 more stable power rates. And as I'll discuss in a minute,  
17 higher fuel prices and price volatility are linked to adverse  
18 health impacts.

19           Price spreads between fuels have been increasing. The  
20 chart on the left here, the chart on the left shows average  
21 delivered fuel prices for utilities since 1973. Oil and gas  
22 prices, the two lines in the middle of that left-hand graph,  
23 have fluctuated greatly and in recent years have been climbing  
24 again. But while oil and gas prices have soared, coal prices  
25 have been much more restrained. Since the 1980s, coal prices

1 have generally trended downward as efficiency gains have  
2 continued to reduce costs on this cost-based commodity.

3           Because of these trends, the forecasted price  
4 differential between coal and natural gas has been widening,  
5 weakening natural gas's ability to be a competitive long-run  
6 fuel for power generation.

7           On this slide, the chart on the right looks at  
8 forecasts of fuel prices made by the U.S. Energy Information  
9 Administration over recent years. Each unit along the bottom  
10 line indicates another year of forecasting, starting with the  
11 forecast that EIA made in 1998 and continuing up to this year's  
12 annual energy outlook 2000. What's plotted on this chart is  
13 EIA's forecast of fuel prices delivered to electric utilities  
14 in the year 2020. The bottom line for coal shows that over the  
15 last eight years, price forecasts have been at close to rock  
16 solid as you can see.

17           Gas prices in the middle show that in each and every  
18 year since EIA started forecasting for 2020, the outlook for  
19 gas prices has been higher and higher.

20           My testimony also examined the volatility of energy  
21 prices as seen in historical fuel prices, data from the energy  
22 futures markets and longer term energy price forecasts. Each  
23 of these data sets confirms the greater volatility of natural  
24 gas prices and therefore its greater price risk relative to  
25 coal. This particular chart graphs prices for natural gas

1 futures. For the gas contracts that ended in May 2006, future  
2 prices over the trading period, which goes back to 2003, have  
3 fluctuated over a huge range, from less than \$4 a million BTU  
4 to more than \$10 a million BTU.

5 This volatility in natural gas prices creates price  
6 risks for electricity generators. Let's assume for the sake of  
7 illustration that if instead of coal at Big Stone II, 600  
8 megawatts of natural gas combined cycle was built. Each change  
9 in gas prices of only one penny per million BTU would change  
10 annual costs by about \$300,000, and if natural gas priced  
11 futures are uncertain by a dollar a million BTU or more, which  
12 as we have seen happens often, then total costs for a gas  
13 alternative could vary by tens of millions of dollars annually.

14 Higher fuel prices mean higher costs for generating  
15 power and higher rates for the customers. For South Dakota  
16 consumers, income that's diverted into higher power bills is no  
17 longer available to meet other household uses. With less  
18 household income, other activities must be curtailed, including  
19 some that would have promoted better health and safety. This  
20 in turn leads to a greater chance of premature death. There is  
21 a close measurable relationship between household income and  
22 health.

23 Some have described this effect as wealthier and  
24 healthier. I'm not saying this wealthier and healthier effect  
25 is a good thing, I'm not saying it's the way things should be,



1 it just is. It's been well documented over decades of research  
2 around the world, while we know that impoverished countries  
3 have shorter life spans than developed nations, this effect can  
4 also be seen within prosperous nations such as the U.S.

5 This chart uses data and projections from the U.S.  
6 Census Bureau. It plots the average life expectancy of  
7 newborns in each state against that state's average household  
8 income. On this chart, each single dot represents a state, how  
9 far to the right it is indicates the average household income  
10 and how far up it is represents the average life span. The  
11 upward trend among the dots, that is, among the states, is  
12 clear. Even in the prosperous U.S., higher household income is  
13 correlated with longer life expectancy.

14 For the population to be served by Big Stone II, two  
15 additional factors exacerbate this sensitivity to fuel prices  
16 and volatility, suggesting that the potential impacts on  
17 health, safety and longevity would be greater than what  
18 national averages would suggest. First, for most of the  
19 counties to be served by Big Stone II, there is a household  
20 income that is lower than the national average. Lower-income  
21 families already must spend a greater percentage of their  
22 household earnings to cover energy-related expenditures.  
23 Further, lower-income families are more at risk than  
24 higher-income families when income is reduced. As such, they  
25 get hit twice, they incur higher health and mortality risk when

1 higher power costs reduce the remaining household income.

2           The second factor is that households in South Dakota  
3 and other states in the west north central have higher than  
4 average consumption of natural gas and petroleum in the  
5 remaining household energy uses. This is probably largely  
6 related to higher winter heating needs. So if natural gas is  
7 also used instead of coal at Big Stone II, overall fuel supply  
8 diversity is reduced. Households would then be hit twice, once  
9 in the direct consumption of fuel and again in their use of  
10 natural-gas-fueled electricity. Hence, using coal such as Big  
11 Stone II would not only be less volatile as a power generation  
12 source, but would also help to moderate price spikes in other  
13 parts of the family's energy budget.

14           That's my introductory statement, I thank you for your  
15 attention.

16           MR. GLASER: The witness is available for  
17 cross-examination.

18           MR. SMITH: Joint intervenors, are you prepared to  
19 start?

20           MS. GOODPASTER: More or less.

21           MR. SMITH: Please proceed.

22                                   CROSS-EXAMINATION

23 BY MS. GOODPASTER:

24           Q. Thank you, Mr. Smith and good morning, Mr. Klein.

25           A. Good morning.

1 Q. Turning to your testimony, Exhibit 31, I'm just  
2 looking at the table of contents to begin with, just so that  
3 you understand how I'm categorizing different parts of the  
4 testimony. The second -- Roman II on your table of contents,  
5 have you gotten to that page? Alternatively, you could turn to  
6 page 7 and get the same information.

7 A. This is in the exhibits?

8 Q. It's the prefiled testimony, your rebuttal testimony  
9 is marked as Exhibit 31.

10 A. Okay.

11 Q. So I was looking at the table of contents for your  
12 testimony.

13 A. And you're looking at page 7 now?

14 Q. Sure, we can look at page 7. Roman No. 11, Section  
15 No. 2 is titled volatility of fossil fuel prices, do you see  
16 that?

17 A. Yes, I do.

18 Q. This section of your testimony is analyzing volatility  
19 of energy prices of fossil fuel energy prices; is that correct?

20 A. Yes, it is.

21 Q. And the comparison is between coal, natural gas and  
22 petroleum?

23 A. Yes, it is.

24 Q. Are you familiar or have you read any of the parties',  
25 specifically joint intervenors' testimony, in this proceeding?

1 A. I have read it, yes.

2 Q. Isn't it true that joint intervenors and in fact no  
3 other party to this proceeding is proposing that 600 megawatts  
4 of natural gas be substituted for Big Stone II?

5 A. That's my understanding now. When I read the  
6 testimony, there were several pages devoted to looking at  
7 various alternatives of natural gas and/or wind, and I  
8 understand now from reading the surrebuttal that that was  
9 described as simply an examination and not a recommendation.  
10 I'm not clear what the recommendation is and I'm not aware of  
11 any recommendations by which this base load need could be met  
12 without using oil or gas in lieu of coal. So my testimony  
13 looked at what is typical, what is dominant practice in the  
14 United States where excess capacity is, and it's by and large  
15 for most of the country a given that if you don't have coal,  
16 natural gas is going to be on the margin.

17 Q. Okay. So your assumption is, for your comments in  
18 this proceeding is that the point of reference is replacing Big  
19 Stone II with 600 megawatts of natural gas?

20 A. Could you rephrase that? I'm not quite clear what  
21 your question was.

22 Q. My question is whether your testimony and your  
23 comments regarding Big Stone II assume that the alternative to  
24 600 megawatts of Big Stone II is 600 megawatts of natural gas.

25 A. It was not that specific. My testimony was that if

1 you don't have Big Stone II, the capacity and generation is  
2 going to be made up from somewhere and on the margin, that's  
3 going to include substantial amounts of natural gas and perhaps  
4 petroleum.

5 Q. But not necessarily 600 megawatts?

6 A. I did not make a specific thing. I used 600 megawatts  
7 just for illustration to show what the price impact would be of  
8 uncertainty in natural gas prices, where one penny a million  
9 BTU is \$300,000 a year.

10 Q. Going to your summary that you just presented, if you  
11 could look at page 3 of your summary, you presented two charts,  
12 this is continuing in the topic of relative volatility of  
13 fossil fuel prices, correct?

14 A. Yes.

15 Q. In these historical and forecasted fuel prices in  
16 these two charts, did you include transport costs of coal in  
17 the costs for coal, the lowest line with squares on it on the  
18 graphs?

19 A. Yes, these data sources both are from the U.S. Energy  
20 Information Administration. The historical data is the U.S.  
21 average for what is reported by electric utilities for  
22 delivered fuel costs, so they include transport costs to the  
23 respective plants. For the forecast, that comes out of their  
24 modelings as reported in their annual energy outlook, and again  
25 it's defined as the fossil fuel prices delivered to electricity

1 generators.

2 Q. I don't know if you were -- you probably just came in  
3 yesterday and may not have been here to hear testimony or seen  
4 the record where some of the co-owners have stated that their  
5 rail transport costs are I think one of them said four times  
6 the average. Are you aware of that?

7 A. I'm not aware of the testimony, I'm not sure what four  
8 times the average means, four times their own average?

9 Q. I believe it would be something similar to your  
10 national U.S. average that you are talking about here.

11 MR. GLASER: I'm going to have to object to this  
12 witness testifying about testimony that he was not here for and  
13 that you are now summarizing.

14 MR. SMITH: I think I'll sustain it. And can you get  
15 at it a different way?

16 MS. GOODPASTER: I can move on.

17 Q. (BY MS. GOODPASTER) On page 6 of your summary, the  
18 wealthier is healthier slide, do you know what the statistical  
19 correlation or R value of the life expectancy and average  
20 household income is for this data?

21 A. I have not done that calculation and to my knowledge,  
22 these numbers have not been put together before. They are all  
23 by the U.S. Census Bureau, both the projections and the  
24 historic data.

25 Q. So you haven't -- you said you haven't done a

1 statistical analysis of the correlation, so you can't tell me  
2 whether this is a statistically significant relationship here?

3 A. I did not do that analysis. I don't want to be in a  
4 position of saying if you got \$5,000 more, you are going to  
5 live -- it's subject to a lot of misinterpretation. The broad  
6 pattern to me was visually clear. I suspect strongly if we did  
7 the R values, they would prove to be statistically significant.

8 Q. I'd like to turn to -- have you turn to page 30 of  
9 your rebuttal testimony, Exhibit 31, page 30, line 8. You are  
10 referencing there a 2002 report that you prepared?

11 A. That's correct.

12 Q. And that report is titled mortality reductions from  
13 use of low-cost coal-fueled power and analytical framework,  
14 correct?

15 A. That's correct. To be precise, I was lead author of  
16 that report but I did have a co-author.

17 Q. Yes, and I did notice that, thank you. Has this  
18 report been published in any academic journals?

19 A. The report was peer reviewed and it's available --  
20 it's been made freely available on the Internet.

21 Q. But it's not been published in any peer-review  
22 journals?

23 A. No, but as I said, it was peer reviewed prior to  
24 publication or prior to being made available. The peer  
25 reviewers are considered national names in their respective

1 fields. There's James Hammitt, who is associate professor of  
2 economics and decision sciences at the Harvard School of Public  
3 Health and Detlof von Winterfeldt is associate dean for faculty  
4 affairs and research at the School of Policy Planning and  
5 Development at the University of Southern California.

6 Q. You do reference in this same paragraph, line 17 of  
7 page 30, a Web site where your report can be downloaded.

8 A. That's correct.

9 Q. And that Web site is Center for Energy and Economic  
10 Development or CEED, correct?

11 A. That's correct. The report can also be downloaded on  
12 a few other Web sites, too, but this seems to have the best  
13 download speed.

14 Q. Okay. Would you agree that that organization, that  
15 organization being CEED, describes itself as a nonprofit group  
16 dedicated to protecting the viability of coal-based  
17 electricity?

18 A. I know that the group is comprised of a number of  
19 members. I don't know if that's its specific mission statement  
20 or not.

21 Q. So you haven't seen that statement on the Web site  
22 that you reference?

23 A. Not that I recall.

24 Q. Do you have any reason to disagree with me if I  
25 represented to you that the Web site for CEED describes that



1 organization as a nonprofit group dedicated to protecting the  
2 viability of coal-based electricity?

3 MR. GLASER: I object on the grounds of relevance.  
4 I'm not sure what the relevance is to any of his testimony that  
5 this particular group decided to put his report on their Web  
6 site, among other groups that have put the report on their Web  
7 site.

8 MS. GOODPASTER: Actually, I think it is going to be  
9 clearly relevant in a moment.

10 MR. SMITH: I guess in addition to the relevance, I  
11 guess if he hasn't seen it, that was my only issue, how can he  
12 agree or disagree? He has no basis for -- at least the  
13 implication is that if he disagrees, that somehow means it's on  
14 there.

15 MS. GOODPASTER: How about I go to my next question.

16 MR. SMITH: Please.

17 Q. (BY MS. GOODPASTER) I did download your study from  
18 the CEED Web site. And you note in a footnote on the first  
19 page of that study that the sponsoring organizations of the  
20 study include the following, CEED, which is the Web site we  
21 just discussed, the organization Web site we just discussed,  
22 the Association of American Railroads, the Edison Electric  
23 Institute, the National Mining Association, the National Rural  
24 Electric Cooperative Association, and the National Black  
25 Chamber of Commerce. Is that a correct --

1 A. That's correct.

2 Q. -- list of the sponsors of your study?

3 A. Yes, it is.

4 Q. So are you familiar with your client CEED, the mission  
5 or the description of that organization, that they hold  
6 themselves out as a nonprofit group dedicated to protecting the  
7 viability of coal-based electricity?

8 MR. GLASER: I have to object to the characterization  
9 of CEED as Mr. Klein's client. I don't think there's any  
10 evidence that that's what that is.

11 Q. (BY MS. GOODPASTER) Could you clarify for me what a  
12 sponsor of a study is? Isn't that an entity which either  
13 commissions or compensates you for preparing a study?

14 A. I was commissioned by CEED and the other sponsors you  
15 mentioned there to prepare a study that looked into this. They  
16 stated to me that their belief was that an objective analysis  
17 of this particular issue would be supportive of their opinion.  
18 To do so, I recruited as a co-author one of the country's  
19 leading academics in decision sciences and we also brought on  
20 as peer reviewers two other nationally-recognized people in  
21 this field.

22 Q. When I reviewed the study, page 9 of the study, it  
23 wasn't included as an exhibit to your testimony, but I assume  
24 you are generally familiar with your own study, and an  
25 assumption of the study appears to be, correct me if I'm wrong,

1 that one would replace all coal with a higher cost alternative,  
2 doesn't it?

3 A. The study as a framework tried to examine what would  
4 be the health and mortality impacts of not having coal in our  
5 electric system, and to use that, it used as proxies some of  
6 the other analyses that were prepared in the late nineties and  
7 early 2000s under KYOTO Protocol, initial caps on both, which  
8 looked at substantial reductions in greenhouse gas emissions.  
9 Most of those studies in turn achieved those reductions by  
10 substantial use of other forms of meeting electric needs than  
11 coal, either switches to natural gas, conservation, renewables  
12 and the like. It is also the case that these alternatives in  
13 the modeling had a higher cost than what we have now, which is  
14 what one would expect.

15 Q. And that was the assumption of your study and just --  
16 you said that the assumption is what would happen if all coal  
17 in the electric system were removed, correct? It was replaced  
18 with something else.

19 A. That was one of the steps we did to derive a national  
20 cost by which we could then begin to develop these mortality  
21 factors to find the relationship between electricity cost and  
22 human life.

23 Q. I'm going to try to get the quote from the study here  
24 just to make sure I get it correct here. Would you agree with  
25 me that at page 9 you state that if coal use for power

1 generation could be replaced by lower cost alternatives, that,  
2 would increase income and/or decrease unemployment, then our  
3 methodology would subsequently indicate positive associated  
4 benefits for health and mortality. Does that sound like an  
5 accurate statement from your study?

6 A. Absolutely. It would be I think an improper  
7 characterization to describe my study as saying coal leads to  
8 longer life by virtue of its cost. The correct statement would  
9 be use of lower cost resources leads to longer life and to the  
10 extent those lower cost resources happen to be coal, then you  
11 can make the connection. That statement was put in very  
12 specifically to let one know that if a situation should  
13 reverse, if some miracle technology should occur or if gas  
14 prices should fall to one-tenth of what they are, use of coal  
15 instead of this new lower cost option would have negative  
16 effects, and you should switch to the lower cost resource.

17 Q. I appreciate your clarifying that because when you  
18 read the title of the study, that doesn't come out. The title  
19 of the study is mortality reductions from use of low-cost coal  
20 fuel power, so I wanted to be clear that we are understanding  
21 what your analysis is.

22 A. It wasn't confusing to me and I put the word  
23 "low-cost" before "coal" specifically for that purpose.

24 Q. Okay, thank you. Does the study that we have just  
25 been talking about, did you subtract from any benefits you

1 found, health benefits you found associated with increased use  
2 of coal or even -- let me back up. Your study attempts to  
3 quantify health or mortality benefits associated with low cost  
4 coal as compared with a higher-cost alternative.

5 A. My original 2002 study attempted to quantify that,  
6 yes.

7 Q. Yes. And you didn't subtract from any of those  
8 benefits that you were quantifying the health impact costs from  
9 burning coal such as premature death from respiratory  
10 illnesses, asthma, mercury deposition in fish causing high  
11 mercury blood levels in women of childbearing age, coal mining  
12 deaths, any of those quantifiable measures?

13 MR. GLASER: I object to that question. Counsel, you  
14 are testifying now about issues that you have with the burning  
15 of coal that I don't think this witness has testified to.

16 MR. SMITH: I will agree you did a little bit of  
17 testifying but I think he gets the general point and I'm going  
18 to let him answer in the general sense of did you quantify the  
19 other side of the coin, which are health effects that might be  
20 associated with coal as a resource.

21 A. No, and as I recall in that report, I specified why we  
22 didn't. I'm not an epidemiologist, I can't speak for other  
23 professional studies on this any more than any other  
24 nonqualified person would be. The purpose of this report was  
25 to show that there are tradeoffs. That seesaw cartoon I had on

1 my slide was to indicate that, that there are no simple  
2 slam-dunk easy choices that are universally right. Our good  
3 intentions on the environment often carry a cost and those  
4 costs in turn can have negative effects and that was the  
5 purpose of this report.

6 Q. (BY MS. GOODPASTER) So you don't know how the balance  
7 comes out in the end when you measure, you have both sides of  
8 the seesaw occupied?

9 MR. GLASER: I object. That's an awfully general  
10 question. Are we talking about Big Stone now or are we talking  
11 about nationally, what are we talking about?

12 MS. GOODPASTER: I'm talking about his study.

13 MR. SMITH: Overruled.

14 A. Our purpose in doing that report was to develop the  
15 methodology and document the sources and the methods so that  
16 anyone who wanted to could make that tradeoff.

17 Q. (BY MS. GOODPASTER) Is it your understanding that the  
18 Big Stone co-owners have used your analysis in this proceeding  
19 to add additional analysis that is also part of the tradeoff?

20 A. I'm not sure I understand your question.

21 Q. It appears that your -- what you have stated here is  
22 that you have provided part of what you feel is the appropriate  
23 analysis that should be undertaken and the seesaw cartoon that  
24 you referred to, and so you looked at health impacts, mortality  
25 impacts associated with not burning coal and burning something

1 higher cost instead. And you have also said that you have not  
2 looked at the health impact costs because you are not qualified  
3 to do so, so the health impact costs that I was listing before  
4 about respiratory illnesses and mercury and things. And I'm  
5 wondering if you know whether the Big Stone co-owners have  
6 attempted to quantify those health impacts to use your analysis  
7 in the framework you suggest.

8 A. I don't know what the Big Stone owners have done in  
9 trying to quantify health impacts.

10 Q. I'm going to turn to the study again and I did not  
11 reprint copies of it just because it's lengthy and he did say  
12 where it could be found on the Web. But as I was reading it,  
13 we do share your concern that appears to be expressed that high  
14 electric bills affect, can affect poorer populations. I think  
15 we agree that that is a concern.

16 A. Yes.

17 Q. When I was looking at the study, page 21, there's a  
18 table, table 5, where you are summarizing the results of your  
19 study, the relative cost allocation, the estimated deaths  
20 induced by per \$1 billion in regulatory costs. Do you remember  
21 that table in your study?

22 A. Not precisely.

23 Q. Do you remember a table that shows a total of 147  
24 deaths induced per \$1 billion in regulatory costs?

25 A. Is there on that table the inverse, how many dollars

1 per induced death?

2 MR. GLASER: Would it be helpful to show the  
3 witness --

4 MS. GOODPASTER: I can show it to you, sure. It's the  
5 one where it divides the costs between different demographic  
6 groups, it starts with white males, white females, black males,  
7 black females, other males, other females.

8 A. I'm certain that table is in there, but the details of  
9 it were four years ago. If I could see it, I could speak to  
10 it. I won't peek at your question.

11 Q. (BY MS. GOODPASTER) I have notes jotted on there but  
12 you will hear about what my notes are in a second. Do you  
13 remember that one?

14 A. I am covering up the right-hand column with my thumb,  
15 for the record. Yes, I remember this table.

16 Q. Would it be possible for me -- you can keep it.

17 A. The table she's describing is one of the steps in the  
18 methodology that after looking at the increased cost of not  
19 having coal, after looking at the electricity usage pattern by  
20 income bracket and after looking at mortality statistics by  
21 different gender, race and age groups, the methodology put it  
22 all together into a bottom line. The most useful case is what  
23 we call proportional-to-electricity use, that is, if higher  
24 costs are equally distributed to households --

25 Q. Excuse me, I haven't asked you a question about that



1 table yet.

2 A. I thought you asked me what the table was.

3 Q. I generally wanted to refer you to that table and ask  
4 you a question about it.

5 A. Okay.

6 Q. Is it correct that it contains total numbers for a  
7 number of deaths according to demographic population, white  
8 males, white females, black males, black females?

9 A. Yes, it does.

10 Q. And it was -- this whole line of questioning is  
11 stemming from our shared concern about high electric bills and  
12 the effect that that may have on poorer populations. I was  
13 noticing in this table that more than 50 percent of the deaths  
14 that are forecast are in the white male group and I was  
15 wondering whether you're stating that that is the poorest  
16 demographic population. Is that consistent with being the  
17 poorest demographic group in the U.S.?

18 A. No, not at all. There are more whites than nonwhites  
19 in the United States.

20 Q. Uh-huh.

21 A. So even if vulnerability per person were exactly the  
22 same, you would expect more whites, more deaths out of the  
23 total to be white, simply because of larger numbers.

24 Q. We are talking about white males?

25 A. White males have shorter life spans on average than

1 females. And the demographics also show that there is a  
2 greater sensitivity among white males to lower income than it  
3 is for females.

4 Q. The other thing that I wanted to talk with you about  
5 is your correlation that you draw between poor populations and  
6 high residential electric rates or high electric rates and the  
7 relative health of those populations. If you could just bare  
8 with me for a second, let me get my notes. Would you agree  
9 with me that the states with the highest residential electric  
10 rates according to the Energy Information Administration are  
11 Hawaii, New York, Vermont and Maine?

12 A. That sounds reasonable. I would have thought  
13 California might be in there, but you have probably hit some of  
14 the high states.

15 Q. Would your expectation be that the health profiles for  
16 those states would be below average or -- well, would be above  
17 average because their electricity rates are so high?

18 A. Your question is whether because they're higher  
19 electricity rates in New York, are more people dying than, say,  
20 in a low electricity state?

21 Q. Yeah.

22 A. I think that's cutting across many layers of  
23 assumptions that aren't supportable. You have to look first at  
24 the overall income. New York may have high electricity rates  
25 but they also have a much higher income than, say, Arkansas, so

1 that's going to be a dominant effect. The analyses that are  
2 developed here show the effect of a change in rates. It  
3 doesn't try to show if you have this electricity rate, you are  
4 going to live X number of years. It's going to say if higher  
5 costs reduce remaining household income by a certain amount,  
6 then health and mortality risks go up. So a state may be quite  
7 wealthy and may have very high electricity rates, but that  
8 still puts their household income above a poorer state with low  
9 rates.

10 Q. So the fact that -- Hawaii, New York, Vermont and  
11 Maine have the highest electricity rates but if I represented  
12 to you that they are all below average for years of potential  
13 life lost as quantified by U.S. government CDC reports, that  
14 that doesn't change your analysis that you have provided to us?

15 A. Electricity costs are but one of hundreds of household  
16 costs.

17 Q. And so in --

18 A. So pulling that out in isolation I think renders the  
19 question false.

20 Q. And so the converse also wouldn't change your  
21 perspective of Kentucky, Tennessee, West Virginia having low  
22 electric rates and heavy coal usage in each of those states but  
23 above average years of potential life lost in each of those  
24 states?

25 A. Again, I don't think you can make that extrapolation

1 from this. The proper use of the information I developed in  
2 these reports is to say if there is a change in electricity  
3 costs, that in turn changes household income, what is the  
4 effect of that change. So it's looking at the change from the  
5 status quo, it's not trying to predict what the life expectancy  
6 of the status quo is.

7 Q. And we established early on in this conversation, I  
8 believe, that if an alternative were lower cost than coal, it  
9 would not be your position that coal is reducing -- that the  
10 alternative would be providing greater benefits in scope of  
11 health and mortality.

12 A. The health and mortality benefits accrue to the low  
13 cost resources. To the extent that's not coal, it's something  
14 else. If coal is the lowest cost resource, then that's the  
15 resource to which the benefits accrue.

16 MS. GOODPASTER: Thank you very much.

17 MR. SMITH: Ms. Stueve?

18 MS. STUEVE: I have no questions. Intervenors covered  
19 everything and I appreciate your testimony in coming here  
20 today.

21 MR. SMITH: Staff, do you have any questions?

22 MS. CREMER: Staff has no questions, thank you.

23 MR. SMITH: Redirect, Mr. Glaser? Pardon me, I'm  
24 sorry, I'm sorry. (Laughter) Anyhow, Commissioner Johnson.

25 VICE-CHAIR JOHNSON: I do not. I will accept your

1 apology, though.

2 MR. SMITH: That's my job. Commissioner Hanson?

3 COMMISSIONER HANSON: Neither do I, sir.

4 MR. SMITH: Thank you. Now Mr. Glaser.

5 REDIRECT EXAMINATION

6 BY MR. GLASER:

7 Q. Mr. Klein, at the beginning of the cross-examination,  
8 you, in response to a question from Ms. Goodpaster, you  
9 expressed some uncertainty regarding what the intervenors in  
10 this case were proposing in terms of alternatives to Big Stone  
11 II. Could you just explain how that -- what your uncertainty  
12 is and what role that uncertainty may have played in the  
13 analysis that you provided in your testimony?

14 A. My uncertainty I think started with the reading of  
15 their testimony, which looked at a number of different  
16 alternatives, several pages actually of combinations of wind  
17 and gas. I don't recall seeing any specific proposals that  
18 could have replaced the generation and capacity without some  
19 form of fossil fuels.

20 As to the role it played in my testimony, it did not  
21 in that respect. I looked and said, if you don't have Big  
22 Stone II, what do you have, and in absence of the specific  
23 proposal on that, I said, what sorts of things do happen.  
24 Well, could you go to nuclear? Well, perhaps in the future we  
25 might be moving back toward there but we are not there yet.

1 Large-scale hydro is not a factor. Renewables are intermittent  
2 and can only make a limited contribution toward meeting  
3 capacity needs. And doing nothing means you are buying off the  
4 grid.

5 So you are either going to buy off the grid, which is  
6 mostly gas on the margin or you are going to build your own gas  
7 or gas in combination with something else. But in any event,  
8 it is highly likely that if you don't have coal at Big Stone  
9 II, you are going to be using more gas.

10 Q. Then there was a great deal of discussion about the  
11 study that you did with Mr. Keeney. Was that -- was that study  
12 prepared specifically for this case that we are here at today?

13 A. No, that study began in 2001 and was published in late  
14 2002.

15 Q. And is that study the only basis for the conclusion  
16 that you made regarding the I think what you called the  
17 wealthier is healthier effect?

18 A. Those findings have been around for decades across  
19 countries, across states, across every demographic you can  
20 imagine. Groups like the World Health Organization and World  
21 Resources Institute point to these types of studies, indicating  
22 that the number one killer on the planet is poverty. That is  
23 perhaps less applicable in a prosperous nation like the U.S.  
24 but there are still discernable effects relating mortality and  
25 life expectancy to income.

1 Q. And lastly, there was some discussion regarding the  
2 correlation between electric rates and health effects regarding  
3 higher income states with higher rates, lower income states  
4 with lower rates and how that played into your analysis.  
5 Overall, what would your conclusion be with respect to a state  
6 with below-average income such as South Dakota, which has  
7 relatively low electric rates, what would your conclusion be in  
8 terms of the effect of increasing electric rates in South  
9 Dakota?

10 A. Well, when we look at household income, average  
11 household income across states, we see a span of tens of  
12 thousands of dollars between the poorest states and the  
13 wealthiest states, so changes in electric bills are fairly  
14 modest in terms of the average household income, which is why I  
15 was stating that I didn't think the high state, high rate  
16 comparison was a valid one.

17 Within any individual state at any starting point, I  
18 think it is very much the case that changes in the income on  
19 the margin, either by virtue of higher or lower electric bills  
20 or by any other change in living costs, has an effect and in  
21 lower income states, of which South Dakota unfortunately is  
22 one, these effects are pronounced, for two reasons.  
23 Electricity use in households is not proportional to income.  
24 Lower income households are going to use a higher percentage of  
25 their income on energy, and these are the very same households

1 that are most vulnerable to the health effects of changes in  
2 income.

3 MR. GLASER: Thank you, I have no more questions.

4 MR. SMITH: Thank you. Any follow-up cross to that?

5 MS. GOODPASTER: No.

6 MR. SMITH: Thank you, you are excused. I appreciate  
7 it. We are now going to recess for lunch, if that's okay.

8 VICE-CHAIR JOHNSON: Another reminder to those on the  
9 Internet, our lunch is 75 minutes so that would put us back at  
10 1:25.

11 (Whereupon, the hearing was in recess at 12:08 p.m.,  
12 and subsequently reconvened at 1:30 p.m., and the following  
13 proceedings were had and entered of record:)

14 VICE-CHAIR JOHNSON: Mr. Smith, Commissioner Hanson  
15 will be along in just a few moments but did want us to get  
16 started.

17 MR. SMITH: We shall, then. This is our new system  
18 for making sure we turn on the Internet is to put it under my  
19 mike so I have to. Are we ready?

20 We are back on the record following our noon recess.  
21 We are in the middle of the applicants' direct case.  
22 Commissioner Hanson is going to be a little bit late, he had a  
23 problem and so in the interim while he is -- while we are  
24 waiting for him to arrive, applicants, did you have a couple of  
25 housekeeping measures that you wanted to deal with in the



1 interim?

2 MR. WELK: Yes, Mr. Smith. First of all, I have  
3 talked to counsel during the recess break and during my opening  
4 statement I made a couple of comments about some documents, the  
5 number of documents that were produced by the applicants in  
6 this case and also the number of pages of prefiled testimony  
7 and exhibits, and as we all know what I say in opening  
8 statement is not evidence.

9 So I would ask the counsel for the parties and  
10 Ms. Stueve to stipulate that through the course of the  
11 discovery of this proceeding, the applicants have made  
12 available either through electronic means or in hard copies  
13 over 47,000 pages of documents and there have been filed by the  
14 applicants over 2,000 pages of prefiled testimony and exhibits.  
15 So I would ask for a stipulation on that.

16 MR. O'NEILL: We would so stipulate.

17 MS. STUEVE: Yes.

18 MS. CREMER: I find it hard to believe there's only  
19 that many pages. I think you better count again, but yes, I  
20 would stipulate there's at least that many.

21 MR. WELK: Another matter relates to the exhibits and  
22 I just wanted to have the record clear on this. There were a  
23 number of prefiled testimony exhibits that had sub exhibits  
24 appended to them, for example, John Lee I moved for the  
25 admission of Exhibit 36, which would have been his direct but

1 there were actually sub exhibits 36-A through 36-J -- or excuse  
2 me, 36-L and I am assuming that when the exhibit when it was  
3 received, all of the sub exhibits appended to the prefiled  
4 testimony were also deemed admitted.

5 MR. SMITH: It has been my understanding since the  
6 beginning of this hearing that that is the case. If it's not  
7 the case, I would appreciate it if the parties would make that  
8 known now because then we will handle that, but that's been my  
9 assumption from the outset.

10 MR. WELK: Hearing no objections. The other thing  
11 that's a housekeeping matter, through the course of the  
12 proceeding the applicants' witnesses, I believe all of them  
13 have made PowerPoint presentations to the commissioners and the  
14 parties present, and I know the people on the Internet cannot  
15 see those and so for the benefit of the record in this, we  
16 would like to reserve, beginning at Applicants' Exhibit 92, all  
17 of the PowerPoint presentations that have been made and I would  
18 ask those that have been handed out, if you will keep those and  
19 then we will put those into the record and then tell you what  
20 the numbers are and if you do not have a copy of somebody's  
21 PowerPoint presentation, then we will provide you with a copy.  
22 So we will reserve from 92 until the exclusion of all the  
23 PowerPoint presentations.

24 And I will have that done so we'll have that available  
25 in the morning. So please keep those if you want and then

1 we'll give you the numbers in the morning and then let me know  
2 if you don't have a copy of some particular witness. Some of  
3 them didn't have copies that we handed out and we know that we  
4 didn't did do that, but we will try to make sure that everybody  
5 who is here does have a copy of all the PowerPoint  
6 presentations.

7 That concludes the housekeeping matters.

8 MR. SMITH: Are you going to move the admission of  
9 those in the morning?

10 MR. WELK: Yes, once we get them marked so I can refer  
11 to exhibit numbers I will do that.

12 MR. SMITH: I have a housekeeping matter of my own and  
13 that's an announcement and again it's an announcement that  
14 involves work, so it's bad. But that announcement is that  
15 tomorrow morning unfortunately, we move into 413, which is next  
16 door, because the appropriations committee, which pays our  
17 bills, has requested to use this room and so we will oblige  
18 that request and leave. So we're going to move next door.  
19 It's going to be significantly probably more crowded in there,  
20 but that's the way it is.

21 As fate would have it, we scheduled the public input  
22 session for that day without realizing this was going to be the  
23 case. Actually, I think we did know it but we didn't think  
24 about it. So regrettably, we're going to be in a smaller  
25 quarters than we would like to be. But I just want everybody

1 to know that tonight, we've left all our stuff in here,  
2 beginning at the close of business today, we're all going to  
3 have to either move it next door or move it all the way out and  
4 bring it back in in the morning.

5 I apologize for that. And for the public on the  
6 Internet, the public input portion of the hearing tomorrow is  
7 scheduled at least to be in Room 413 at 7 p.m. in the state  
8 capitol building. If we possibly can and the appropriations  
9 committee adjourns its business, we will attempt to move back  
10 in here, which is a much nicer facility but for now that's  
11 where the proceeding is noticed.

12 MR. WELK: Mr. Smith, one other item on an exhibit.  
13 Mr. Lancaster from GRE, I moved for the admission of his  
14 prefiled direct but not his rebuttal. His rebuttal is Exhibit  
15 39, this is one of the witnesses that was not cross-examined  
16 and so to make the record complete, I would move for the  
17 admission of Exhibit 39, which is the prefiled rebuttal of  
18 Richard R. Lancaster.

19 MR. SMITH: Is there an objection to Mr. Lancaster's  
20 rebuttal coming in?

21 MR. O'NEILL: No.

22 MS. STUEVE: No.

23 MR. SMITH: Exhibit -- Applicants' Exhibit 39 is  
24 received into evidence.

25 EXHIBITS:

1 (Applicants' Exhibit No. 39 received into evidence.)

2 VICE-CHAIR JOHNSON: Mr. Smith, I would just add two  
3 other notes. First off, sometimes I wonder if anybody is ever  
4 listening out there on the Internet and our staff did mention  
5 to us in the last two days we have had more than 50 comments of  
6 phone calls come to the office about the Internet, about us  
7 maybe not turning it on or about technical difficulties, so to  
8 me that's quite a bit of evidence that people are out there  
9 interested in this proceeding and that we are broadcasting out  
10 there on the Internet.

11 And secondly I would just note a note of thanks to the  
12 staff that's been keeping us well watered up here in Room 412.  
13 The commission staff has been doing a good job of that and we  
14 so often forget to thank Tina and Carol and the others for  
15 their help. If you are listening, thank you very much.

16 MR. SMITH: Well, do you want to wait longer for  
17 Commissioner Hanson? Shall we wait a few minutes?

18 VICE-CHAIR JOHNSON: I did what I could with  
19 announcements, Mr. Smith.

20 CHAIRMAN SAHR: I could give a thank you speech.

21 VICE-CHAIR JOHNSON: Gary was very explicit that we  
22 should begin when we are ready.

23 MR. SMITH: Under our statutes, the administrative  
24 procedures act here, commissioner, a majority of the body can  
25 hear the case, in fact I can hear it as a hearing examiner and

1 they are required to fill in the gaps by reading the record and  
2 so I'll note for the record that Commissioner Hanson is not  
3 here at this time and then if one of you would be so kind as to  
4 remind me when he shows up, I want to note that, too, so we  
5 will know the portion he is required to read by law. With  
6 that, applicants why don't you begin with your next witness.

7 MR. GLASER: Thank you. Our next witness is Thomas  
8 Hewson.

9 Thereupon,

10 THOMAS HEWSON,

11 called as a witness, being first duly sworn as hereinafter  
12 certified, testified as follows:

13 DIRECT EXAMINATION

14 BY MR. GLASER:

15 Q. Mr. Hewson, could you state your name for the record  
16 and spell it also, please?

17 A. I'm Thomas A. Hewson, Jr., and Hewson is spelled  
18 H-E-W-S-O-N.

19 Q. And Mr. Hewson, do you have a copy of a document  
20 marked Applicants' Exhibit 30, prefiled rebuttal testimony of  
21 Thomas A. Hewson, Jr., dated June 9th, 2006 in front of you?

22 A. I do.

23 Q. And do you also have a copy of a document marked  
24 Applicants' Exhibit 52, prefiled rebuttal testimony of Thomas  
25 A. Hewson, Jr., dated June 16th, 2006?

1 A. I do.

2 Q. And were these documents prepared by you or under your  
3 supervision?

4 A. They were.

5 Q. And if I asked you the questions that are set forth in  
6 these document today now that you are under oath, would you  
7 give me the same answers?

8 A. I would with two corrections.

9 Q. Yeah, that was my next question. Do you have  
10 corrections to make to the documents?

11 A. I do. They are both on Exhibit 30 on page 17. On  
12 line 11 of page 17, it says, similarly, the orange squares that  
13 might also support the Synapse high case are based upon the  
14 Jeffers bill, a bill that was not even reported out of  
15 committee. In looking at the document and looking at my  
16 screen, I couldn't really tell the colors very well, but in  
17 looking at the Synapse report, those dealing with the Jeffers  
18 bill are tan, not orange. So I would say the tan squares as  
19 opposed to the orange squares.

20 In the footnote on footnote number 8, which is on the  
21 bottom of the page, I talk about the bill that Senators McCain  
22 and Lieberman introduced in 2005. One is that senators -- it's  
23 McCain with C as opposed to a D, which is a typo. The second  
24 is in the last line where it says in 2005 they introduced S-826  
25 which provides the same emission reductions as SA-2028. I have

1 come to understand it's Senate Amendment, so it would be  
2 SA-826. Originally S-1131 -- 1151, excuse me. So if you just  
3 inject an A, it would be Senate Amendment 826.

4 MR. SMITH: I note for the record Commissioner Hanson  
5 has rejoined the hearing.

6 Q. (BY MR. GLASER) Mr. Hewson, do you have a -- at this  
7 point I should offer Exhibits 30 and 52 into evidence.

8 MR. O'NEILL: No objection.

9 MR. SMITH: Ms. Stueve?

10 MS. STUEVE: No objection.

11 MR. SMITH: Hearing no objection from staff, Exhibits  
12 30 and 52 are received in evidence.

13 EXHIBITS:

14 (Applicants' Exhibit Nos. 30 and 52 received into  
15 evidence.)

16 Q. (BY MR. GLASER) And Mr. Hewson, you have a summary of  
17 your testimony prepared?

18 A. Yes, I do.

19 Q. And I just wanted to note for the record that -- have  
20 we passed this out?

21 MR. SASSEVILLE: Yes, we have.

22 Q. (BY MR. GLASER) The summary as it is on the screen  
23 now where it says summary, Applicants' Exhibit 30 and 52,  
24 that's correct. I think that we made a typographical error on  
25 the document that was handed out, some of same say Applicants'



1 Exhibit 22 in the printed version. I think we've tried to  
2 correct that to indicate that it's Applicants' Exhibit 30 and  
3 52 instead of 22.

4 With that, Mr. Hewson, I would ask that you give a  
5 summary of your testimony and starting with a statement of some  
6 of your background and qualifications.

7 A. My name is Thomas A. Hewson, Jr. I'm a principal at  
8 Energy Ventures Analysis, which is located in Arlington,  
9 Virginia. In 1976, over 30 years ago, I graduated from  
10 Princeton University with a degree in civil engineering. Since  
11 then I have been involved in energy environmental consulting,  
12 first as a project manager at Energy Environmental Analysis  
13 from 1976 to 1981, and since 1981 I was one of the people who  
14 helped cofound Energy Ventures Analysis. At Energy Ventures  
15 Analysis, I direct the environmental studies, I'm responsible  
16 for the firm's emissions forecasts and industrial compliance  
17 studies. I also do a lot of integrated modeling of the  
18 electric utility industry.

19 As far as this particular project and what I was asked  
20 to do, my scope of work is focused in three areas. One was I  
21 was asked to evaluate the testimony of Mr. Schlissel and Ms.  
22 Sommer regarding the carbon regulation risk. Second, I was  
23 asked to evaluate the use of monetary externalities offered by  
24 Dr. Denney. Then finally, I was asked to evaluate the  
25 Schlissel and Sommer conclusion that whether it was reasonable

1 to assume that a wind production tax credit would be extended  
2 before it expires at the end of 2007.

3 As far as a summary of what I found. First as far as  
4 carbon regulation risk, carbon compliance costs are highly  
5 dependent upon what type of legislation may be adopted, its  
6 severity in terms of the emissions reductions it tries to  
7 achieve, the timing of carbon regulation and the framework in  
8 terms of how it goes about achieving those reductions.

9 In testimony by Schlissel and Sommer, they suggest  
10 that projecting carbon risk is very significant and should be  
11 valued at long-term levelized cost, a midpoint of \$19.10 per  
12 ton of CO2 with a range from a low off \$7.80 to a high of  
13 \$30.50.

14 In my evaluation, I believe that it's likely that  
15 these carbon compliance costs for planning should be -- or are  
16 likely far less than these values and in my opinion, I believe  
17 it should be set at less than \$7 a ton of CO2. There's a few  
18 reasons for that, one of which is when we look at Minnesota  
19 where they do have a CO2 value for carbon dioxide risk, they  
20 use a planning risk of now 35 cents to \$3.64 for in-state  
21 plants. It has no value for out of state plants and so when  
22 the applicant did their application, from what I understand,  
23 they used zero dollars as required in the Minnesota  
24 methodology, but they also looked at a range of 35 cents to  
25 \$3.64 to determine whether or not, given that range, it would

1 lead to a different outcome.

2           The second is looking at -- we are looking at federal  
3 legislation. The state legislature here in South Dakota has  
4 been pretty explicit in terms of what they believe about carbon  
5 dioxide and have passed resolutions that say that they do not  
6 want to have mandated CO2 emission reductions. Taking them at  
7 their word, it would mean that likely if we do have carbon  
8 dioxide regulation here in South Dakota, it's likely to come  
9 from federal legislation and not state legislation.

10           Trying to look at the way the debate has gone, there  
11 is a debate concerning what is the concerns about the cost to  
12 the U.S. economy, and those have been voiced most recently in  
13 the Senate resolutions. When we look at what state region has  
14 done as sort of an indicator of what might occur, there is a  
15 group called the Regional Greenhouse Gas Initiative, which is  
16 a group of states primarily in the Northeast. They adopted a  
17 CO2 regulation, as part of that CO2 regulation, they came up  
18 and did their own analyses that estimated a cost of about one  
19 to three dollars per ton as being their estimate in terms of  
20 compliance cost. So evidently in terms of what they believe  
21 and when they adopted the proposed rule that is still yet to be  
22 adopted by each of the individual states, they are looking at  
23 the one- to three-dollar-a-ton range.

24           Finally in terms of what's happening in the  
25 congressional arena, in my testimony I talk about several

1 bills, but probably the most significant one that I've seen was  
2 an effort by Bingaman last year in which they tried to build  
3 upon a group called National Center for Energy Policy that was  
4 a bipartisan group that was trying to find a mid ground in  
5 terms of what could likely be adopted.

6 This Bingaman bill followed those recommendations and  
7 tried to address the issue of U.S. economy impact by setting a  
8 cap onto carbon dioxide prices and safety valve prices. These  
9 safety valve prices are set in year 2010 at \$6.36 and escalate  
10 over time.

11 And so when we look at what Minnesota has done in  
12 terms of how they handle carbon dioxide risk in their  
13 externality approach, the way RGGI has handled it in terms of  
14 the Northeast adopting a cap and trade program and what Senator  
15 Bingaman has done in the Senate, I think we find that there's  
16 more reasons to believe that a reasonable judgment for planning  
17 would be at a value less than \$7 a ton of CO2.

18 Outside the carbon dioxide risk, I was asked to  
19 evaluate the environmental externalities. Dr. Denney has  
20 suggested monetary environmental externalities should be  
21 applied to quantify an environmental impact. Currently most  
22 states that I'm aware of do not use monetary environmental  
23 externalities in their resource decisions and I am aware that  
24 your friends to the north in North Dakota have actually passed  
25 legislation that prohibits the use of environmental

1 externalities in their decisions.

2 I leave it to the commission to decide, interpret the  
3 rules of what are calculated impacts and whether a monetary  
4 environmental externality is the way to do it or some other  
5 method. However, it would be somewhat unusual I think to apply  
6 an environmental externality without going through a  
7 rule-making process. Environmental externality damage  
8 calculations are indeed controversial and site specific and it  
9 is my opinion that most would likely not apply to South Dakota  
10 given your environment, given you're in compliance with ambient  
11 air quality standards. A lot of issues that may be present in  
12 other states may not be present here in South Dakota.

13 The final issue was about the production tax credit,  
14 which is a very important element when you look at wind  
15 resource costs. Schlissel and Sommer in their testimony have  
16 said that it's reasonable to assume that this tax credit gets  
17 extended before it expires in 2007. Unfortunately, when we  
18 look at the production tax credit history, which has been  
19 extended four times, three times after it expired, I don't hold  
20 out much hope that that will be necessarily the case. In fact  
21 it may be more prudent to assume that it will -- that it will  
22 likely be expired before it gets extended.

23 The longer-range question is will Congress see the  
24 need to continue. One of the reasons of course that a  
25 production tax credit was adopted by Congress was to promote

1 wind production. American Wind Energy Association has  
2 suggested that wind has become cost competitive with other  
3 conventional sources of power. Then second is we also have  
4 some of the question is does it need to be -- what sort of  
5 values are needed in order to promote its use, if it's a  
6 competitive option.

7           Second, is a lot of states, indeed currently 23 states  
8 in the nation have adopted renewable portfolio standards.  
9 Those renewable portfolio standards have set aside a portion of  
10 their market that must be met by qualifying renewable  
11 resources, of which wind is one, and overall now we have about  
12 250 terawatt hours, which is as you are generally familiar is  
13 250 million megawatt hours that has been set aside by these  
14 states for renewable energy.

15           So the question is, in terms of promoting, do we need  
16 to promote beyond that level? Then finally, obviously the  
17 production tax credit is being financed coming out of tax  
18 revenues and the question is, as wind grows and becomes a more  
19 popular resource, whether these dollars are going to come so  
20 great that eventually it will be too much in terms of from a  
21 budgetary impact.

22           So overall, I think eventually it may be extended, but  
23 I do not believe that it will necessarily be extended for the  
24 long term and so when we look at wind in terms of future  
25 resources, it will probably be more prudent to assume that it's

1 more likely, in my opinion, to be not necessarily a long-range  
2 production tax credit availability for, you know, plants that  
3 come on line in the range of the 2011 time frame. I think that  
4 sort of summarizes my testimony.

5 MR. GLASER: The witness is available for  
6 cross-examination.

7 MR. SMITH: Please proceed.

8 CROSS-EXAMINATION

9 BY MR. O'NEILL:

10 Q. Thank you, Mr. Smith. Good afternoon, Mr. Hewson.

11 A. Good afternoon.

12 Q. Mr. Hewson, can you tell us your definition of the  
13 term "externality"?

14 A. Environmental -- as in an environmental externality?

15 Q. Yes.

16 A. Environmental externalities are normally defined as a  
17 damage or a cost that is not captured in the production cost.

18 Q. Thank you. On page 6 of your testimony, Applicants'  
19 Exhibit No. 30, if you can go to that page and focus on lines 9  
20 through 12. Are you there?

21 A. I just wanted to read it.

22 Q. Sure, go ahead. I was going to tell you to do that.

23 A. Thanks. Yes.

24 Q. To paraphrase, it appears here you are critical of  
25 Mr. Schlissel and Ms. Sommer 's criticism of the Minnesota

1 commission's externality value that they attribute to CO2; is  
2 that true?

3 A. I believe the way to phrase it is that I was critical  
4 that they didn't recognize the value in that in Minnesota if  
5 you were to put a resource, that is the value that one  
6 attributes to carbon risk that has been approved by the Public  
7 Utility Commission.

8 Q. Now, in your work, you do forecasting for other  
9 environmental emissions besides CO2; is that true?

10 A. That's correct.

11 Q. And one of those would be SO2; is that true?

12 A. Indeed.

13 Q. And NOX; is that also true?

14 A. Yes.

15 Q. And were you to do forecasting for clients today,  
16 would you use the 1997 numbers for your forecasting of 2006 and  
17 forward legislation?

18 A. In the case of making a resource decision, I would try  
19 to apply the rules that are in place first.

20 Q. And if the rules that are in place have 1997 values  
21 associated with them, would you try and look at something more  
22 current to try and estimate what future legislation would be on  
23 an environmental emission?

24 A. Well, if I was in Minnesota, I would say that the  
25 Public Utility Commission was fairly explicit in terms of what



1 they asked applicants to do in making their resource decisions.  
2 In fact I believe in looking at the decision, that they looked  
3 at five different approaches that could be adopted in trying to  
4 look at carbon risk and what they adopted was the damage  
5 approach.

6 Q. And it was a 1997 order; is that true?

7 A. That's correct.

8 Q. And it was an externality value that they ascribed to  
9 it as opposed to one that can be internalized in the  
10 production; is that true?

11 A. Yes, they assigned a value of range values that is  
12 supposed to be escalated which is now escalated to 35 cents to  
13 3.64 per ton.

14 Q. On page 14 of your testimony, you do acknowledge, and  
15 I'm focusing on page 14, lines six through eight, that CO2  
16 regulation is a material risk that should be quantified; is  
17 that true?

18 A. I believe that CO2 is a material risk.

19 Q. Moving on, are SO2 and NOX costs static?

20 A. In terms of when you say static, are you saying the  
21 market value for SO2 and NOX?

22 Q. Yes.

23 A. No, they fluctuate. There is a market just like the  
24 stock market goes up, down.

25 Q. In your testimony, you state that the Minnesota

1 externality value should be used rather than the California CO2  
2 adder. What is the basis of your testimony in that regard, Mr.  
3 Hewson?

4 A. Could you direct me to where I say that they need  
5 to -- they should apply it?

6 Q. I wish I could, but my ghost writer did not for me.  
7 Do you remember testifying in that regard?

8 A. I believe that the testimony that you refer to deals  
9 with my discussion about Dr. Denney, which she was trying to  
10 look at damage or environmental externality values and I was  
11 suggesting that the California approach was not a damage  
12 approach.

13 Q. Why is that, is that because the damage approach is  
14 not measuring regulatory risk?

15 A. It was simply that if Dr. Denney was trying to do  
16 environmental externalities and do environmental damage, that  
17 to apply a value in California that was not based upon  
18 environmental damage did not achieve her objective.

19 Q. Okay. Would you recommend \$7 as a planning number, \$7  
20 a ton for CO2 regulatory cost as a planning number going  
21 forward?

22 A. I think my conclusion was less than \$7.

23 Q. And what number would you recommend going forward and  
24 over what time period?

25 A. I believe that -- of course my rebuttal testimony

1 dealt with trying to look at \$19.10 per ton and trying to look  
2 at whether that was a reasonable number or not. If you are  
3 asking me for my opinion and what if Otter Tail was a client of  
4 mine, what I would use, is that the question?

5 Q. It is.

6 A. Right now in terms of our projections, we use \$6 a ton  
7 beginning in year 2013 in constant 2006 dollars, as will be  
8 coming out in the next few weeks. Last year we were at \$5.50.

9 MR. O'NEILL: That's all the questions I have.

10 MR. SMITH: Thank you. Ms. Stueve, do you have  
11 questions?

12 MS. STUEVE: I have no questions.

13 MR. SMITH: Ms. Cremer. Staff, do you have questions?

14 CROSS-EXAMINATION

15 BY MS. CREMER:

16 Q. Good afternoon. Could you look at Exhibit 30, page  
17 34? Then I'll just have you quickly read lines like 20 through  
18 24 so when I ask you the question.

19 A. Line 20 to 24?

20 Q. Right.

21 A. Let me get my context here.

22 Q. I can relate.

23 A. Starting on line 20 to 24 --

24 Q. I can just ask the question. Okay?

25 A. Okay.

1 Q. I wanted you to read it. Basically aren't you saying  
2 that Big Stone II will have emission controls that will remove  
3 oxidized mercury from the coal?

4 A. The wet FTD will remove the oxidized mercury portion,  
5 yes.

6 Q. And then you also say that oxidized mercury is the  
7 type of mercury that deposits locally.

8 A. That's what we have been finding, yes.

9 Q. Then you go on to conclude that the -- that the only  
10 Big Stone II's mercury emissions will consist of elemental  
11 mercury that does not deposit locally.

12 A. That's correct.

13 Q. So then I have two questions about that. Are you  
14 saying that all of the oxidized mercury will be removed at Big  
15 Stone II?

16 A. In the tests that have been done by EPA as far as  
17 where we have been doing a lot of testing to try to figure this  
18 out, we have been finding that almost all the oxidized mercury  
19 is removed in a wet FGD scrubber.

20 Q. So almost all?

21 A. Right, I mean obviously we are dealing with  
22 concentrations so small that we are probably under the ability  
23 to detect.

24 Q. And so -- have you discussed that with the Big Stone  
25 II application or like Mr. Graumann?

1 A. No.

2 Q. Do you know what the relative portions of --  
3 proportions of oxidized and elemental mercury in the coal used  
4 at Big Stone II are?

5 A. This would be a subbituminous coal.

6 Q. Yes.

7 A. First of all, the amount that goes up the stack is  
8 highly dependent in the chemistry of the plant and has a lot to  
9 do with the coal, whether they do additives, whether they do  
10 blending, and so it's hard to overgeneralize. But if I had to  
11 say a general rule of thumb, that roughly three-quarters of  
12 subbituminous coals, when burned before it gets into the  
13 control equipment, would come up -- we have been finding is  
14 more elemental mercury and 25 percent is oxidized or  
15 thereabouts. It's going from memory, I'm sure I could get a  
16 lot more significant digits if that's important. They do vary  
17 based upon the individual projects where we have done testing.

18 MS. CREMER: That's all I have, thank you.

19 MR. SMITH: Commissioner questions.

20 COMMISSIONER HANSON: Not from me.

21 EXAMINATION

22 BY CHAIRMAN SAHR:

23 Q. I do have one and I wanted to make sure I understood.  
24 Staff had asked you a question about the mercury and you stated  
25 that based on testing or some type of experience, that the

1 oxidized mercury removed by the wet scrubbers would be to the  
2 point of almost being not able to -- such a small quantity as  
3 to be difficult to measure; is that correct?

4 A. That's what we have been finding.

5 Q. Just to make sure I completely understand this, is  
6 there any other mercury that is leaving the plant otherwise  
7 because of the process of burning coal or any of these other  
8 processes? Am I missing something or is that the total answer  
9 to the question?

10 A. Normally when we talk about mercury and mercury  
11 emissions, we track three different types of mercury that are  
12 produced from the burning of coal. There's particulate  
13 mercury, that that's associated often with ash, which is often  
14 removed by your particulate control equipment. If your  
15 particulate control equipment is 99.9 percent, generally we are  
16 removing most all, practically all the particulate mercury. We  
17 also have oxidized mercury, which is mostly has been oxidized  
18 in something like a mercuric chloride. These tend to be water  
19 soluble forms of mercury and that's why when we put a wet FGD,  
20 since they are water soluble, they get caught in the scrubber  
21 and they are removed.

22 Elemental mercury is fairly stable and it goes up the  
23 stack and is not necessarily removed by particulate control  
24 equipment. There's some that is removed because as it cools  
25 down, it can absorb on particulate equipment. Particulate, the

1 ash. But generally speaking, that's the mercury that's being  
2 primarily emitted from plants that are scrubbed with advanced  
3 particulate control equipment such as being proposed here at  
4 Big Stone. It would be in that form.

5 Q. So the first two categories are primarily being taken  
6 care of through, whether it's particulate control or else  
7 scrubbing.

8 A. Scrubber.

9 CHAIRMAN SAHR: I may have a follow-up question, but I  
10 need to reflect on that for a minute. Thanks.

11 EXAMINATION

12 BY VICE-CHAIR JOHNSON:

13 Q. Mr. Hewson, you noted that if you had a client that  
14 asked you what you would estimate regulatory control costs for  
15 carbon, what that should be, I think you said \$6 per ton  
16 beginning in 2013; is that right?

17 A. That's what we do for our forecasts, yes.

18 Q. You said last year you were forecasting \$5.50 per ton  
19 beginning in 2013; is that right?

20 A. That's correct.

21 Q. Anything in particular cause a revision in the  
22 estimates, the forecast you are providing to your clients?

23 A. Maybe just to be an even number. It's always fun, you  
24 can imagine my partners and I always get together and we talk  
25 about what the future is and what the values are going to be.

1 It's always a fun, lively debate. But yes, we figured this  
2 year \$6 would probably be closer to what we would use or what  
3 we are using.

4 VICE-CHAIR JOHNSON: Thank you, and I do appreciate  
5 the difficulties in seeing into the future. I can't decide  
6 whether my son will be an all star basketball or football  
7 player by 2013. Thanks.

8 EXAMINATION

9 BY CHAIRMAN SAHR:

10 Q. Back to the question about mercury, with the elemental  
11 mercury, so talk a little bit more about that. What happens  
12 with elemental mercury? What are the side effects, problems,  
13 so on and so forth? What should we as commissioners be  
14 concerned or not be concerned about that?

15 A. Elemental mercury when it goes up the stack comes up  
16 as part of the mercury reservoir that we have. It can go long  
17 distances, stay up there for years, until it gets -- somehow it  
18 needs to be converted eventually into a form that will either  
19 be absorbed onto water particles and come down in the rain or  
20 get something like ozone to make it into an oxidized form, make  
21 it heavier and drop. So generally speaking, as far as -- you  
22 were asking about the health effects; is that correct?

23 Q. Yes.

24 A. First of all, I'd like to say that I'm not a health  
25 expert. But I do know the following, is that mercury when it



1 comes down has to -- the forms that we are concerned about in  
2 the public health sector has more to do with methyl mercury, so  
3 the mercury that comes down is not the form that we are  
4 concerned about. It has to get converted from mercury into  
5 methyl mercury and so it gets a lot into lake chemistry and I  
6 am also not a lake chemistry -- or chemist. However, you do  
7 need some anaerobic activity in order to change the mercury  
8 into methyl mercury. Then you have to have methyl mercury  
9 absorbed by a fish and then those fish have to -- generally  
10 speaking, big fish eat little fish and it gets accumulated in  
11 the fish tissue. So the concerns that we have in terms of you  
12 look at EPA and what they are regulating is the concern is  
13 dealing with primarily mercury exposure from eating fish and  
14 the concerns about how those concentrations change with time.

15 Q. When evaluating the -- I am going to use some probably  
16 ridiculously off base lay terms, but basically when this  
17 elemental mercury goes up, goes up in the atmosphere, what's  
18 the drop zone, what's the footprint? Are we talking does this  
19 travel hundreds of miles, tens of miles, does it go with the  
20 prevailing winds, so on and so forth?

21 A. Its goes with the prevailing wind, it can be up there  
22 for years, and so one of the challenges in terms of mercury  
23 deposition modeling is, as you can imagine, something that  
24 stays up there for a long period of time is we are less than  
25 accurate in terms of being able to figure out or do source

1 attribution associated with the mercury that comes down.  
2 However, we feel fairly confident in terms of what's coming  
3 down here in South Dakota didn't start here in South Dakota.  
4 It could be from China, it could be from that reservoir.  
5 There's obviously -- as you might remember, mercury is a  
6 natural occurring element and so when we have volcanoes and all  
7 that, that also emits large amounts of mercury, so a lot of  
8 mercury is also naturally occurring.

9 Q. That was going to be my next question. What are the  
10 likely sources of elemental mercury? And maybe you just  
11 answered that.

12 A. Well, in the earth's crust we have mercury and so it  
13 is a natural occurring element and so whenever -- it can be  
14 released in an event, normally like heating things up, it can  
15 be volatilized, we can release it there. So there are lots  
16 of -- then when it comes down, it can also then immediately get  
17 evaporated up and so it can come down, up and never turn into  
18 methyl mercury immediately either. We do have sources in terms  
19 of that we contribute. Keep in mind these fluorescent bulbs  
20 have mercury in them in terms of mercury switches. We use  
21 mercury in terms of our dental fillings. We use it in  
22 thermometers. Those little switches we used to see in those  
23 sneakers if you are an all star used to be mercury switches.  
24 We use mercury for a lot of different industrial uses and so  
25 sometimes when we then dispose of that, that also gets into the

1 environment and sometimes gets released.

2 Q. And you somewhat touched on this, if we are looking at  
3 the Upper Midwest and we are looking at the sources of  
4 elemental mercury that come down from the atmosphere, can you  
5 peg or is that 90 percent from coal plants, five percent from  
6 volcanoes, any idea of how these things break out or any  
7 estimates on that?

8 A. Let me make a suggestion. I know of a report that was  
9 done by EPA that attempted to do what you are asking. I was  
10 not the author of it, I was not a producer of it, but it was  
11 based upon modeling that was being done in trying to answer  
12 your very question. I would be surprised, given that the U.S.,  
13 say U.S. coal-fired power plants were emitting roughly around  
14 45 tons, we have -- our national or international reservoir of  
15 that is far, far, far greater and that 45 tons represents an  
16 extremely small percentage of the total. It would be probably  
17 hard to say that that coal plant, you know, where it ended up.  
18 But I will offer and I would be more than glad to supply the  
19 report that did do attributes and I would believe that it will  
20 show that as far as here in South Dakota, there is -- it will  
21 be a monitoring point and then that monitoring point, based  
22 upon their models, which are not always perfect, they could  
23 give you an idea of how much comes from China, how much comes  
24 from Europe, how much comes from the U.S. and whether it's coal  
25 or not. Those are types of things that the model output is.

1 Q. And I think I know the answer to this, but is there  
2 any cost effective way to deal with the -- or to reduce or  
3 limit or eliminate the elemental mercury that is emitted by a  
4 coal-fired plant?

5 A. Currently obviously we have a lot of very promising  
6 things in terms of research. We are spending a lot of research  
7 money in order to figure out how to do it better. Some of the  
8 areas that we have been working on is activated carbon  
9 injection in terms of injecting carbon in order to absorb the  
10 mercury, elemental mercury, and we are finding that we can  
11 remove amounts there. We also are doing coal blending in terms  
12 of trying to take western bituminous coals and the Powder River  
13 Basin subbituminous coals. What happens is the reason why you  
14 have -- our theory currently is that the reason why you have so  
15 much elemental mercury with subbituminous coals is we don't  
16 have a lot of halides in the coal, in the subbituminous coals  
17 to interact with mercury and make it oxidized mercury that can  
18 be removed.

19 What we have been doing is we have been blending  
20 bituminous coals that have high halide contents with those that  
21 don't and what we are finding is when we do that, we actually  
22 are producing more oxidized mercury forms that can be removed  
23 and so we have some very promising results in that as well. We  
24 are trying to do the same thing with perhaps without having to  
25 use bituminous coals in terms of doing additives. It's been

1 mixed. We have also been trying methods in order to cool down  
2 the flue gas stream because, as you can imagine, if we get it  
3 down cool enough, the mercury will absorb onto the  
4 particulates, the ash. We haven't had a lot of success that  
5 way as yet. But we are probably pursuing, that I am familiar  
6 with, maybe three or four different approaches in order to  
7 address the elemental mercury issue in particular and there's  
8 some very promising research and initial demonstration results  
9 where we have been getting a large portion of it.

10 Q. Would this type of technology, and this may be getting  
11 pretty far out there hypothetically, but would this be the type  
12 of technology that you believe could possibly be used to  
13 retrofit plants that are already existing or will be built in  
14 the next decade?

15 A. Obviously when we look at the Clean Air Mercury Rule,  
16 which we call CAMR, which is the federal rule that deals with  
17 mercury emissions, the belief was that in 2018 we would have  
18 technologies that could easily be retrofitted that would be  
19 cost effective and demonstrated at the time in order to reduce  
20 the mercury. Most of those, the optimism now focuses around  
21 the activated carbon injection systems, where we can inject  
22 activated carbon, in fact that's where we are doing it in terms  
23 of existing power plants and retro -- putting in carbon  
24 injection systems into existing coal-fired boilers and if we do  
25 it where they have a lot of ESP, surplus ESP capability, they

1 have been able to do it without doing upgrades in their  
2 particulate control equipment.

3 We have also been trying to do it in terms of  
4 injecting it after the flue gas because one of the issues with  
5 activated carbon injection, when we get carbon in the ash, it  
6 makes it less salable and we do sell a lot of our ash in the  
7 U.S. for roadbed material and cement. And if we have too much  
8 activated carbon, we are no longer able to meet the  
9 specifications. So what we are trying is we are also doing an  
10 attempt at later in ESP or as a separate add on, putting in  
11 carbon injection after the particulate control equipment and  
12 then putting specific polishing filters for activated carbon.  
13 And that's called Toxicon (sp) is the scheme and Copak (sp) is  
14 another name and those seem to be some that we are spending  
15 money in looking at.

16 Q. So it sounds like there's a lot of interest in looking  
17 at possibly situations when the technology becomes more proven  
18 and more cost effective at looking at retrofitting coal plants.

19 A. Oh, yes, there's -- we are pursuing all sorts of  
20 wonderful ideas and may most of them turn out to be good.

21 Q. Will this facility have an ESP?

22 A. I would have to defer to the applicants. I do not  
23 remember off the top of my head.

24 Q. And then -- I'm sorry. Mr. Glaser.

25 MR. GLASER: Would it be helpful --

1           A.    We could probably have someone in the room that can  
2 answer that.

3           MR. GUERRERO:  Introduce yourself and pull up a chair.

4           MR. ROLFES:  I'm Mark Rolfes, the project manager.

5           MR. SMITH:  You are still under oath.

6           MR. ROLFES:  This unit will have a fabric filter, will  
7 not have an ESP.

8           CHAIRMAN SAHR:  Thank you.

9           Q.    (BY CHAIRMAN SAHR)  And I appreciate you indulging my  
10 questions here.  Back to kind of a very lay question.  I think  
11 a lot of the members of the public probably have heard  
12 discussions that you have the acid rain, you have the fish in  
13 the lake getting high levels of mercury and possible health  
14 concerns to humans and other animals who might end up eating  
15 those fish, and excuse me if I'm explaining that way too  
16 simply, but what do you think about those concerns and -- let  
17 me ask it that way.  What do you think about those sort of  
18 concerns?

19          A.    I think it was because of those concerns we ended up  
20 with the Clean Air Mercury Rule and that is an attempt to start  
21 to address those concerns.

22          Q.    If we are looking at that average fish out there in  
23 the average lake somewhere in the United States, is the link  
24 pretty definite that that is because of acid rain?  I know  
25 there's naturally occurring mercury and so on and so forth.

1 How strong is the link between coal-fired plants and increased  
2 mercury levels in fish?

3 A. Let me answer your question --

4 Q. Please feel free to take the liberty to rephrase and  
5 restructure the question.

6 A. First of all, as far as mercury is concerned, our  
7 first step was to pick on the big guys. The largest single  
8 source of mercury was not the coal-fired plants, it was  
9 incinerators and so the first thing we did was we went after  
10 them. Second thing we did was we went after number two on the  
11 list, which was the medical incinerators and we went after  
12 them. And EPA has adopted very strict rules in trying to  
13 reduce emissions of mercury from those sources. Those sources  
14 are a lot easier to reduce because the concentrations of  
15 mercury in the flue gases are much, much higher from what you  
16 have in burning something which is truly in parts per billion  
17 range in the coal and trace elements and trying to reduce  
18 something in a coal-fired plant.

19 However, coal plants were the number three on the list  
20 and so I think what EPA has done is after they went after  
21 number one and number two, they went after number three and  
22 that's what we see happening today in the Clean Air Mercury  
23 Rule. The hope is obviously in doing a two phase approach, is  
24 we are also doing a lot of scrubbers, FGD scrubbers in terms of  
25 what we are trying to achieve for fine particulates in



1 particular, and that -- because we are putting on scrubbers, we  
2 are going to get a lot of mercury reductions and that will give  
3 us time in order to develop these technologies that we are all  
4 working fast and furiously on and everyone has a -- has the  
5 next greatest idea, that that will give us an opportunity in  
6 order to develop them to a point where they are going to be a  
7 lot -- we hope to be a lot cheaper, a lot higher performing  
8 than what we see today.

9 CHAIRMAN SAHR: Thank you.

10 EXAMINATION

11 BY COMMISSIONER HANSON:

12 Q. Previous questions and your answers prompted just some  
13 questions by me, if I may. When you were talking about the  
14 different industrial uses of mercury, certainly mercury is used  
15 in a lot of daily operations such as even with immunizations.  
16 However, that's not to imply that mercury -- even though  
17 mercury is very useful, it's still a very serious element that  
18 has to be measured extremely carefully when dealing with  
19 citizens' health. I don't want to editorialize, but I'm sure  
20 you didn't mean to infer that when you were --

21 A. No, definitely we try to be very careful with uses of  
22 mercury or the industry -- I shouldn't say we -- the industry  
23 is often very careful. Obviously it does, as you mention, have  
24 lots of uses, even in agricultural use in terms of as a  
25 fungicide.

1 Q. Are those different types of mercuries that are used  
2 in those areas?

3 A. Different types of mercury?

4 Q. When you talk about the mercury in its different  
5 forms, it's used in different forms as it is applied.

6 A. Mercury, as far as the element, does end up in various  
7 different types of compounds that are used in various  
8 applications, as well as the elemental mercury form.

9 Q. In South Dakota we have lakes and streams that have  
10 degradation from mercury and there are warnings for eating fish  
11 in five different counties presently. I think my main concern  
12 with Big Stone II is whether or not the project will in fact  
13 increase or potentially increase degradation of our streams and  
14 waterways and perhaps have adverse health effects from that  
15 standpoint. Testifying within your capabilities, is it your  
16 belief that this project that is proposed as it is proposed  
17 would create greater degradation to the citizens?

18 A. Based upon what we know about mercury, I would say no,  
19 that what will happen is that we are going to be removing or  
20 the applicant would remove almost all the particulate and  
21 oxidized portions of the mercury that would be the type that  
22 would not transport as well and would be left with primary  
23 elemental mercury, what does get emitted from the plant, which  
24 will transport long distances. So I think in terms of when you  
25 talk about South Dakota lakes and degradation, I would say that

1 based upon what I know of the science today, that it's  
2 unlikely.

3 Q. I appreciate your answer and appreciate knowing that.  
4 Knowing -- again, if this is outside your scope, just for my  
5 own curiosity, knowing the tremendous number of coal plants  
6 that are being built in China, and you happened to mention  
7 that, are we at more risk from the coal plants being built in  
8 China than we are from coal plants being built in South Dakota?

9 A. I would say based upon the EPA modeling results,  
10 that's probably what I would conclude.

11 COMMISSIONER HANSON: Thank you.

12 MR. SMITH: After that, and I'll ask your opinion on  
13 this, Mr. Glaser, it occurs to me that perhaps we ought to give  
14 the cross-examiners a shot at resuming so that when you go back  
15 to redirect, we are not out of whack. Is that okay?

16 MR. GLASER: That's fine with us.

17 MR. SMITH: That way you will be better able to  
18 foreclose out of sequence questioning.

19 MR. GLASER: That's fine.

20 CHAIRMAN SAHR: I have a comment and another question.

21 EXAMINATION

22 BY CHAIRMAN SAHR:

23 Q. General counsel was nice enough to point out I may  
24 have made a reference to acid rain, which would be SO2 and NOX  
25 derived, not dealing with mercury. So I appreciate him

1 clarifying that for me and my apologies to my high school  
2 chemistry instructor for not paying attention enough during  
3 that class. Although I did get an A.

4 A. Good for you.

5 Q. The other question I wanted to ask is we are talking  
6 about retrofitting Big Stone I here. Just jog and refresh my  
7 memory, with that situation is are we looking with mercury, are  
8 we looking at an overall reduction do you think in terms of it  
9 because of the retrofitting in dealing with Big Stone I as well  
10 or does that not apply to mercury or how does that work with  
11 bringing both plants through the same best technology available  
12 today?

13 A. It's my understanding in reading the material at Big  
14 Stone II that at Big Stone II the plan is to put Unit Number  
15 I's flue gases through the scrubber at -- that will be built as  
16 part of this construction. I think that's my understanding.  
17 Based upon that understanding, I would say that the net effect  
18 will be is that it would reduce the amount of mercury coming  
19 out of Big Stone I because now you are going to be capturing a  
20 lot of the oxidized mercury in a higher proportion than what  
21 you had done previously. And I assume that it will also go  
22 through the particulate filter also that is being built  
23 associated with Big Stone II and if that is the correct  
24 understanding, that should also improve the mercury reductions  
25 above and beyond what is already occurring at Big Stone I now.

1 So a higher proportion of it would be removed.

2 Q. You may not be able to answer this. I appreciate that  
3 explanation. Are we looking at we add I and II together, is  
4 that going to be less than I when it comes to mercury or do you  
5 not have the basis to form that sort of conclusion or  
6 evaluation? Behind you they are pointing at somebody in the  
7 back of the room.

8 A. Maybe I should -- I know that they have -- that they  
9 have said it will be less, but maybe yes, maybe we can hear  
10 someone who has done the calculation.

11 MR. ROLFES: Mark Rolfes, project manager. Just to  
12 clarify a couple things, the existing Big Stone I has what's  
13 referred to as an advanced hybrid particulate collector, which  
14 is a form of a fabric filter, so the unit already has a fabric  
15 filter, but it does not have the scrubber. So by the  
16 construction of Big Stone II, we will be adding the scrubber so  
17 we will be removing the water soluble mercury.

18 Now, the project has committed in total mercury  
19 emissions that there will be no increase with the addition of  
20 the second unit, and as I hopefully indicated when I was  
21 testifying, that because of the CAMR rules and our  
22 expectations, we expect the mercury emissions to go down in  
23 that point, but we are guaranteeing and will be in our air  
24 permit that the mercury emissions will not increase from what  
25 the current emissions from what Unit I is today.

1 CHAIRMAN SAHR: Thank you, and that was my  
2 understanding not about the setup on the plant, thank you for  
3 clarifying that, but on the overall levels of mercury and I  
4 appreciate that. Thank you. I have no further questions.

5 MR. SMITH: Any last commissioner questions? I think  
6 what I would like to do is because of the way this has gone, if  
7 you have additional cross that has been stimulated by  
8 commissioner questions, to do that so that when we go back to  
9 Mr. Glaser on redirect, he's got the benefit of all of the  
10 cross-examination that may be opened up by that. Is that fair?

11 MR. O'NEILL: That's fair.

12 MR. SMITH: Why don't we go to you guys and we will go  
13 around the table with the various responding parties here.

14 CROSS-EXAMINATION

15 BY MR. O'NEILL:

16 Q. Mr. Hewson, are you familiar with whether Minnesota  
17 has an externality number for mercury?

18 A. It is my understanding it does not.

19 Q. So would I be correct, then, if I stated that the 1997  
20 PUC order does not assign an externality value for mercury?

21 A. That's my understanding.

22 Q. Would you therefore say that mercury allowance pricing  
23 is zero for today?

24 MR. GLASER: I'm going to have to interpose an  
25 objection because I think we are now beyond the scope of all of

1 the previous discussions, since the previous cross-examination,  
2 I think counsel is going off on something that's just  
3 completely different now. I don't know how that -- what these  
4 questions relate to any of the comments that we had from the  
5 commissioners.

6 MR. O'NEILL: I can sure tell you.

7 MR. SMITH: Please do.

8 MR. O'NEILL: We were discussing mercury and we were  
9 discussing the problems associated with mercury and during my  
10 questioning, I was talking about and Mr. Hewson was talking  
11 about the association of the Minnesota PUC order as it related  
12 to mercury and as it related to CO2.

13 MR. SMITH: Overrule the objection and let's get as  
14 full of exposure of the facts as we can.

15 A. Can you repeat the question? I apologize.

16 Q. (BY MR. O'NEILL) Sure, no problem, you have been on  
17 the stand a long time. Would you therefore say that mercury  
18 allowance pricing is zero today? Would you advise your clients  
19 that mercury allowance pricing is zero today?

20 A. When you say advising, is this an existing plant you  
21 are talking about?

22 Q. What they should plan for.

23 A. I would say that if -- you mean Big Stone II in  
24 particular?

25 Q. Yes.

1           A.    I would say that if I was in Big Stone II, I would  
2 plan to see how I could meet my cap that would be assigned to  
3 me under the state rules and if I needed to buy allowances, if  
4 I had emissions, but I understand they are not going to, if  
5 they are able to achieve that cap, there would be no  
6 additional -- there would be no additional production cost.

7           Q.    If they are not able to meet the cap, what should they  
8 expect for allowance pricing?

9           A.    If they are unable to achieve the emission allocation,  
10 then they would need to buy emission allowances on the open  
11 market.

12          Q.    Do you know what that is today or what are you  
13 recommending clients it will be tomorrow?

14          A.    First of all, the value is going to change. Right now  
15 what we are doing in mercury that makes it a challenge is that  
16 states are going through and deciding whether or not they are  
17 going to participate in a national trading program, and so the  
18 value of mercury in a national trading program will be very  
19 dependent upon those states that are participating. Since we  
20 are not going to know who they all are until September, I must  
21 admit that I've been holding off until we get a definitive  
22 listing. Then I will take my supply curves for each of those  
23 states and determine what would be the marginal cost for the  
24 people who could overcomply, what would be their cost and  
25 therefore what would be logical to assume in terms of what a



1 range of prices may be.

2 Q. Is zero a possibility?

3 A. I don't believe that in a national trading program, I  
4 would not expect to see zero.

5 MR. O'NEILL: Thank you, that's all the questions I  
6 have.

7 MR. SMITH: Ms. Stueve, you didn't have any original  
8 cross. Has anything been stimulated by the commissioners?

9 MS. STUEVE: Yes, and I appreciate the questions and  
10 the answers.

11 CROSS-EXAMINATION

12 BY MS. STUEVE:

13 Q. Mr. Hewson, good afternoon.

14 A. Good afternoon.

15 Q. And you talked about an EPA report, a study on  
16 followed, and I think you used the word utility attributable.

17 A. That's correct.

18 Q. What year was that report?

19 A. Since I wasn't involved, I must admit I will plead  
20 that I do not remember what the month and year was.

21 Q. Okay. Are you familiar with the most recent EPA  
22 report from the Office of Inspector General just released May  
23 15th this year, 2006?

24 A. Could you be more specific? EPA sends lots of reports  
25 out.

1 Q. It is Stueve Exhibit -- there should be a copy of it  
2 there. Let me see -- Stueve Exhibit 1-E.

3 A. The answer is no, I have not reviewed this report.

4 Q. So what you were talking about when you mentioned  
5 study and fallout on utility attributable mercury did not come  
6 from this one?

7 A. No. Hot spots are indeed an issue that we are  
8 debating.

9 Q. Thank you. So obviously you can't answer questions  
10 from this if -- no?

11 A. I'm sorry, without reviewing the report, I can offer  
12 no opinion about the report.

13 MS. STUEVE: All right. I will waive any more  
14 questions. I would ask counsel and intervenors and staff if I  
15 might move for judicial notice of Stueve Exhibit 1-E. Would  
16 there be any objections?

17 MR. SMITH: I'm sorry, I was still trying to find my  
18 copy of it here.

19 MS. STUEVE: I apologize, they were not passed out.  
20 That would be labeled Stueve Exhibit 1-E.

21 MR. GLASER: Could I ask a point of clarification for  
22 myself in terms of procedure? We don't necessarily have a  
23 problem with this, but is the notion that it is a government  
24 report, it was produced by the government and therefore we will  
25 let it in for the fact that it's a government report and it

1 should be in the record. On that basis, I don't think we are  
2 going to have a problem.

3 MR. SMITH: I personally believe it's judicially  
4 noticeable by us and no matter -- I'll certainly entertain any  
5 objections, but I think we can notice this.

6 MR. GLASER: We have no problem.

7 MR. SMITH: Stueve Exhibit 1-E is received on judicial  
8 notice.

9 EXHIBITS:

10 (Stueve Exhibit No. 1-E received into evidence.)

11 MS. STUEVE: Thank you. No further questions.

12 MR. SMITH: Staff.

13 CROSS-EXAMINATION

14 BY MS. CREMER:

15 Q. I believe you said that BSII will emit particulate  
16 matter; is that right?

17 A. I would think that's in the application in terms of  
18 the amount that they are projecting would be emitted.

19 Q. Okay.

20 A. Or it should be.

21 Q. My question is, how does that deposit, locally or  
22 globally?

23 A. Can you --

24 Q. The right side of my brain here is telling me. Let me  
25 see if I can get it over here to the left side. I don't think

1 I can. For some particulate mercury will be emitted; would you  
2 agree with that?

3 A. I would say that I would expect that the particulate  
4 mercury would be removed in the same percentage as the  
5 particulates in terms of them going up the stack, so yes, I  
6 would say that -- I would suspect it would be the same  
7 percentage.

8 Q. Okay.

9 MR. GLASER: If I could ask a clarifying question  
10 because I'm confused. The question started with particulate  
11 matter and then you said particulate mercury and that's two  
12 different things here and I want to make sure we are talking  
13 about the right thing.

14 MS. CREMER: Yeah, I'm reading her handwriting and it  
15 all looks the same to me.

16 MR. GLASER: It's particulate mercury is what your  
17 question was about.

18 MS. CREMER: Yes. I'll try this again and we'll try  
19 to work it out if we are talking matter or mercury.

20 Q. (BY MS. CREMER) You said some mercury will be  
21 deposited locally. No, you didn't say that. Will be emitted  
22 as particulate matter.

23 A. There are three different types, I was talking about  
24 mercury comes up in three different forms. There's a  
25 particulate mercury, oxidized mercury and elemental mercury.

1 Q. So some particulate will be emitted.

2 A. Are you talking about particulate matter? You are  
3 talking about the PM, particulate matter, PM 10?

4 Q. Particulate mercury.

5 A. Particulate mercury. My statement was that I believe  
6 that it would be removed in the same percentage as what  
7 particulates are being removed in that the mercury is being  
8 absorbed onto the particulate matter, it also can be within the  
9 ash.

10 Q. So then concentrating on what's left, that proportion  
11 that you said that would go, there's a very little, but you  
12 said like 99 percent.

13 A. With a baghouse, we are removing -- maybe I should get  
14 Mr. Rolfes up here, what percentage, 99 point how many nines,  
15 something like 99.95 or 99.98.

16 Q. Right, I'm not using it for that -- for percentage  
17 matters. The way -- what I'm trying to get at here is some  
18 particulate mercury will be emitted.

19 A. In theory, if we remove 99.9 whatever it is percent,  
20 we would say that would leave point zero something percent,  
21 point oh something percent and that matter could contain  
22 particulate mercury.

23 Q. Okay, and so all I want to know is how does it  
24 deposit, locally or globally?

25 A. That point 00, it's now an extremely small amount, if

1 it's on large particles, tend to precipitate out quicker, so if  
2 it's associated with an ash particle, that stuff is not  
3 removed, and maybe I should get the percentage that is removed,  
4 that small miniscule amount remaining would probably I would  
5 suspect would be more locally than not.

6 MS. CREMER: That's really all I needed. Thank you.

7 MR. SMITH: Mr. Glaser, after a long hiatus, which I'm  
8 sure you thoroughly enjoyed, do you want to proceed to your  
9 redirect or do you need a break before that?

10 MR. GLASER: No, I think I can think of some  
11 questions.

12 MR. SMITH: Thank you.

13 REDIRECT EXAMINATION

14 BY MR. GLASER:

15 Q. You testified earlier on cross-examination to the  
16 Minnesota Public Utilities Commission having established  
17 certain environmental externality values. Do you recall that?

18 A. I do.

19 Q. And I think you said, correct me if I'm wrong, that  
20 you felt that it was reasonable for the applicants to have  
21 considered those values in looking at potential carbon risk for  
22 Big Stone II; is that correct?

23 A. That's correct.

24 Q. Did you, in your testimony, also look at other ways of  
25 measuring potential carbon risk?

1 A. I did.

2 Q. And why, if you could just summarize for us, why it is  
3 that you felt that the fact that Minnesota had established  
4 externality values at 35 cents to \$3.50 using a damage  
5 methodology, it was nevertheless reasonable for the applicants  
6 to use those values in measuring carbon risk in this  
7 proceeding.

8 A. Measuring carbon risks, one approach, as you might  
9 remember my testimony, I mentioned lots of different ways  
10 people are addressing the carbon issue. One way to do it is by  
11 assigning, like Minnesota, taking a damage value. Of the five  
12 different approaches, they did look at cost compliance and  
13 regulatory risk and elected to do damage cost, so I thought it  
14 was appropriate for the applicants, in that there are indeed --  
15 several of the applicants are from Minnesota, to at least look  
16 at those numbers in their resource evaluation to see whether or  
17 not at those values, even though they do not apply to Big Stone  
18 II in the Minnesota order, but nevertheless to sort of look at  
19 whether or not they would have changed the selection of the  
20 technology, which they did not.

21 Q. And I believe you also testified with respect to the  
22 fact that Minnesota Public Utilities Commission had not  
23 established environmental cost values for mercury; do you  
24 recall that?

25 A. That's my understanding, yes.

1 Q. But nevertheless, I believe you also testified that it  
2 was appropriate for entities in the position of the Big Stone  
3 II co-owners to assess the possibility of future mercury  
4 regulation compliance costs; is that true also?

5 A. I think when we talked about mercury in my testimony,  
6 it was we were deferring to Dr. Denney and using it as an  
7 environmental externality, and my issue with mercury was that  
8 if the applicant does not have emissions, if emissions do not  
9 grow and there is no incremental emissions of mercury, then it  
10 would likely be no incremental damage occurring and so the  
11 environment would be zero.

12 Q. But you also, in responding to questions on Mr.  
13 O'Neill's latest round of cross, mentioned that at least there  
14 was a possibility out there that the applicant would need in  
15 the future to go out into the market and purchase mercury  
16 allowances to meet the EPA at least potentially phase two Clean  
17 Air Mercury Rule requirements; is that correct?

18 A. Right, if they don't -- if they can't reduce their  
19 emissions to the allowable level, what they have in their  
20 allocations, they would be in essence forced to purchase  
21 allowances from some other source that is overcomplying with  
22 their limit.

23 Q. And do you know whether or not the applicants, in  
24 analyzing the potential of Big Stone costs, in fact did look at  
25 potential mercury allowance prices or would that be somebody



1 else that might have done that for the applicants?

2 A. I am not familiar with how they handled mercury in  
3 their evaluation.

4 MR. GLASER: Thank you very much. That's all that I  
5 have.

6 MR. O'NEILL: No further questions.

7 MS. STUEVE: No further questions.

8 MR. SMITH: You are excused. Thank you.

9 A. Thank you very much.

10 MR. SMITH: Does that conclude the -- other than the  
11 cleanup housekeeping matters we discussed, does that conclude  
12 the applicants' case-in-chief?

13 MR. WELK: Yes, it does, Mr. Smith. We have checked,  
14 we have no more live bodies, so to speak, as witnesses. If my  
15 math is correct, we are going to reserve Nos. 92 through 114  
16 for the summaries for the 23 witnesses that testified. Excuse  
17 me, through 115, it was through 115 and so I would like to  
18 reserve Exhibit 116 for the insertion of Mr. Lancaster's  
19 affidavit. It's in transit, he's literally out of the country,  
20 will be sending an affidavit in. So for purposes of the  
21 record, I'd like to reserve 116 for his affidavit, which  
22 remember he didn't testify and the exhibits went in and just to  
23 button that up, he's affirming that testimony.

24 Also I think this Exhibit 25, which was Kiah Harris's  
25 direct, was admitted, he was live, but the court reporter

1 didn't have 25 admitted, but we want to make sure that that was  
2 admitted. He was the engineer that testified live. I thought  
3 we had it.

4 MR. SASSEVILLE: You told me that you had already  
5 received it and then we checked and the court reporter didn't  
6 have it logged in. Based on that --

7 MR. SMITH: I showed it on my list as having been  
8 admitted in connection with the stipulated list, if you will  
9 recall.

10 MR. WELK: He was one of those that was in play  
11 whether he was coming or not so there may be some confusion and  
12 in an abundance of caution, we will reoffer it right now.

13 MR. SMITH: I do show it having been offered and  
14 admitted as part of the original stipulation, but if there's no  
15 objection, we'll just receive it into evidence at this point.

16 EXHIBITS:

17 (Applicants' Exhibit No. 25 received into evidence.)

18 MR. WELK: We now have the exhibits of 92 through 115  
19 for the PowerPoint summaries. I will give those to the court  
20 reporter and if people will tell us which ones they don't have,  
21 we'll get copies for you. I believe with that, the applicant  
22 would rest its case-in-chief.

23 MR. SMITH: Are you moving those in now?

24 MR. WELK: Yes. We will go ahead and do that. These  
25 are -- I'll read these into the record for people for their

1 numbers if you want and then catch up with me. Applicants'  
2 Exhibit 92 is the PowerPoint summary of Ward Uggerud.  
3 Applicants' Exhibit 93 is the PowerPoint summary of Mark  
4 Rolfes. Applicants' Exhibit 94 is the PowerPoint presentation  
5 of Terry Graumann. Applicants' Exhibit 95 is Ray Wahle.  
6 Applicants' Exhibit 96 is from Mike McDowell. Applicants'  
7 Exhibit 97 is Jerry Tielke. Applicants' Exhibit 98 is Stephen  
8 Thompson. Applicants 99 is John Knofczynski. I apologize,  
9 John, for your name that I can't pronounce it. Applicants' 100  
10 is John Lee. Applicants' 101 is Andrew Skoglund. Applicants'  
11 102 is Randall Stuefen. Applicants' 103 is Robert Brautovich.  
12 Exhibit 104 of the applicant is Jeffrey Grieg. Applicants' 105  
13 is Stephen Gosoroski. Applicants' 106 is Kiah Harris. Peter  
14 Koegel's summary presentation PowerPoint is 107. Bryan Morlock  
15 is 108. Stan Selander is 109. Larry Anderson is Exhibit 110.  
16 David Gaige, Exhibit 111. Hoa Nguyen is Exhibit 112. Robert  
17 Davis 113, Daniel Klein 114, and Thomas Hewson 115. Those are  
18 all the PowerPoint presentations. I would move for the  
19 admission of those exhibits.

20 MR. SMITH: Is there an objection?

21 MR. O'NEILL: No objection.

22 MS. STUEVE: No objection.

23 MR. SMITH: Applicants' Exhibit Nos. 92 through 115  
24 are received into evidence.

25 EXHIBITS:

1 (Applicants' Exhibit Nos. 92 through 115 received into  
2 evidence.)

3 MR. WELK: With that, we will rest our case-in-chief.

4 MR. GLASER: I have one housekeeping matter. Mr.  
5 Hewson, in response I think to Commissioner Sahr, indicated  
6 that there was an EPA report that might answer some questions  
7 and I guess our question is should we be submitting that for  
8 the record, supplying a citation, or what's your pleasure in  
9 terms of handling that?

10 MR. SMITH: I guess you can do either one. I guess it  
11 would be nice to at least have it identified with enough  
12 specificity so we can find it.

13 MS. CREMER: Is that that eight volume report?

14 MR. GLASER: Is that that eight volume report? No.

15 MR. HEWSON: No, it's not that eight volume report.

16 MS. STUEVE: Actually, in Stueve Exhibit 1-E, is that  
17 what just got received, it actually -- that report is --

18 MR. SMITH: Is referenced in there?

19 MS. STUEVE: This is the report that comes because of  
20 the report he was referring to.

21 MR. GLASER: We don't -- I would like to ask Mr.  
22 Hewson that before we agree to that. I think probably the best  
23 thing for us to do would be to provide a Web citation to the  
24 report. We can do that as soon as Mr. Hewson gets back to his  
25 office or calls his office or something to that effect.

1 MR. SMITH: You are perfectly welcome if you want to  
2 to use our office facilities downstairs and if you want to pull  
3 it up, if it's not a humongous document, to pull it up, print  
4 it and if it's an official EPA report, I would just request  
5 that we enter it into the record on judicial notice and we will  
6 be done with it. My suggestion is it's now 3 o'clock and that  
7 we are in a logical break point and that we take a break and  
8 think about what we want to do for the rest of the day, whether  
9 we want to be done for the day or whether we want to forge  
10 ahead and begin with. . .

11 VICE-CHAIR JOHNSON: Mr. Smith, I would suggest that  
12 we continue, no insult meant to the Pierre Chamber of Commerce,  
13 but I suspect people here don't necessarily need that much more  
14 recreation time in Pierre and I'd like to stay on track or  
15 ahead as opposed to have us fall behind.

16 MR. SMITH: What I thought, we have been at this quite  
17 a while now and if we take 15 minutes or so so we can all think  
18 about what should happen next, I think that's beneficial for  
19 everybody.

20 VICE-CHAIR JOHNSON: Did we decide late yesterday that  
21 Ms. Stueve would go next and if we did and if she is ready,  
22 would there be any reason to depart from that? It just seems  
23 to me that we may want to decide before break because somebody  
24 might be able to use that break for preparation time.

25 MR. SMITH: Ms. Stueve, do you mind going next? That

1 would probably be honestly the -- as logical an order as any.

2 MS. STUEVE: I would not mind.

3 MR. SMITH: Okay, why don't we do that, then, and how  
4 long would you like in order to prepare yourself?

5 MS. STUEVE: Even 15 minutes.

6 MR. SMITH: Do you want 15 minutes? It's about  
7 exactly 3 o'clock so we will be in recess until a quarter after  
8 3:00.

9 (Whereupon, the hearing was in recess at 3:00 p.m.,  
10 and subsequently reconvened at 3:23 p.m., and the following  
11 proceedings were had and entered of record:)

12 MR. SMITH: The hearing is reconvened following our  
13 afternoon recess. Excuse me, the hearing is reconvened  
14 following our afternoon recess, and at this time Ms. Mary Jo  
15 Stueve, an intervenor in the case, she will present her direct  
16 case. Ms. Stueve, please take the witness stand. Ms. Stueve  
17 is appearing pro se.

18 Thereupon,

19 MARY JO STUEVE,  
20 called as a witness, being first duly sworn as hereinafter  
21 certified, testified as follows:

22 MS. STUEVE: Good afternoon. This is my direct  
23 testimony filed May 19th before the South Dakota Public  
24 Utilities Commission in case number EL05-022. I prepared  
25 myself what is contained herein and I do have two minor

1 corrections.

2 MR. SMITH: Please point those out to us.

3 MS. STUEVE: Stueve Exhibit 1 in the direct prefiled  
4 testimony, line 10.

5 MR. SMITH: What page are we on?

6 MS. STUEVE: We are on page one, line 10, and 9,000  
7 could be crossed out and current numbers midway year here are  
8 7,791. And on page two of Stueve Exhibit 1 prefiled direct  
9 testimony, line four, we can now put in grandmother of four  
10 comma versus three.

11 MR. SMITH: Congratulations.

12 MS. STUEVE: Rebecca Jo, after her grandmother, I  
13 believe.

14 MR. SMITH: Is that all?

15 MS. STUEVE: Those are all the corrections.

16 MR. SMITH: Do you, Ms. Stueve, want to do as the  
17 other witnesses for the applicant have done and spend some time  
18 in presenting a summary at least of your -- of what's contained  
19 in your Exhibit Stueve 1 for the commission and the other  
20 parties?

21 MS. STUEVE: Yes. Yes, thank you. Well, first off,  
22 my name is Mary Jo Stueve, a new resident of South Dakota,  
23 quite recent actually. I am located at 196 East Sixth Street  
24 in Sioux Falls. I also maintain a home at 518 St. Joseph  
25 Avenue in Graceville, Minnesota and have agricultural land, Big

1 Stone and Traverse County. I'm currently employed by Clean  
2 Water Action as state coordinator. And Clean Water Action has  
3 a long history of supporting citizen efforts nationwide to  
4 protect water resources, promote sound solid waste management,  
5 push for agricultural policies that strengthen communities and  
6 work for transition to clean renewable energy.

7 My educational background includes a master of arts,  
8 2004, in international policy studies with a certificate in  
9 nonproliferation from the Monterey Institute of International  
10 Studies. I also have a master of public affairs from the  
11 University of Minnesota's Hubert H. Humphrey Institute of  
12 Public Affairs and a bachelor of arts in sociology and Latin  
13 American studies from the University of Minnesota Morris.

14 My work history includes 24 years on a family farm  
15 raising four children. It also includes more than 24 years  
16 volunteering in civic engagement affairs, working with rural  
17 communities, youth groups, mentoring and role modeling. Most  
18 recently I was an AmeriCorps VISTA, Volunteer in Service to  
19 America before I joined on with Clean Water Action. So I have  
20 a concern and I have worked tirelessly over the course of my  
21 life to understand and improve socioeconomic living conditions,  
22 inequalities, housing and health conditions for families in  
23 communities in both rural and urban settings in the United  
24 States as well as outside our borders in Mexico and Cuba.

25 When I went back to school to acquire two master's



1 degrees, it included studying and researching extensively with  
2 colleagues around the world. The Humphrey Institute and at the  
3 Monterey Institute, mid career professionals such as lawyers  
4 and government officials, NGO, program officers, personnel and  
5 representatives in U.S. military officers, among others, were  
6 ones I studied with on issues related to governance,  
7 accountability and leadership for the common good.

8 My studies, my life, and Big Stone County being my  
9 homeland led me to a decision to participate, in particular to  
10 preserve and protect quality of life, health and social and  
11 economic well-being as an interested person, according to  
12 49-41B-17, SDCL.

13 In summary, my concerns mainly consist with the health  
14 impacts on human population with regards to mercury, and I  
15 appreciate the consideration being given this serious matter.  
16 The purpose and summary of this testimony is to produce and  
17 submit to the commission's official docket file for the public  
18 record my objections regarding granting a permit and to  
19 document sources supporting such. It's my belief, as I state  
20 here in my testimony on page 3-19, that mercury poses  
21 unacceptable risk to our children, our health, our environment,  
22 our future.

23 Throughout my testimony I list different articles from  
24 science journals, medical groups, such as the study from the  
25 Mount Sinai School of Medicine in New York entitled Public

1 Health and Economic Consequences of Methyl Mercury Toxicity to  
2 the Developing Brain, the findings of the Center For Children's  
3 Health and the Environment at Mount Sinai School of Medicine.

4 I also cite a review of that report titled Mercury  
5 Exposure Linked to Loss of IQ and Billions in Societal Costs.  
6 In addition, the 1997 Mercury Study Report to Congress, an  
7 American Nurse article and other health care groups that are  
8 suing the EPA to prevent future mercury exposure. A report  
9 called Staying Ahead of the Feds, Epa Proposes Cap and Trade to  
10 Cut Back on Mercury Emissions But Many States Think They Have a  
11 Quicker, Better Solution. That was a report by Larry Morandi,  
12 State Legislatures, June 2005, 31, 6, Research Library, page  
13 14.

14 Other reports are cited throughout. And I appreciate  
15 being able to present testimony for consideration in the  
16 decision being made. Thank you.

17 MR. SMITH: Ms. Stueve, at this point in time, then,  
18 did you want to offer your direct testimony, including the  
19 attached exhibits, into evidence?

20 MS. STUEVE: I would.

21 MR. SMITH: Are there objections from the parties?

22 MR. SASSEVILLE: No objections.

23 MR. SMITH: Your Exhibit A, which is your direct  
24 testimony, and the exhibits thereto, are admitted into  
25 evidence.

1 EXHIBITS:

2 (Stueve Exhibit A received into evidence.)

3 MR. SMITH: I'm going to bring up one other matter  
4 since you are on the stand and that is your exhibit that you  
5 have used in a couple of testimonies here and that is you have  
6 shown to witnesses but I don't believe it has been offered or  
7 received into evidence and that is your Exhibit 1-D, which is a  
8 PowerPoint presentation that appears on its face to have been  
9 prepared by Otter Tail. And I guess at this point in time you  
10 are pro se so I'm going to help you along a little bit here.  
11 In order to lay a foundation for that, you may wish to inquire  
12 whether there is someone here in attendance from Otter Tail who  
13 is familiar with that document that you could call as a witness  
14 to lay a foundation for what that is and to then seek to admit  
15 it into evidence. Would you like to do that?

16 MS. STUEVE: Yes.

17 MR. SMITH: I just want to inquire, Mr. Rolfes, Mr.  
18 Uggerud, is there anybody here who is familiar with that  
19 document that I'm talking about and that's that report to the  
20 commission at the coal meeting? Is there anybody here that  
21 could address that so that she could --

22 MR. SASSEVILLE: Mr. Smith, I think we are referring  
23 to the Update on Rail Issues at Otter Tail Power Company dated  
24 April 21, 2006. We will stipulate to the admissibility.

25 MR. SMITH: You will, okay.

1 CHAIRMAN SAHR: I was going to say it's probably a  
2 business record unless someone can show otherwise.

3 MR. SMITH: I think it might be on our Web site. So  
4 it's probably a public record. Thank you very much.

5 MR. SASSEVILLE: You're welcome.

6 EXHIBITS:

7 (Stueve Exhibit No. 1-D received into evidence.)

8 MR. SMITH: With that do you want to tender yourself  
9 for any cross-examination?

10 MS. STUEVE: I will tender myself for any  
11 cross-examination, I think.

12 CHAIRMAN SAHR: It sounds almost painful.

13 MS. STUEVE: It sounds dubious.

14 MR. SMITH: Believe me, I've been a witness in some  
15 big cases and it can be painful.

16 VICE-CHAIR JOHNSON: Nothing like intimidating the  
17 witness, Mr. Smith.

18 MS. STUEVE: I might add am I not the first woman to  
19 be sitting in this seat in these proceedings?

20 MR. SMITH: That could be. As Tom Welk knows, I was  
21 one of the expert witnesses in the ETSI Pipeline antitrust  
22 case, so I know what it feels like. Do the applicants have any  
23 cross-examination of Ms. Stueve?

24 MR. SASSEVILLE: Not at this time.

25 MR. SMITH: Do joint intervenors have

1 cross-examination?

2 MS. GOODPASTER: Just one question.

3 CROSS-EXAMINATION

4 BY MS. GOODPASTER:

5 Q. Ms. Stueve, throughout these proceedings you have been  
6 very involved in the discussions and have sought a lot of  
7 information from the applicant witnesses and I understand from  
8 your testimony that your concerns are rooted in your interest  
9 in agricultural land across the border, your residence here in  
10 state and your concerns about mercury and would it be fair to  
11 guess that your concerns might relate to the four grandchildren  
12 you have?

13 A. Yeah, at the forefront.

14 Q. I'd like to ask you whether, in raising the questions  
15 you have today and on previous days, whether you feel like this  
16 proposed power plant is in the public interest or is -- you are  
17 still concerned about the environmental impact it may have?

18 A. I remain concerned about the environmental impact it  
19 might have. My concerns have not been fully answered as far as  
20 the application as it stands as a proposed project and as it  
21 stands, it has not alleviated my concerns, especially with  
22 regards to the mercury issue. Border land out there, Grant and  
23 Roberts, Big Stone, Lac qui Parle, the lake that speaks French,  
24 I don't, it's my homeland. My dad and my grandpa built a cabin  
25 on Big Stone Lake and I had nine siblings and many cousins and

1 my dad still lives on Big Stone Lake and he likes to catch fish  
2 just like his grandpa did before him and say, hey, providing a  
3 meal on the table, kids and grandkids, and I can't feed those  
4 nice big walleyes to my young daughter that was expecting.  
5 It's a concern.

6 MS. GOODPASTER: Thank you, Ms. Stueve.

7 MR. SMITH: I'm looking over there for Ms. Stueve.  
8 Ms. Cremer, does staff have any cross-examination of Ms.  
9 Stueve?

10 MS. CREMER: No, we do not. Thank you.

11 MR. SMITH: Do you have any cross in -- well, I  
12 guess --

13 COMMISSIONER HANSON: No, I don't.

14 MR. SMITH: Do commissioners have any questions?

15 CHAIRMAN SAHR: I guess I just have a comment and I'm  
16 sure it goes for all three of us. I want to say thank you for  
17 appearing and I think most people at the table probably are  
18 getting paid right now and maybe you are partly through your  
19 job, I don't know, maybe you aren't, but we know it's certainly  
20 not necessarily the easiest thing to do to sit through a week  
21 long hearing and preparing, so thank you for coming to town.

22 MS. STUEVE: Thank you. I can comment to that. My  
23 life as a mother and farmed for 24 years prepared me well to  
24 work double, triple shifts, you know, twenty-four seven, so  
25 when I leave here, no, it's a whole other shift because I can

1 work electronically and I cover the state of South Dakota,  
2 actually, Clean Water Action. So I am going to sleep well when  
3 this ends, believe me.

4 MR. SASSEVILLE: For what it's worth, the applicants  
5 do appreciate, too, your involvement and the contribution to  
6 this proceeding and we are hopeful that we have tried our best  
7 to alleviate the concerns that you have expressed.

8 EXAMINATION

9 BY VICE-CHAIR JOHNSON:

10 Q. Ms. Stueve, I will echo everybody's sentiment that  
11 it's good to have you here and thank you for your  
12 participation. You spoke eloquently about your concerns about  
13 mercury. I wanted to get your take on the applicants'  
14 commitment to reduce mercury levels to or below the emission  
15 levels of Big Stone I today for both plants in the future.  
16 What are your thoughts?

17 A. And my thoughts, I will have to be the first to admit  
18 I would not have had any thoughts if you would have asked me  
19 this time last year. It's been a learning curve for me. My  
20 one concern I have, when the applicants talk about equal  
21 emissions to current at 2004, is that Big Stone Plant Unit I  
22 came in at a time when there was literally not any awareness of  
23 health concerns with mercury and it was what is called  
24 grandfathered in, and so in light of that, when we are looking  
25 at the Clean Air Mercury Rule, in light what we know about

1 mercury, what the new emission budgets will be for South  
2 Dakota, for the U.S. as a whole in light of these health  
3 concerns, it bothers me that we are looking at increments down  
4 to, what, 44 pounds by 2018 and so 189 pounds is a lot higher  
5 than 44 pounds. And I realize steps need to be taken  
6 incrementally. This was a long time in coming and yet the 189  
7 just does seem -- seems a long way from the eventual, what is  
8 it, I can't even think of the number I said.

9 Q. Ms. Stueve --

10 A. By 2018.

11 Q. Ms. Stueve, it's my understanding that in 2018 the cap  
12 of 44 pounds would apply whether there are one or two power  
13 plants in South Dakota. Is that your understanding as well?  
14 And I do understand you are an expert in this issue only when  
15 compared to me.

16 A. South Dakota state budget, it's my understanding that  
17 at 2010 it goes down to 144 pounds and by 2018 I believe it's  
18 lowered even to 58 pounds.

19 Q. That's right, thank you. My last question would be I  
20 was struck by some of your direct testimony, some of your  
21 opening statement about concern for people who don't have a  
22 lot, particularly in housing and nutrition, education for those  
23 folks, I am paraphrasing your comments, because I share many of  
24 those concerns. What was your reaction on a personal level to  
25 the testimony of Mr. Klein, what I will call the healthier --



1 wealthier is healthier testimony? Any thoughts about what the  
2 effect that lower -- low power -- the low energy costs have  
3 toward lower income folks?

4 A. Oh, yes. I found his presentation engaging. I had  
5 lots of questions, even with the South Dakota employment  
6 average I noticed in his projections, I believe it was around  
7 38,000 in his testimony, and I'm thinking out in that area of  
8 northeast South Dakota and the Big Stone, Lac qui Parle,  
9 Roberts and Grant, many people live on between \$10,000 and  
10 \$28,000 a year, and so yes, there's an issue. And yet what are  
11 we going to do? What do we want to trade off? What do we want  
12 to trade off? And before a decision gets made, we have to know  
13 the full story. We have to know the full story. Oftentimes  
14 people welcome something, for example, a coal power plant  
15 coming in because of the jobs promised and we do need jobs out  
16 there, and yet what's the risk? What are we weighing? And we  
17 don't know that.

18 VICE-CHAIR JOHNSON: Thank you very much, Ms. Stueve.  
19 That's all I have.

20 MR. SMITH: Other commissioner comments, questions?  
21 Ms. Stueve, then, in response to that rigorous  
22 cross-examination, do you have any redirect testimony that you  
23 would like to -- any last things you would like to say?

24 MS. STUEVE: I would like to -- is -- Mr. Nguyen, I  
25 would like to mimic the comment he made earlier, the

1 appreciation I have for being in a place where the public can  
2 participate in such a decision as this.

3 MR. SMITH: Thank you. If that concludes your  
4 testimony, then you are excused.

5 MS. STUEVE: That concludes my testimony.

6 MR. SMITH: I will make an announcement related to the  
7 public comment, which kind of follows up on what you just said.  
8 I think we have secured the use of 412 for that, assuming -- I  
9 don't know whether a few people or a lot will come. But I  
10 think we will be able to have it here. Since we noticed it for  
11 413, which is right next door, we will post a placard which  
12 directs people in here rather than in there. That said, we are  
13 still stuck in room 413 tomorrow for the parties' hearing, the  
14 actual formal part of the hearing. We will still have to move  
15 this evening or this afternoon when we are done. I regret  
16 that.

17 Okay, the order of parties' presentations discussed  
18 yesterday, we had discussed, because of the problems with one  
19 of your witnesses who had some personal issues and the ability  
20 of the various parties then to be able to be ready for that, I  
21 think we had concluded that we would begin to proceed at least  
22 with staff's case-in-chief despite the fact that that's an  
23 unusual order for things and does my understanding reflect  
24 reality, staff? As I understand it, you want to at least take  
25 witness Madden's examination today.

1 MS. CREMER: Yes, that would be true.

2 MR. SMITH: Are you ready to proceed at this time?

3 MS. CREMER: We are, thank you.

4 MR. SMITH: Call your first witness.

5 MS. CREMER: He's ready to go fishing.

6 Thereupon,

7 MICHAEL K. MADDEN,

8 called as a witness, being first duly sworn as hereinafter

9 certified, testified as follows:

10 DIRECT EXAMINATION

11 BY MS. CREMER:

12 Q. Would you state your name and address for the record,  
13 please?

14 A. Yeah, Michael K. Madden, I live at 63 Langden Road,  
15 Buffalo, Wyoming.

16 Q. Would you summarize your educational background for  
17 us, please?

18 A. Yeah, I have a bachelor's degree in economics and math  
19 from South Dakota State and I have a doctorate from Iowa State  
20 University in economics and statistics.

21 Q. Thank you. And what is your employment history?

22 A. I've been a college professor most of my life at the  
23 University of Wyoming, at South Dakota State University, at the  
24 University of South Dakota, and at National American University  
25 I was an administrator, I was dean of graduate studies. During

1 all that time, I was doing consulting work similar to this.

2 Q. And you were employed by the commission to consult  
3 with staff on this case; is that right?

4 A. I was.

5 Q. Can you tell us in a general way what approach you  
6 used to gather the materials that you used to produce the study  
7 in order to file prefiled testimony today and then also to  
8 testify?

9 A. Yeah, I wanted to use historical analogy I guess  
10 mostly and that is to compare what happened to these various  
11 sectors that I studied in 1970 to 1975 when they built Big  
12 Stone I. And because the wage -- or the employment impact is  
13 about a 37.6 percent bump in Big Stone II, it is 36.5 in Big  
14 Stone I, it turned out to be an ideal historical analogy.

15 Q. Okay, thank you. And as a part of your review of this  
16 or your analysis of this matter, did you review SDCL, South  
17 Dakota Codified Law 49-41B?

18 A. I did.

19 Q. And then did you also review Administrative Rules of  
20 South Dakota 20:10:22, which were the siting rules?

21 A. Yes, I did.

22 Q. And in front of you are some exhibits. They are  
23 directly in front of you.

24 A. Up here?

25 Q. Yes. Those have been marked for identification

1 purposes. Do you have Exhibit 1?

2 A. Yes, I do.

3 Q. Can you tell us what that is?

4 A. That's the document that I prepared. It must be  
5 several copies, however.

6 Q. I believe it's your prefiled testimony and then the  
7 study is attached with it.

8 A. Oh, yes, because I did attach the study with my  
9 prefiled testimony, that's right.

10 Q. Even though you told me you are perfect and don't, but  
11 I'll ask you anyway, do you have any additions or deletions or  
12 corrections?

13 A. No, I don't.

14 Q. And if I asked you those same questions today that  
15 appear in your testimony, would your answers be the same?

16 A. Yes, they would.

17 MS. CREMER: I would offer Exhibit 1.

18 MR. SMITH: Is there objection?

19 MR. MADSEN: Applicant has no objection.

20 MS. STUEVE: No.

21 MR. SMITH: Joint intervenors? Staff's Exhibit 1 is  
22 admitted into evidence.

23 EXHIBITS:

24 (Staff Exhibit No. 1 received into evidence.)

25 Q. (BY MS. CREMER) Would you please summarize your

1 prefiled testimony and then the attached study?

2 A. Yeah. Basically what I found, I went through all of  
3 these sectors here, health, agriculture, manufacturing,  
4 housing, wholesale and retail trade, and found that among them,  
5 the sectors that will be positively impacted economically is  
6 leisure travel, the health industry will, the retail industry  
7 will be positively impacted. There won't be any significant  
8 impacts on agriculture and manufacturing and wholesale trade.  
9 And there will be potentially negative impacts in the housing  
10 industry that can be mitigated to one degree or another by the  
11 owner.

12 Q. And what sort of mitigation do you recommend that  
13 they --

14 A. Well, the critical thing, because housing is a fixed  
15 asset or fixed in supply, the critical thing is to disburse the  
16 manpower away from the towns that are right next to the  
17 project, and you can do that with salary differentials to  
18 encourage people to live in Watertown or somewhere else. The  
19 owner could supply bus transportation as another incentive. Of  
20 course another important one would be to negotiate contracts  
21 with motels, and there's an ample number of motels up in that  
22 area, to house as many people as possible in motels.

23 Q. I think you are referring to table two in your  
24 testimony when you talk about the positive impacts on travel  
25 and health and agriculture; is that right?

1 A. Yes.

2 Q. Could you expand just a little bit what the positive  
3 impact on travel and that would be?

4 A. Yeah, most all of the positively affected sectors will  
5 be positively affected through revenue enhancements. Some  
6 retail sectors will go up in volume by up to 40 to 45 percent.  
7 They will also have increases in labor costs and these labor  
8 costs is a ballpark estimate. There's going to be probably a  
9 15 percent increase in real wages and overall 15 percent growth  
10 in employment, but since labor costs is a subset of the total  
11 amount of cost that these retail outlets have, the net effect  
12 is clearly positive.

13 And the health industry, basically it's positive  
14 through a revenue impact. There's lots of excess capacity in  
15 the health industry up there I noticed on my visit up there.  
16 So it's probably going to help that industry a lot.

17 Q. They have asked that you move a little closer to the  
18 mike.

19 A. Sure.

20 Q. Does that summarize your study, then?

21 A. Yeah, I think this -- the thing I want to iterate is  
22 that I guess from a policy standpoint, what I'd recommend is  
23 that whatever could be done to keep these temporary workers as  
24 much out of the rental market as possible will be a benefit  
25 that will really accrue over a long period of time to that

1 community. I live out in Wyoming and I see what's happened in  
2 some of the areas there and when I talk about a negative impact  
3 on the rental housing market in that area, I'm talking up to,  
4 could easily be \$300 a month or \$400, which is \$4,000, and what  
5 that does is displace people that are your normal tenants that  
6 will be forced to move somewhere else and whether or not they  
7 come back is another question.

8 But I've been listening for two days around here  
9 talking about externalities and this is an externality. The  
10 people that are going to be displaced by these inflated rents  
11 for a couple, three years, you know, they are not a party to  
12 this transaction at all, but they are the ones that's going to  
13 be paying the price. When I looked at it, I took a visit of  
14 the area and I could see there's really nothing but good coming  
15 from it except for that one issue I think needs to be  
16 addressed, and with higher gas prices, you know, it's going to  
17 be even worse because if a person has a 100-mile round trip  
18 commute, at 20 miles per gallon, that's five gallons of  
19 gasoline at \$3 a gallon, that's \$15 a day to go to work. Say  
20 they pair up with each other, so you got two people riding in a  
21 car, it's about \$8 a piece, so that's a dollar an hour as a  
22 break even point for a person to live in Watertown as opposed  
23 to Big Stone City or Milbank. If gasoline is \$4 an hour by the  
24 time you start turning dirt up there, a dollar an hour  
25 adjustment in salary isn't going to be enough to compensate



1 people and they will want to camp right next to the gate  
2 probably.

3 MS. CREMER: Thank you. That's all staff has for this  
4 witness.

5 MR. SMITH: Applicants, cross-examination.

6 MR. MADSEN: Applicants have no cross-examination for  
7 Dr. Madden, thank you.

8 MR. SMITH: Joint intervenors.

9 MS. GOODPASTER: Joint intervenors have no questions.

10 MR. SMITH: Ms. Stueve, do you have any questions?

11 MS. STUEVE: I do have one question.

12 CROSS-EXAMINATION

13 BY MS. STUEVE:

14 Q. Because you talked about the housing or it sounds like  
15 your assessment was everything else turned out positive. You  
16 looked at it historically; is that correct? So are you able to  
17 give an opinion on projecting into the future, for example, on  
18 housing or economic development around the lake?

19 A. You mean after the facility is built?

20 Q. Absolutely.

21 A. Well, from the standpoint -- what I looked at is  
22 economic impacts, you know, and assuming that the environmental  
23 impacts are going to be acceptable, the economic impacts will  
24 not be really significant after it's built. I think their  
25 employment numbers are 35 to 45 people is all it takes to run

1 that -- additional people is all it takes to run it. And  
2 there's a cheese company up there I interviewed that are hiring  
3 50 people, I don't know, about the same time. So it's not a  
4 big -- it's not a big economic impact. It's just kind of in  
5 line with what you would expect.

6 Q. So follow up to that, that sounds like with the  
7 assumption that the environmental impacts would be acceptable,  
8 for example, if it wasn't a mercury laden lake where we might  
9 lose --

10 A. That's right.

11 Q. -- land value along the lake.

12 A. I did not take into any consideration the possibility  
13 of an environmental degradation that would destroy, you know,  
14 the lake. I made the assumption that these commissioners  
15 wouldn't approve of a system that would do that.

16 MS. STUEVE: Thank you. No further questions.

17 MR. SMITH: Commissioner questions.

18 EXAMINATION

19 BY VICE-CHAIR JOHNSON:

20 Q. I'm flying a little blind here, Dr. Madden. I'm  
21 trying to find the local review committee report. I think it  
22 would have come in in February or March of this year. I'm  
23 having a hard time pulling it up. Have you reviewed that local  
24 review committee report?

25 A. Yes, I have.

1 Q. Did you find that any of the recommendations of the  
2 local review committee didn't make sense, given what you  
3 learned historically from the effects of Big Stone I?

4 A. I think, I'm not sure, I think that was the committee  
5 that suggested maybe involvement of the South Dakota Housing  
6 Authority to subsidize rents or something, and clearly I'm not  
7 a policymaker, but I don't think the housing authority should  
8 be burdened with a cost that was not caused by -- or I should  
9 say that is caused by economic events that are easily  
10 identified. There's an externality there that can easily be  
11 taken care of.

12 The other thing, I think that document also addressed  
13 the possibility of a rent control commission and I didn't bring  
14 that up as a possible solution in my study because I just don't  
15 think that -- South Dakota isn't used to that and if you were  
16 going to do that, you would have to have a rent control  
17 commission established and as of yesterday almost because as  
18 soon as the word gets out, there's going to be that kind of  
19 activity, the horse is already out of the barn, so to speak.  
20 So yeah, I did read it and I know that they say that there  
21 could be a housing shortage, but I think maybe in their  
22 enthusiasm or something they really kind of downplayed the  
23 magnitude of what -- I mean, maybe they have never been to  
24 places like I have where rents get so out of hand, and of  
25 course they wouldn't get out of hand if it was a long run

1 phenomenon, but knowing there's only two years or three years  
2 of window here, you are not going to see new apartment houses  
3 being built. If it was a 25-year window, you would. But with  
4 that short of time, the only response that that market can  
5 accommodate is an increase in rents, and like I say, they may  
6 not have ever seen that, but I have.

7 Q. Thank you, Dr. Madden. I thought your report did a  
8 good job of not just looking at the effects of Big Stone I  
9 while construction was going on but also in the couple of years  
10 that followed, what happened with employment numbers --

11 A. How it goes back.

12 Q. -- what happened to population, absolutely. Is there  
13 a hangover effect of a community, of a four-county area, after  
14 everybody moves in and then they leave, the population  
15 obviously decreased after the construction workers left, but do  
16 raw numbers tell the whole story? Did you pick up any feeling  
17 as to any hangover?

18 A. Well, it's kind of maybe similar to somebody having a  
19 good job where maybe he makes \$150,000 a year and the job is  
20 over in two years and you have to tighten your belt up and get  
21 back to a \$40,000 a year budget. And that's kind of what they  
22 went through. I talked to a lot of old timers up there that  
23 remember -- well, they really weren't old timers, they weren't  
24 much older than me, but that were around when Big Stone I was  
25 built, and they said it was a going Suzie, so to speak, during

1 that thing, but it really slowed down when they left. But the  
2 other thing that -- it seemed like there was a gain there that  
3 they never really went back to the level that -- it wasn't a  
4 snapshot of 1971 and then in 1976 we are right back to '71.  
5 There was a gain there. I didn't go into any detail of why  
6 that might have happened.

7 VICE-CHAIR JOHNSON: Thanks. That's all I have, Mr.  
8 Smith.

9 MR. SMITH: Commissioner Hanson, do you have any  
10 questions?

11 COMMISSIONER HANSON: No, thank you.

12 EXAMINATION

13 BY MR. SMITH:

14 Q. I have one question here and it's general and maybe  
15 staff's counsel can bring it up, but the relatively few numbers  
16 of people that will remain on as the permanent work force  
17 there, there will be other positive economic benefits, will  
18 there not, following the construction of this project, such as  
19 local and county property taxes, materials purchases and the  
20 like? Those will continue to have a positive impact, will they  
21 not, out into the future?

22 A. Oh, yes. It definitely will. I didn't look at the  
23 fiscal, the fiscal impacts, but I'm sure there's going to be --  
24 it did before with Big Stone I, it changed the whole structure  
25 of the local government and it shows.

1 MR. SMITH: Thank you. Does staff have any redirect?

2 MS. CREMER: I do not, thank you.

3 MR. SMITH: I think we are done and I think you can be  
4 excused.

5 THE WITNESS: Thank you very much.

6 MR. SMITH: Staff, please call your next witness.

7 MS. CREMER: Staff, would you call Dr. Denney.

8 Thereupon,

9 OLYESA DENNEY,

10 called as a witness, being first duly sworn as hereinafter  
11 certified, testified as follows:

12 DIRECT EXAMINATION

13 BY MS. CREMER:

14 Q. Would you state your name and address for the record,  
15 please?

16 A. My name is Olesya Denney, O-L-E-S-Y-A, D-E-N-N-E-Y,  
17 and my address is 6110 Cheshire, C-H-E-S-H-I-R-E, Lane North,  
18 Plymouth, Minnesota.

19 Q. Could you summarize your educational background for  
20 us?

21 A. I have a Ph.D. in economics from Oregon State  
22 University. I also have a master's of science from Oregon  
23 State University also in economics, and I have a bachelor's  
24 degree in economics from a university in Russia.

25 Q. And would you tell us your work history?

1           A.    While in Russia, I spent six years doing academic  
2 research in the field of natural and environmental economics at  
3 a research institute. I also taught a course of natural and  
4 environmental resource economics at a university in Russia. I  
5 have five years of regulatory experience here in the U.S.,  
6 mostly in telecommunications area, working first at AT&T in  
7 Denver and then for QSI Consulting, which is my current  
8 employer, and I am employed by QSI Consulting as a senior  
9 consultant.

10          Q.    You were employed by the commission to consult with  
11 staff on this matter; is that right?

12          A.    Yes.

13          Q.    And can you tell us in a general way what you reviewed  
14 or analyzed in order to file prefiled testimony and testify  
15 today?

16          A.    I reviewed the materials of the case, which included  
17 the application, all the prefiled direct, rebuttal, surrebuttal  
18 testimony by all the parties, discovery responses that I was  
19 able to obtain, the transcript of the prehearing -- of the  
20 public hearing in Milbank in September 2005, the applicable  
21 portions of the South Dakota Codified Law and Administrative  
22 Rules that relate to the facility siting, various material by  
23 the EPA, the Environmental Protection Agency, and academic  
24 literature. I'm probably missing some category here. And of  
25 course one of the important things was the materials related to

1 the PSD, prevention of significant deterioration, permit, which  
2 the applicants applied for and the Department of Environment  
3 and Natural Resources of South Dakota issued a draft permit and  
4 statement of basis.

5 Q. Did you submit any data requests to any of the  
6 parties?

7 A. Yes.

8 Q. And were those responded to in a timely fashion?

9 A. Yes.

10 Q. And in front of you there are exhibits that have been  
11 marked for identification purposes and if you would look at  
12 Exhibit 2, could you tell us what that is?

13 A. Exhibit 2 is my direct testimony.

14 Q. Did that have attachments with it?

15 A. Yes, it should have two attachments, A and B. 2-A is  
16 my CV or my resume and 2-B is my quantitative analysis, which  
17 was actually an Excel file printed out in PDF here.

18 Q. Do you have any additions or deletions or corrections  
19 to that testimony?

20 A. Yes, I have three corrections to this exhibit and its  
21 attachments.

22 Q. And could you tell us what those are, please?

23 A. Yes, the first correction is on page 35, and it's  
24 footnote 94.

25 Q. What is that correction?



1           A.    The second line says "willingness to pay all  
2 electricity," it should say "willingness to pay for  
3 electricity." The second correction is on page 39, and it's in  
4 table 6B, so there was no line numbers there. The second line  
5 of the title of the table has the word "literature," this word  
6 should be corrected to say "California PUC." The third  
7 correction is in Exhibit 2-B on page three and it is the same  
8 table, the second line the title has the word "literature," it  
9 should say "California PUC." It was a typo. California PUC  
10 means California Public Utilities Commission.

11           Q.    So with that correction, if I were to ask you those  
12 same questions today, would your answers be the same?

13           A.    Yes.

14           Q.    I would -- let me do -- let's cover Exhibit 3. Do you  
15 have that in your hand?

16           A.    Yes.

17           Q.    Could you tell us what that is?

18           A.    Exhibit 3 is my surrebuttal testimony.

19           Q.    Do you have any additions or corrections to that?

20           A.    No.

21           Q.    So if I were to ask you the same questions that are  
22 asked in that exhibit, would your answers be the same?

23           A.    Yes.

24           MS. CREMER: Staff would offer Exhibits 2 with  
25 attachments A and B, and Exhibit 3.

1 MR. SMITH: Is there objection from other parties?

2 MR. GLASER: No objection.

3 MS. STUEVE: No objection.

4 MR. O'NEILL: No objection.

5 MR. SMITH: Staff's Exhibits 2, including sub exhibits  
6 A and B, and 3 are received into evidence.

7 EXHIBITS:

8 (Staff Exhibit Nos. 2, 2-A, 2-B and 3 received into  
9 evidence.)

10 Q. (BY MS. CREMER) Thank you. Dr. Denney, would you  
11 summarize your prefiled and surrebuttal testimony for us?

12 A. Yes. The purpose of my testimony was to evaluate the  
13 application in the context of South Dakota facilities siting  
14 rules, specifically the rules contained in the sections of the  
15 codified law and administrative rules. The relevant chapter of  
16 the codified law lists two groups of criteria for evaluation of  
17 the application. The first group is technical grounds on which  
18 the application can be denied. They include deliberate  
19 misstatements and failure to file application in the required  
20 format and content.

21 The second group of criteria requirements are  
22 concerning the impact of the facility, that the facility will  
23 comply with all the applicable laws and rules, whether the  
24 facility will pose a threat of serious injury to the  
25 environment, socioeconomic conditions, health, safety and

1 welfare of the inhabitants and whether the facility will  
2 interfere with the orderly development of the region.

3           Regarding the first group of the requirements, the  
4 technical grounds on which the application can be denied, my  
5 analysis showed that the applicants generally met these  
6 conditions. Regarding the second group of compliance with the  
7 rules, not a threat of serious injury to the environment or  
8 welfare of the inhabitants and orderly development with the  
9 region, I found that the applicants intend to comply with all  
10 the applicable rules and that the facility will bring positive  
11 economic impacts to the state of South Dakota.

12           The remaining criterion from the second group, the  
13 environmental impacts is the main negative effect of the  
14 facility, specifically its air emissions. Though Big Stone II  
15 will cause an increase in the emissions of a number of  
16 pollutants, it will not violate the existing federal or state  
17 standards concerning pollution. And note that these standards  
18 are set in order to avoid serious injury to public health and  
19 welfare.

20           However, Big Stone II will emit significant amounts of  
21 carbon dioxide, which is currently not regulated by federal or  
22 state laws and carbon dioxide is known to be associated with  
23 global warming. In order to help the commission understand the  
24 magnitude of adverse effects from the project's air emissions,  
25 I conducted a cost benefit analysis. I calculated the

1 environmental effects in monetary terms and compared them to  
2 the positive economic effects that were already quantified by  
3 the applicants.

4         The main challenge to such cost benefit analysis of  
5 course is to choose appropriate, meaning objective and  
6 impartial monetary values for the damages associated with unit  
7 pollutions, damages that often are referred to as externality  
8 values. I adopted the externality values from a survey of  
9 academic literature conducted by the EPA, the U.S.  
10 Environmental Protection Agency. The key feature of these  
11 externality values is that they are expressed as a range rather  
12 than point estimates, and expressing them as a range is a more  
13 reasonable approach than point estimates because it just  
14 reflects the significant degree of uncertainty associated with  
15 monetizing these damages.

16         For example, the EPA survey reports that their widest  
17 range is associated with carbon dioxide emissions and the  
18 values are between \$1.50 and \$51 per ton of carbon dioxide  
19 emissions. And this result is not surprising that the widest  
20 ranges is associated with carbon dioxide rather than other  
21 pollutants because it is much harder to predict and estimate in  
22 dollar terms the future effects of the global warming compared  
23 to, say, the effects of other pollutants where we can actually  
24 like today observe the negative effects, which are typically  
25 health effects to people, effects to the property.

1           My cost benefit analysis showed that the net effect of  
2 the Big Stone II project, the difference between the positive  
3 economic impact and the negative environmental impacts lies  
4 within the wide range between negative net loss and positive  
5 net gain values. The net losses occur if we adopt the carbon  
6 dioxide values from a proportion of the EPA range. In other  
7 words, this cost benefit analysis does not provide conclusive  
8 evidence on whether the net effect of the project will be  
9 positive or negative and this inconclusive result is driven  
10 mainly by the uncertainty associated with trying to attach  
11 dollar values to the carbon dioxide emissions.

12           As I explained in my testimony, the research on the  
13 monetary impacts of the carbon dioxide externalities is still  
14 in its early stage and the main difficulty is our incomplete  
15 information about this process and the specifics of global  
16 warming. Because of this uncertainty and incomplete knowledge,  
17 I recommend the commission should be more conservative if it  
18 decides to consider the externality approach in evaluation of  
19 this application and decision making. And when I say more  
20 conservative, I mean using the externality values from the  
21 lower portion of the EPA, from the range reported in the EPA  
22 survey.

23           One example of a value that would fall in the lower  
24 portion of the EPA survey would be the values adopted by the  
25 Minnesota PUC that were mentioned previously in this hearing,

1 which is, it's a range up to \$3.64. So if we use that value in  
2 my analysis, the net benefits of the project are positive.

3 Therefore, based on my review of the application, the  
4 benefits derived from the Big Stone project and the reasonable  
5 assumptions about the carbon dioxide emissions, I recommend  
6 that this commission approves the application, and that  
7 concludes my summary. Thank you.

8 Q. So based on that, do you have any conditions -- excuse  
9 me. Do you have any other conditions that you would place? If  
10 the commission were to approve this permit, are there any other  
11 conditions they should place on that, in your opinion?

12 A. Yes. First I recommended the application be approved  
13 conditional or subject to the condition that all applicable  
14 permits are issued. Second, I mentioned in my direct testimony  
15 that I support the recommendations made by the local review  
16 committee and the draft Environmental Impact Statement. Third,  
17 I recommend that the applicants submit implementation plan  
18 to -- a plan to implement the recommendations of the local  
19 review committee, to which they agreed. And third, and this is  
20 a new recommendation that is not in my testimony, I recommend  
21 that in the event the commission approves the application, the  
22 applicants submit to the commission periodic updates on the  
23 course of the project and that they should start from the date  
24 when the application is approved and until the plant is full  
25 operational and past the testing stage.

1           And these periodic updates should have information on  
2 the course of the construction, the status of land acquisition,  
3 the environmental activities, the status of their permits and  
4 any significant changes to the design of the project that have  
5 been made. This last recommendation was modeled after the  
6 recommendation made in the Wisconsin, case of the Wisconsin  
7 Public Service Commission regarding the application of a coal  
8 plant called Westin IV unit and it has been mentioned before.  
9 And I believe my counsel is going to or has distributed that, a  
10 copy of that final decision with the exact wording that we were  
11 looking at to the parties and the commission.

12           MS. CREMER: I did not give it to the commission, I  
13 did give it to the parties. It was just -- I can give that to  
14 the commission. It's found in the Westin IV order and the  
15 company has agreed to provide that periodic update and it was  
16 just kind of what staff was looking at. Thank you, Dr. Denney,  
17 that is all the staff has.

18           MR. SMITH: Applicants, do you have cross-examination  
19 of Ms. Denney?

20           MR. GLASER: Yes, we do.

21                                   CROSS-EXAMINATION

22 BY MR. GLASER:

23           Q. Dr. Denney, let me just start by saying that we  
24 appreciate what I personally consider to be a very cogent  
25 summary of your analysis. I found it to be very well-reasoned

1 and we particularly appreciated the last part. As I understand  
2 it, your view was that staff in fact does recommend issuance of  
3 the permit to the applicants; is that correct?

4 A. Yes.

5 Q. And --

6 A. Based on the information that we heard up to this  
7 point.

8 Q. Fair enough. And you mentioned some conditions. To  
9 your knowledge, have the applicants agreed to those conditions?  
10 I guess I should put in an exception to the one you mentioned  
11 at the end that you were just forwarding or putting forth  
12 today, but aside from that one, to your knowledge, have the  
13 applicants agreed to these conditions?

14 A. I believe they agreed to the conditions regarding the  
15 recommendations of the local review committee and the draft  
16 EIS. I'm not sure whether they reviewed the conditional issues  
17 of the application conditioned on the fact that all the permits  
18 are issued.

19 Q. We can cover that elsewhere, that's fine. Let me just  
20 ask you just a couple of questions initially about your  
21 background here. Just looking at I guess it's 2-A, which is  
22 your resume, in the context of a regulatory proceeding, have  
23 you previously analyzed the proposed operation of a coal-fired  
24 power plant prior to this case?

25 A. No.



1 Q. And it just appears just looking through the resume  
2 there, that your regulatory commission work appears to be  
3 primarily telecommunications work; is that a correct  
4 assessment?

5 A. Yes.

6 Q. Well, let me ask you about the externality issue which  
7 you talked about in your summary and particularly the issue of  
8 I guess what we are calling monetized externality values. And  
9 let's start with table three on page 25 of your first round of  
10 testimony, which is Exhibit 2. Do you have that in front of  
11 you now?

12 A. Yes, I do.

13 Q. That table is entitled Big Stone II annual emissions  
14 and externality values used to calculate Big Stone II's  
15 environmental impact. Let's just explore the concepts here.  
16 Let's look at the line marked CO, which is carbon monoxide, and  
17 there is a low value of \$700 and a high value of \$2900 in 1999  
18 dollars. So if I'm reading this chart correctly, what this  
19 tells us is that for each ton of carbon monoxide emitted by Big  
20 Stone II, there is a cost created in terms of an environmental  
21 impact which is valued in dollar terms or monetized in a range  
22 of \$700 per ton to \$2900 per ton in 1999 dollars; is that  
23 accurate?

24 A. Yes.

25 Q. Okay. And that would be obviously the same for the

1 other values that are mentioned here, PM 10, VOC, lead, et  
2 cetera, correct?

3 A. Yes.

4 Q. Then if we could just turn to page 33, table four of  
5 the same testimony.

6 A. I'm there.

7 Q. And that is entitled Big Stone II annual environmental  
8 impact estimates. And so looking again at the line for CO or  
9 carbon monoxide, we have again a low, a high and also an  
10 average. And am I correct in reading this that if we take the  
11 dollar per ton figure that you just gave us for CO2  
12 environmental impacts and multiply it by the amount or the tons  
13 of emissions from Big Stone II of carbon monoxide, the result  
14 would be the numbers that we see here on this table, the 2.56  
15 million to 10.60 million?

16 A. Yes, with a small nuance. I am also converting 1999  
17 dollars to 2005 dollars.

18 Q. But the point here is that what this table is  
19 depicting is that on an annual basis, Big Stone II will create  
20 a dollar impact, an environmental damage measured in dollars  
21 here for carbon monoxide of 2.5 to \$10 million a year.

22 A. Yes.

23 Q. And you say -- let's just go back to page 22 of the  
24 same exhibit. Looking at the question asked on line four, and  
25 the question is, did the applicants calculate the environmental

1 effects to assess demonstrated or suspected hazards to human  
2 plant and animal communities as required by ARSD 20:10:22:13,  
3 and your answer is no, they did not. And reading down to the  
4 bottom on line 18, you say, therefore, staff performed its own  
5 calculation of the environmental effects; do you see that?

6 A. Yes.

7 Q. And I think you know where I'm going with this. There  
8 was some testimony from Mr. Hewson and testimony to which you  
9 responded to about whether or not there's a threshold question  
10 here about whether or not this statute -- I'm sorry, the  
11 regulation, when it says calculate environmental effects,  
12 whether that statute contemplates that those environmental  
13 effects will be rendered into monetized externality values in  
14 dollar per ton; is that correct? Is there that threshold  
15 question here?

16 A. I didn't hear your last -- I didn't understand your  
17 comment with the threshold. Can you simplify the question?

18 Q. Yeah. You testify in your second round of testimony,  
19 to save time, I won't make you go there, that you agree with  
20 Mr. Hewson, that you would leave it to the commission to read  
21 this regulation and determine in fact whether or not doing a  
22 monetized calculation of environmental impacts is something  
23 that this regulation requires; do you recall that?

24 A. Yes.

25 Q. And so my only question here is so you recognize that

1 the commission here has to make its own decision in terms of  
2 what this regulation says and whether this monetized approach  
3 is really the way to go in terms of interpreting this  
4 regulation; is that correct?

5 A. Yes, definitely, it's up to the commission to decide,  
6 but I think even if this is not a requirement, I still believe  
7 my analysis provides a useful insight as an economist because,  
8 for example, the statute, the codified law says that there  
9 should be no serious threat of injury and for me as an  
10 economist, the word serious is not defined well, so economists  
11 do measure everything in dollars and you in a sense have to pay  
12 for everything, so if your benefits are more than your cost,  
13 then the purchase is justified and that's the approach I'm  
14 taking here.

15 Q. Right, and I think at some point in your testimony you  
16 call it a useful tool; do you recall that?

17 A. Something of that, yes.

18 Q. Sure, because you have -- we have environmental  
19 effects on one side, we have economic benefits on the other  
20 side. It's easy to put a dollar figure on the economic  
21 benefits and using monetized values, you can compare apples to  
22 apples as it were; is that right?

23 A. Yes.

24 Q. But do you know, and maybe you know this because I  
25 honestly don't know the answer to this question, has this

1 commission in the past utilized monetized externality values  
2 for any purpose, do you know?

3 MS. CREMER: I would only interject that, if you know  
4 the answer. This is the first time we have ever hired her as a  
5 consultant, so I doubt she has the history of the commission.

6 MR. GLASER: That's fine.

7 A. Yes, that would be my answer, I do not know.

8 Q. (BY MR. GLASER) I have read through all of the  
9 testimony here with interest to try to figure out how many  
10 states in fact do use a monetized approach when evaluating  
11 environmental impacts, and I didn't see in your testimony a  
12 list of states that do this. Do you have a list of states in  
13 mind that when they are required to look at environmental  
14 facts, environmental effects, in fact try to put a dollar per  
15 ton value on those effects?

16 A. I know some states, but I did not make a survey  
17 because I think it's really beyond my point. I'm not trying to  
18 offer or start a rule making proceeding, I'm just trying to use  
19 a tool and really what prompted me to do this is the economic  
20 analysis, the multiplier analysis that the applicants  
21 conducted, so when you see they conducted -- you conducted --  
22 estimated the economic impacts, that was also not part of the  
23 requirements, it seemed logical to try to estimate the costs in  
24 a similar fashion.

25 Q. Sure. I guess my only question is are you familiar

1 with whether or not your recommendation to use monetized  
2 externality values gets into an issue that has been considered  
3 by other states about whether to use monetized externality  
4 values and whether you know the results of any of those  
5 potential -- any of those deliberations?

6 A. I disagree with that characterization of my testimony  
7 because I do not recommend to use externalities. Just because  
8 I used this approach just like I used an Excel file doesn't  
9 mean I endorse it for the commission to use Excel software or  
10 externalities as a tool everywhere. I'm just trying to provide  
11 useful evidence.

12 Q. That's fair enough. But let me just button this down.  
13 I don't want to go on too much on this. Are you familiar that  
14 in fact North Dakota forbids its commission from using  
15 environmental externality values in resource planning?

16 A. I'm familiar based on hearsay, which is the testimony  
17 of one of the applicants.

18 Q. Well, I think it would be worthwhile at this point,  
19 then, to in fact pull out the statute.

20 MS. CREMER: I'm not real sure of what the relevance  
21 of North Dakota not allowing this, as our jurisdiction ends at  
22 the border. Why do I care?

23 MR. GLASER: Well, you care because there is a  
24 recommendation here or at least an approach that to use  
25 monetized externality values, I think it's relevant for the

1 commission to understand that other states have looked at doing  
2 the same and have decided not to do so.

3 MS. CREMER: So I guess -- but my objection I guess  
4 would lie solely to relevance.

5 MR. SMITH: Yeah, I think -- can I just ask a question  
6 of you, Mr. Glaser?

7 MR. GLASER: Certainly.

8 MR. SMITH: Is that for Ms. Denney here to answer I  
9 guess would be my question? Or is that something that we argue  
10 about in oral argument and/or briefing as to which policy,  
11 given what I've heard here today, and I wasn't aware that our  
12 legislature's pronouncements via legislative resolutions on  
13 global warming plus North Dakota plus some other things, are  
14 those strictly -- are you asking her for her advice vis-a-vis  
15 policy, I guess?

16 MR. GLASER: Oh, Mr. Smith, I'm perfectly willing to  
17 move on at this point. The only point I was trying to make  
18 here is that this issue of monetized externalities is something  
19 that other states have looked at. Mr. Hewson testified that  
20 there was only a very small minority of states that want to  
21 wade into this and I was trying to test the witness's knowledge  
22 of that background. That's fine.

23 Q. (BY MR. GLASER) Let's then go back to page 33, if we  
24 could.

25 A. I'm there.

1 Q. And again on table three, we see mercury externality  
2 estimates per ton of emissions. Do you see that?

3 MS. CREMER: Do you mean table three or four? You  
4 said table three on page 33.

5 MR. GLASER: Yeah, let's go to table three, excuse me,  
6 on page 25. Thank you for the correction.

7 A. I'm there.

8 Q. (BY MR. GLASER) And one of the externality values  
9 that we have depicted on this table is for mercury; do you see  
10 that?

11 A. Yes, I do.

12 Q. And I take it from reading the testimony, that if in  
13 fact Big Stone II does not result in a net increase in  
14 emissions as compared with current operations at Big Stone I,  
15 you would agree with me that there would be no mercury  
16 externality value in this case.

17 A. Only partially. There are two factors here. First,  
18 from reading your rebuttal, surrebuttal testimony, the very  
19 last round, I understood that you did not come into the cap  
20 during the first three years of operation, so there may be  
21 emissions higher than the existing levels and the way you  
22 explain it is you need time to test the new control technology.

23 Second, I recall that there is now a new rule that  
24 requires the state of South Dakota to reduce the mercury  
25 emissions, meaning that Big Stone plant I and II will have to



1 reduce its mercury emissions even further. So assuming that  
2 this project does not go through, Big Stone II, Big Stone I  
3 would likely have to reduce emissions. And the applicants  
4 testified, I think it was Mr. Graumann, that there is this  
5 certain uncertainty about this new mercury emission control  
6 technologies. So my point is that the more you start with a  
7 certain level of mercury that you need to remove and that  
8 mercury depends on the amount of coal that you are processing,  
9 so the fact that you have a Big Stone II means that you have  
10 more coal, more mercury to remove. So there is this -- there  
11 is I guess a more complex causality relationship, that if you  
12 do not build Big Stone II, it is possible that you might be  
13 able to reduce emissions of the existing Big Stone unit to a  
14 lower level more successfully.

15 Q. Well, let's break down the two thoughts. So the first  
16 point is there could be a three-year window where there could  
17 be an increase in mercury emissions; is that right?

18 A. Yes.

19 Q. And then we know that there's going to be a mercury  
20 budget for South Dakota; is that right?

21 A. Yes.

22 Q. Okay, and so that budget is going to apply, in other  
23 words, South Dakota will be assigned a mercury budget, whether  
24 or not Big Stone II is ever built.

25 A. Correct.

1 Q. So if Big Stone II is built, then South Dakota  
2 nevertheless has to comply with that budget.

3 A. Yes.

4 Q. If Big Stone II is not built, South Dakota still has  
5 to comply with that budget.

6 A. Yes, or when I was saying yes, or buy more allowances.

7 Q. Or buy more allowances. Buying more allowances, we  
8 wouldn't call that an externality, that would be an actual cost  
9 experienced by Big Stone II they would have to meet, correct?

10 A. Correct.

11 Q. Do you know whether or not that cost has been  
12 considered by the Big Stone II applicants in their economic  
13 models?

14 A. I believe it was considered, but it's somewhat not  
15 related to this issue.

16 Q. Let's look at in particular the values for carbon  
17 monoxide, CO, and PM 10, particulate matter. Both carbon  
18 monoxide and PM 10, we would call those criteria air  
19 pollutants; you are familiar with that term?

20 A. Yes.

21 Q. And criteria pollutants are regulated under, we have  
22 had some testimony about this, the NAAQS system, N-A-A-Q-S  
23 system; is that correct?

24 A. Yes.

25 Q. And that stands for the National Ambient Air Quality

1 Standards; is that right?

2 A. Yes.

3 Q. And I think it would be helpful to spend a few minutes  
4 exploring this system so the record is clear on this. Under  
5 the NAAQS system -- well, to start, the NAAQS system is a  
6 system that is legislated under the federal Clean Air Act; is  
7 that right?

8 A. It is my understanding.

9 Q. And so under the NAAQS system, the way this works is  
10 that EPA sets air quality standards for certain air pollutants  
11 which we call the criteria pollutants; is that right?

12 A. Yes, that is my understanding.

13 Q. And these NAAQS, these ambient air quality standards,  
14 are designed to protect public health with an adequate margin  
15 of safety and with no consideration given to the cost of  
16 complying with these air quality standards; is that your  
17 understanding?

18 A. Yes.

19 Q. And the NAAQS are set based on a process that involves  
20 public rule making and comment; is that right?

21 A. That is my understanding, but you are going slightly  
22 beyond my expertise here.

23 Q. Do you know that in establishing these air quality  
24 standards that EPA receives the input of something called the  
25 Clean Air Science Advisory Committee comprised of scientists?

1           A.    No, I do not know about the names of participants in  
2 this process.

3           Q.    Okay.  But in any event, these air quality standards,  
4 what they do is they set levels for these criteria pollutants  
5 in the air below which the air is considered to be safe with a  
6 regional -- with a reasonable margin of safety, above which the  
7 air is considered to be unsafe; is that depicted okay?

8           MS. CREMER:  I'm just going to ask, you know, if this  
9 is something you guys want as testimony, maybe you should call  
10 a witness.  This really isn't her area of expertise and so you  
11 appear to be doing the testifying and just getting her to  
12 agree.  To an extent that's fine, but if this is something that  
13 you want as evidence, I believe you should put it in your case  
14 as opposed to mine.

15           MR. GLASER:  I think the witness knows where this is  
16 going.  The witness has testified that we have monetized  
17 externality values for criteria pollutants of carbon monoxide,  
18 particulate matter and lead.  That indicates that those  
19 pollutants, under the monetization, are causing health or  
20 welfare impacts and that's why she is saying that those  
21 pollutants should have monetized values and we add those to the  
22 one side of the equation of environmental impacts.  And I'm  
23 absolutely certain the witness knows where this is going in  
24 terms of in fact there are no such impacts under the system of  
25 air quality regulation that we have today.  I think this is

1 fair game.

2 MS. CREMER: Then I guess --

3 MR. SMITH: I'm going to overrule the objection.

4 Please proceed.

5 A. What was the question?

6 Q. (BY MR. GLASER) Let me think of another one. Do you  
7 know whether or not the NAAQS are required to be reviewed every  
8 five years?

9 A. No, I don't know about specific time periods.

10 Q. Do you know that based on the standards, states are  
11 required to determine areas of the state that are either in  
12 attainment with those standards and areas that are not in  
13 attainment with those standards?

14 A. I know that attainment and nonattainment areas are  
15 determined. I'm not sure who is required to do that.

16 Q. Okay. And so if an area of a state does not comply  
17 with these air quality values, then that area of the state is  
18 designated a nonattainment area, correct?

19 A. Yes.

20 Q. And are you aware whether or not an individual state,  
21 if it believes that the air quality standards are not stringent  
22 enough, whether that state can set more stringent standards on  
23 its own than EPA has set?

24 A. Yes, I'm aware of that.

25 Q. States can do that?

1           A.    Yes, they can do that.

2           Q.    Okay.  So in theory anyway, under this system, if, as  
3 the applicants have testified here, that carbon monoxide and PM  
4 10 emissions at Big Stone II do not cause any areas of South  
5 Dakota to be in nonattainment of the air quality standards for  
6 those substances, there should be no environmental impacts  
7 regarding those substances in South Dakota; is that correct?

8           A.    No, I do not agree with this position, and let me  
9 explain.  First, I did address it in my testimony and I  
10 provided a quotation from the order by the Minnesota PUC, that  
11 same order regarding the externality values that the applicants  
12 like to refer to, that also the order -- the Minnesota order  
13 said that there is no evidence that this National Air Ambient  
14 Quality Standards are set at levels that assume zero cost, and  
15 that's why they continue having nonzero positive externality  
16 values for these pollutants, though Minnesota is now in an  
17 attainment area for them.

18                    Second, there is a limited degree, I guess, of  
19 knowledge in the way the standards are updated.  It's not a  
20 continuous process from the new discovery to regulatory  
21 approval.  And third, if you look at the standards, they are  
22 set as averages for -- some of them are annual, others are  
23 24-hour and an average means that the actual levels of  
24 concentration of pollutants may be higher or lower within that  
25 interval.  The standard may still be met though there was a

1 time period where the concentration was higher than was  
2 considered to be a standard. And because many of these  
3 pollutants are causing health effects such as all kinds of  
4 asthma attacks and so on, which have almost instantaneous  
5 effect as far as I understand, if the air quality is low, a  
6 person with this sensitive respiratory system will suffer from  
7 that. So just because an average in a year, a standard is met,  
8 doesn't mean that a specific person will not still have adverse  
9 effects.

10 Q. Okay. Well, if I could, let me just break down some  
11 of that answer there. If you could look at your second round  
12 of testimony, Exhibit 3 on page 13, and you mentioned in the  
13 answer that you just gave that you thought that Minnesota,  
14 Minnesota, for instance, the commission had determined that  
15 there might still be health effects occurring even if the NAAQS  
16 are being met, correct?

17 A. Yes.

18 Q. And you are referring to this indented paragraph here  
19 on page 13; do you see that?

20 A. Yes.

21 Q. And according to the Minnesota PUC, it says,  
22 however -- and this is -- what you are quoting from here I take  
23 it, footnote 27, this is their order as of 1997?

24 A. Yes.

25 Q. According to the Minnesota Public Utilities

1 Commission, EPA has not been able to keep the NAAQS updated,  
2 they do not reflect the latest scientific knowledge, and then  
3 it says, based on the record established in this matter, it is  
4 clear that the NAAQS currently are not necessarily set at no-  
5 cost levels. I guess the difficulty I'm having with the  
6 response that you gave is whether there is a record here in  
7 this case that there are in fact health effects occurring in  
8 South Dakota because of the view that the NAAQS are not set at  
9 an appropriate level, that EPA is not doing its job, it's not  
10 keeping up with the science. I don't see that record here.  
11 Does that record exist?

12 A. Your question had several parts, so I cannot answer  
13 yes or no. It had too many to follow.

14 Q. Have you presented in your testimony any analysis of  
15 health effects actually occurring in the state of South Dakota  
16 because the NAAQS are not sufficiently protective of human  
17 health the way they are designed to be?

18 A. No, I did not present this analysis because clearly  
19 I'm not an expert. But I did note in my first, in my direct  
20 testimony that my calculations of the environmental impact are  
21 pessimistic, meaning they are maybe overstating the results,  
22 overstating the impacts, and in my rebuttal testimony, I also  
23 noted that, again, that this is -- I am just taking the most  
24 straightforward approach. I do agree that if you have an  
25 attainment area, that the effects of the air pollutant are



1 likely to be lower than when you look at nonattainment area,  
2 but that in -- the bottom line here is that these numerical  
3 analysis regarding the criteria pollutants, pollutants for  
4 which there is a standard, does not really affect the net  
5 outcome of my analysis. I am conducting kind of a pessimistic  
6 path scenario, which is in essence not favoring the applicants,  
7 but I'm showing that even under this scenario, I still believe  
8 that there are positive impacts.

9 Q. And I appreciate that, and believe me, I understand  
10 that a lot of people, you know, criticize EPA and don't think  
11 that EPA is doing its job correctly. But let me just close the  
12 loop on this and then I can move on. Just two follow-up  
13 questions just to make sure things are clear. You mentioned,  
14 you know, that the NAAQS are set on averages, for instance,  
15 annual and there could be effects occurring on some other  
16 basis. But do you know that in fact that EPA does have  
17 authority to set NAAQS on, for instance, daily ambient  
18 concentrations of pollutants in the air and in fact has done  
19 that?

20 A. I do not know whether they have the authority, but one  
21 of the previous applicants, your witnesses today testified, as  
22 far as I understand, that there is some difficulty measuring  
23 some of this pollutants, I think it was particulate matter, so  
24 I imagine the standards are set at the more -- not on a daily  
25 basis but, say, on an annual basis because of that difficulty

1 of monitoring, so there is this regulatory cost of monitoring  
2 things.

3 Q. But if I were to ask you whether you know whether or  
4 not EPA's current standards for particulates are both set on  
5 there's a separate standard for an annual -- there's both a  
6 separate annual standard and a separate 24-hour standard, would  
7 you know that?

8 A. I actually have a table, I thought you may ask. And  
9 it depends on the pollutant. Some of them are set only on an  
10 annual basis, I believe, let me look at it. For example,  
11 nitrogen dioxide is only -- listed only as annual. Lead is  
12 listed only as quarterly average. Carbon monoxide is listed  
13 only as eight hour and one hour, so it depends.

14 Q. Right. But EPA in fact could set a daily standard if  
15 it wanted to, if it felt that -- if there was a health effect  
16 being experienced on a daily basis, that's the only thing I'm  
17 trying to tie down here.

18 MS. CREMER: So are you asking that does she know that  
19 or you are asking her to speculate could they do that?

20 MR. GLASER: Just whether she knows. I'm really not  
21 trying to have an argument here, I'm just trying to understand  
22 how the air quality regulatory system in the country in South  
23 Dakota works.

24 A. My answer is I do not know because I don't know  
25 whether there are some technical difficulties or economic

1 difficulties in monitoring and enforcing that more frequent  
2 standard.

3 Q. (BY MR. GLASER) But in any event, I think as you told  
4 me, if it were felt in South Dakota that the EPA standards in  
5 fact were not protecting the health, South Dakota, the DENR  
6 could step in and issue more stringent regulations; that's  
7 correct, isn't it?

8 MS. CREMER: I'm not sure that's a correct statement  
9 of South Dakota law, that they can set a more stringent  
10 measure.

11 MR. GLASER: Okay, that's fair.

12 Q. (BY MR. GLASER) Your testimony referred to the  
13 possibility that there could be long-range transport of certain  
14 pollutants; do you recall that?

15 A. Yes.

16 Q. And in your surrebuttal testimony, you refer to, you  
17 single out particulate matter as pollutants that could  
18 transport long range.

19 A. Yes, that information was based on what I read on the  
20 EPA Web site.

21 Q. And the relevance of this to this case is that even if  
22 the NAAQS are being met in South Dakota, in fact there could be  
23 transport of these pollutants outside of South Dakota, causing  
24 an effect outside of South Dakota; is that right?

25 A. Yes.

1 Q. What about carbon monoxide, did you have any  
2 information about whether that was one of the pollutants that  
3 could be transported out of state?

4 A. I believe it is typically not transported long  
5 distances. I don't know about middle distances. I did not  
6 rebutt that part of Mr. Hewson's testimony.

7 Q. And then on particulate matter, that was the one that  
8 you mentioned. And you referred to PM 10 and PM 10, as I  
9 understand it, is particulate matter that has an aerodynamic  
10 diameter of less than 10 microns; is that right?

11 A. Yes.

12 Q. And within the PM 10 category, there's also something  
13 called PM fine or PM 2.5; you are aware of that?

14 A. Yes.

15 Q. And then particulate matter that is larger than PM 2.5  
16 but less than PM 10 is sometimes called coarse particulate  
17 matter; is that right?

18 A. I do not know that terminology.

19 Q. Okay. Do you know whether or not it is, when EPA  
20 refers to particulate matter that is transported hundreds or  
21 thousands of miles, whether they are referring to fine  
22 particulate matter, coarse particulate matter?

23 A. They are referring to fine particulate matter.

24 Q. Are you familiar with something called the Clean Air  
25 Interstate Rule or CAIR rule recently promulgated by the

1 Environmental Protection Agency?

2 A. I know that that rule -- I know about the existence of  
3 this rule. I cannot speak intelligently on the specifics of  
4 this rule.

5 Q. But just in general the purpose of that rule is to  
6 address long-range transport of fine particulate matter that  
7 results from emissions of sulphur dioxide and nitrogen oxide  
8 from electric utilities; is that right?

9 A. I cannot answer this question because you are going  
10 further than my knowledge.

11 Q. Okay, do you know, just being generally aware of the  
12 CAIR rule, do you know whether or not the rule applies to the  
13 whole country?

14 A. No, I believe it does not apply to South Dakota.

15 Q. Okay. That's fine. Let's move on, then, to what I  
16 think will be my last topic, and that is the CO2 externality  
17 values and if we could just go back to your table three, again  
18 on page 25.

19 A. I'm there.

20 Q. And you refer there to, and you testified about this  
21 earlier, to two possible ways that you looked at at monetizing  
22 a CO2 value. One was a literature survey and the other is the  
23 California PUC adder. Do you see that?

24 A. Yes, I do.

25 Q. And the literature survey is something that you

1 described as an EPA literature survey.

2 A. Yes, it's a survey made by the EPA and published on  
3 their Web site.

4 Q. Do you have that Web site material with you?

5 A. I'm hesitant to answer because I have a link, it's in  
6 my Exhibit B. I don't have the Web site with me.

7 Q. Without trying to unduly prolong these proceedings,  
8 I'd like to show you the document, we can just talk about that.

9 A. Okay.

10 Q. We are actually going to hand out two documents at the  
11 same time to save time. Perhaps we won't need the second  
12 document, but I just want to explore the first document.

13 MS. CREMER: Are you intending to offer these?

14 MR. GLASER: Well, I will be offering the first  
15 document.

16 MS. CREMER: The first one to you is which one?

17 MR. GLASER: The first document is entitled Marginal  
18 Damage Estimates For Air Pollutants and if we never get to the  
19 second document, then we can just throw that document away.

20 Q. (BY MR. GLASER) The document --

21 EXHIBITS:

22 (Applicants' Exhibit No. 117 marked for  
23 identification.)

24 Q. (BY MR. GLASER) And my question on Exhibit 116, is  
25 this the document that you are referring to, the literature

1 survey from EPA?

2 A. Yes.

3 MR. SMITH: Excuse me, did we not label that 117?

4 MR. GLASER: 117; I'm sorry, 117.

5 MR. WELK: We reserved 116.

6 MR. SMITH: Sorry to interrupt.

7 MR. GLASER: Thank you.

8 Q. (BY MR. GLASER) And it says on the first page there  
9 at the top, it says source, Federal Purchasing Categories  
10 Ranked by Upstream Environmental Burden; do you see that? It's  
11 an October 1998 analysis performed under contract to the Office  
12 of Pollution Prevention and Toxics, U.S. EPA.

13 A. Yes, I do see that.

14 Q. So this document that we are looking at and on which  
15 you cited in your testimony, is your understanding that it was  
16 written by this firm in 1998 under a contract to EPA?

17 A. I mean, this is the source that's listed, yes, that is  
18 my understanding. But it seems to be it has been approved by  
19 the EPA in a sense. That's why I'm referring to it as the EPA  
20 survey.

21 Q. Yeah, that is actually what I was going to ask you,  
22 because I actually spent some time trying to figure out what  
23 purpose this document, for what purpose this document is used  
24 by EPA and I'm not sure that I did figure that out and I'm  
25 wondering if you know that, this document was written in 1998,

1 it is, you are right, it's still on their Web site, but I  
2 wonder if you could just give us some background on how this  
3 document is used by EPA.

4 A. I cannot give you this background. I don't work for  
5 the EPA.

6 Q. Well, let's just quickly turn over to -- I didn't get  
7 page numbers on mine, but it the fourth page. I see a table  
8 down towards the bottom, table 3-2, damage values for carbon  
9 dioxide emissions, 1996 dollars per ton, and I see the 1.5 to  
10 51. That's where you got the numbers that you included in your  
11 analysis?

12 A. Yes.

13 Q. And then again, the source that is listed for this  
14 table for the \$1.5 to \$51 indicates that it's Leach '97, then  
15 it gives a cite, it's an article entitled "A systems approach  
16 to material flows in sustainable cities: A case study of  
17 paper." I'm wondering if you ever -- obviously I have handed  
18 out what I think is the Leach paper in any event, but I'm  
19 wondering if you went back as far as the Leach paper to see how  
20 that analysis was done of how they came up with a one dollar to  
21 \$51 a ton.

22 A. No, I didn't go there because being outside academics  
23 now it's really hard to get ahold of academic publications.

24 Q. Right. Well, and speaking of which, even on this  
25 document 117, it says that Leach in turn adopted data from a



1 literature review by Hormandinger in 1995 entitled "Fuel cells  
2 in technology and medicine." We couldn't find that one and I  
3 guess I ought to close the loop here and find out whether you  
4 found that one yourself.

5 A. No.

6 MR. GLASER: The Leach paper that I've handed out,  
7 let's go ahead and mark this.

8 EXHIBITS:

9 (Applicants' Exhibit No. 118 marked for  
10 identification.)

11 Q. (BY MR. GLASER) Okay, the Leach paper, Exhibit 118,  
12 on page 711 I see the chart, figure four, and it's got CO2  
13 externality values and that indicates that the source for those  
14 values is the Hormandinger paper and in fact going over to page  
15 720 in the back, there's an actual citation for Hormandinger.  
16 Do you see that on page 720?

17 A. Just a moment.

18 Q. Yeah, please, I don't mean to rush you through this,  
19 take your time.

20 A. Yes, I do see that.

21 Q. And so the citation of Hormandinger indicates that it  
22 is an unpublished master's thesis from the University of  
23 London. Do you see that? So you haven't actually reviewed  
24 obviously the Hormandinger paper, I think I asked you that; is  
25 that right?

1           A.    No, I haven't reviewed it.  Yes, you have asked me  
2 that.

3           Q.    Thank you for both answers.  I'm getting a little  
4 older now and have some problems remembering.  So I guess if I  
5 asked you, you know, how this \$1 to \$51 number, this CO2 number  
6 was developed, what the assumptions were, what the background  
7 was, what they looked at, how that all came about, you would  
8 not be able to answer that; is that right?

9           A.    Well, I will not be able to answer that, but just note  
10 that just because it is a master's thesis, the paper says here  
11 that Mr. Hormandinger conducted a survey of literature and that  
12 assumes that literature was most likely published and it was  
13 more than one source.  So it doesn't matter that that was in a  
14 master's thesis that wasn't published because he did a survey  
15 of literature, which is probably not a publishable paper, but  
16 it does not undermine its value in a sense.

17          Q.    Right.  I understand that.  It's a very wide range,  
18 the \$51 number obviously produces a very large dollar  
19 externality value, even looking at the midpoint of the range of  
20 one to 51 produces a very large dollar value in this case and  
21 I'd like to ask some questions about what the basis of that  
22 range is, how it was developed, assumptions, et cetera, but we  
23 don't have that on the record; is that right?

24          A.    Yes.

25               MR. GLASER:  That's all the questions I have and with

1 that, I would like to move admission of 117 and 118.

2 MR. SMITH: Is there objection?

3 MS. CREMER: Relevance, but I'm willing to go -- you  
4 can put it in.

5 MR. SMITH: Applicants 117 and 118 are received.

6 EXHIBITS:

7 (Applicants' Exhibit Nos. 117 and 118 received into  
8 evidence.)

9 MR. SMITH: Does that conclude applicants'  
10 cross-examination?

11 MR. GLASER: Yes, it does.

12 MR. SMITH: Then can I ask everybody if they want to  
13 plow ahead or do people need a short break?

14 MR. O'NEILL: I'll be short.

15 MR. SMITH: Why don't you go ahead, joint intervenors.

16 CROSS-EXAMINATION

17 BY MR. O'NEILL:

18 Q. Good afternoon, Dr. Denney.

19 A. Good afternoon.

20 Q. Dr. Denney, in talking about your background, could  
21 you just provide us a little bit of the regulatory utility  
22 related experience that you have and what review you did and  
23 what state proceedings you looked at?

24 A. As I explained before, this is my first  
25 nontelecommunications case. I filed testimony in a case with

1 the Michigan Public Service Commission, which was a union  
2 unbundled network elements case, which was related to shared  
3 and common cost of SBC, the local telephone company there. But  
4 as working for QSI Consulting, I also support witnesses and I  
5 actually keep track of the cases because there has been so many  
6 and I have counted approximately 20 cases, and when I say  
7 support witnesses, I do the analysis, I draft testimony, I go  
8 to hearings, I help with the cross.

9 Q. And in those 20 proceedings, some of them related to  
10 the electric utility regulation area?

11 A. No, except for this one.

12 Q. Okay. But for this proceeding, you reviewed other  
13 electric utility testimony and analysis?

14 A. Can you please clarify what you mean by other electric  
15 utility testimonies?

16 Q. That's as good as I can get for you. In your review,  
17 did you look at testimony or any presentations on electric  
18 utility related issues that were before public utility  
19 commission bodies?

20 A. Yes, I did some review and probably the most relevant  
21 was the Westin IV case in Wisconsin.

22 Q. Okay. Can you tell me -- we have heard other  
23 witnesses testify regarding this, what an externality cost is.

24 A. An externality cost is costs that are not borne by the  
25 person or entity that causes the cost.

1 Q. And how about a regulatory cost?

2 A. A regulatory cost in the context of this case, because  
3 there is no such official definition I guess in economic  
4 textbooks, is the cost that the producer, like the applicants,  
5 would actually bear because of the regulation imposed on them.

6 Q. Okay. And what I understand you did in this case was  
7 analyze the economic benefits versus the environmental  
8 regulatory costs that arose in this case; is that true?

9 A. No, this is not true. I did not look at the  
10 regulatory cost.

11 Q. I'm sorry, could you state that, your answer again,  
12 what you did?

13 A. You asked me whether I looked at the regulatory costs,  
14 I believe, and that is not correct.

15 Q. Sure, can you tell me what you did, though?

16 A. I looked at externalities, at effects that are not  
17 borne by the applicants and I tried to compare them to the, in  
18 a sense, positive externalities, which are the economic impacts  
19 of this project.

20 Q. Did you attempt to quantify the net economic impact of  
21 Big Stone II by comparing the externalities arising from air  
22 emissions of the plant to the economic development benefits  
23 projected as stated by Mr. Stuefen for the applicants?

24 A. Yes.

25 Q. Did you hear Mr. Stuefen testify in this case?

1 A. Yes.

2 Q. Did you hear him testify that the 50 percent induced  
3 spending number that he used, that his use of that figure or  
4 how he arrived at that figure was arbitrary?

5 A. Yes, I did hear it, but it's not -- it's not biasing  
6 because what I really need, but I didn't get it from the  
7 applicants, is the total economic impact, not just the state of  
8 South Dakota, because as I explained, externalities do not have  
9 geographic limitations, they are not limited to South Dakota.

10 MR. O'NEILL: All right, thank you. That's all the  
11 questions I have.

12 MS. CREMER: Ms. Stueve.

13 MS. STUEVE: Yes.

14 CROSS-EXAMINATION

15 BY MS. STUEVE:

16 Q. Good afternoon, Dr. Denney. I'm glad you're here.

17 A. Good afternoon.

18 Q. I'm looking at your direct testimony, which would be  
19 Exhibit -- I don't have the exhibit number.

20 A. Two.

21 Q. Thank you. On page 22 and line 16, 17 and 18, you say  
22 the responses to this interrogatory, and the line above tells  
23 what the interrogatory is, it's staff asks the applicant a  
24 follow-up interrogatory to provide the required calculation of  
25 environmental effects. So you say, the responses to this

1 interrogatory are not expected before the filing date of this  
2 testimony, therefore, staff performed its own calculation of  
3 the environmental effects. Have you since received an answer  
4 to the interrogatory?

5 A. Yes, and it did not contain the calculations.

6 Q. And could you repeat for me again your definition of  
7 externality?

8 A. It is costs not borne by the entity that causes the  
9 cost.

10 Q. So could we say we have an externality cost in this  
11 sense?

12 A. In relation to?

13 Q. In relation to staff performing its own calculation,  
14 the environmental effects, rather than the applicant.

15 A. I may be not understanding this, but isn't it correct  
16 that the applicants in a sense finance, allocate funds to the  
17 commission to hire a consultant?

18 MS. CREMER: I'm not sure, what is your question?

19 MR. SMITH: I think the answer to that is no because  
20 the applicants pay all our bills for this.

21 A. Yes, and I'm paid, too.

22 MR. WELK: As a direct cost, not an externality.

23 MS. STUEVE: All right, I'm not an economist. Thank  
24 you.

25 Q. (BY MS. STUEVE) I would go to page -- it's the direct

1 testimony, but it's one of the appendices, page two.

2 A. Do you mean Exhibit B?

3 Q. Exhibit A, page two, yes. I was looking at your  
4 academic publications. Could you explain a little bit on some  
5 of these related publications that deal with environment and  
6 did any of these publications that you did deal with any  
7 externalities analysis?

8 A. I'm reviewing the publications to provide a complete  
9 answer. First these are all publications related to my  
10 academic work. Second, all of them relate to externalities.  
11 That's the answer.

12 Q. I appreciate that. And that's the only question,  
13 comments I have. I like the mix of the economics and the  
14 environment.

15 MR. SMITH: Staff, do you have any redirect? Oh,  
16 commission, I'm sorry, pardon me.

17 EXAMINATION

18 BY VICE-CHAIR JOHNSON:

19 Q. Thank you, Ms. Denney. I was curious about the source  
20 of -- I'm sorry, I have the loudest vibrate cell phone in the  
21 history of the world, my apologies. The document, I believe  
22 it's Applicants' 117, Marginal Damage Estimates for Air  
23 Pollutants.

24 A. Yes.

25 Q. This was the document that you used to set the EPA



1 literature review.

2 A. Yes.

3 Q. This document is from 1998 and the source that it  
4 refers to, the Leach study, is from 1996. Were there any  
5 concerns on your part about using literature that was so dated?

6 A. Yes, of course I would prefer a more current source,  
7 but this was the most recent source published on the EPA Web  
8 site and I thought that if I use something that is published by  
9 the EPA rather than by academic literature, I will get less  
10 objections from the regulators. But I did look for more recent  
11 sources and I think the most recent source that is a really  
12 good, complete survey of the current literature, it's a 2005  
13 paper by Richard Tol, T-O-L, who is a professor at the  
14 University of Hamberg at Carnegie-Mellon University and he  
15 surveyed over 100 studies of the externalities for carbon  
16 dioxide only, which I think is really the issue in this case.  
17 And he in essence reaffirmed my position because he shows there  
18 is a really wide range between really small numbers to very  
19 large numbers, but then there's a cluster of estimates for the  
20 carbon dioxide and they all lie within I think a five, around  
21 five dollars, which is a value which is close to the Minnesota  
22 PUC and the value that -- under which you will get positive net  
23 impacts of the Big Stone if you do a sensitivity analysis of my  
24 calculation. To summarize, the new literature does not change  
25 the -- the interval published by the EPA, the numbers are

1 different but still it's wide, but the most frequent, I guess,  
2 estimates lie within the lower portion of that range.

3 Q. And as you can imagine, having such a broad range, \$1  
4 to \$51 does make it difficult to provide any guidance to  
5 regulators. The report you mentioned by Mr. Tol --

6 A. Yes.

7 Q. -- does staff intend to offer that as an exhibit?

8 A. I didn't really mean to. I didn't really mention it.  
9 It's an academic peer review publication in the journal called  
10 Energy Policy, I believe, let me double check. Yes, it's  
11 Energy Policy, Volume 33, 2005.

12 Q. And you said that -- again --

13 A. I may provide it if you want, if my counsel doesn't  
14 object.

15 MS. CREMER: If you would like that, we can certainly  
16 provide that, late filed.

17 VICE-CHAIR JOHNSON: I think it would be helpful. I  
18 would certainly read it. Not that I can't track it down on my  
19 own, but if it's part of the record.

20 MS. CREMER: We can put that in.

21 VICE-CHAIR JOHNSON: Thank you very much.

22 Q. (BY VICE-CHAIR JOHNSON) I want to make sure that I've  
23 heard you right. That paper by Mr. Tol also showed a large  
24 spread --

25 A. Yes.

1 Q. -- of academic literature, estimates for CO costs in  
2 academic literature, but most or majority or a large number of  
3 literature, the estimates were clustered around the \$5 per ton  
4 range?

5 A. Yes, he kind of graphed it as a distribution function,  
6 you know what I mean, and it does show that the majority of  
7 studies show somewhat low values and I think \$5 is kind of the  
8 peak of that, the most frequent observation in his graph.

9 VICE-CHAIR JOHNSON: Thank you very much. Mr. Smith,  
10 that's all I have.

11 MR. SMITH: Other commissioner questions.

12 COMMISSIONER HANSON: No, thank you.

13 CHAIRMAN SAHR: No, thank you.

14 MR. SMITH: Ms. Cremer, does staff have redirect?

15 REDIRECT EXAMINATION

16 BY MS. CREMER:

17 Q. Just to make sure that people understand your  
18 background, and I believe I understood it, you do have quite a  
19 bit of background in externality studies, right?

20 A. Yes.

21 Q. And can you just expand on what that is in case  
22 there's a question of your background?

23 A. Well, basically I specialized in this area for my  
24 bachelor's and for my master's thesis. I spent six years doing  
25 research on this, as I mentioned, in the Academic Institute in

1 Russia, and we did a lot of -- there are some theoretical  
2 things that you do, but you also do a lot of actual applied  
3 work and that was the years when the Soviet Union was still a  
4 farming economy, so what we did was our institute was involved  
5 in planning of what's called industrial complexes. For  
6 example, there is this region in Siberia where you have coal,  
7 you have coal-fired energy, electrical plants, you have  
8 industries that use that energy and so they plan it as a whole  
9 and our group was responsible for what is called the  
10 environmental model of that, a big model trying to account for  
11 the externalities associated with that development. So that  
12 would be probably the most relevant example.

13 MS. CREMER: Thank you, that's all I have.

14 MR. SMITH: Are we done?

15 MR. GLASER: I have nothing.

16 MR. SMITH: You are excused.

17 MS. STUEVE: I have a brief follow-up, very brief, if  
18 I may.

19 MR. SMITH: Yes.

20 MS. STUEVE: This is Mary Jo Stueve.

21 RECROSS-EXAMINATION

22 BY MS. STUEVE:

23 Q. The commissioner brought it up when he was asking  
24 about most recent publications and I'm just curious because  
25 your work on this project, you weigh negative environmental

1 im -- negative environmental effects to positive economic  
2 effects to come to a decision or a recommendation; is that  
3 correct?

4 A. Yes.

5 Q. So out of curiosity, I know I've read some recent  
6 publications within the past year or so where the reverse now  
7 can be true, there's some studies showing that ones will look  
8 at, for example, energy, what would be the positive  
9 environmental effects of not going with coal versus going with  
10 something that's more environmentally friendly and then weigh  
11 the economic effects. Is that possible?

12 A. Well, it is possible, but this case is application for  
13 a coal-fired facility, so that was my focus of study. I could  
14 not evaluate alternatives because that would be outside the  
15 application. I didn't have that information really to do that.

16 MS. STUEVE: Thank you.

17 MR. SMITH: Thank you, Ms. Denney. You are excused.  
18 Doctor, pardon me. Does that conclude staff's case?

19 MS. CREMER: Yes, it does.

20 MR. SMITH: At this point in time, with the  
21 stipulation that we had at the close yesterday.

22 MS. CREMER: Right.

23 MR. SMITH: If anything else occurs that is materially  
24 different from what the prefiled says, that you would be able  
25 to respond to that.

1 MS. CREMER: Right. At this point Dr. Denney's  
2 recommendation stands, having heard half the matter.

3 MR. SMITH: That's an encouraging thought.

4 VICE-CHAIR JOHNSON: Staff is still clearly not  
5 pleased with the order of testimony.

6 MR. SMITH: But your heroism is appreciated. I'm  
7 assuming that it's now 25 to 6:00, 5:35, that we ought to  
8 conclude for the day and commence to move our materials over to  
9 room 413. With that, the hearing -- we are going to go into  
10 recess until 8:30 in the morning tomorrow and we will be in  
11 room 413 tomorrow. Thank you, everyone.

12 (Whereupon, the proceedings were in recess at 5:35  
13 p.m.)

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STATE OF SOUTH DAKOTA     )  
  )  ss.  
COUNTY OF HUGHES            )

I, Carla A. Bachand, RMR, CRR, Freelance Court Reporter for the State of South Dakota, residing in Pierre, South Dakota, do hereby certify:

That I was duly authorized to and did report the testimony and evidence in the above-entitled cause;

I further certify that the foregoing pages of this transcript represents a true and accurate transcription of my stenotype notes.

IN WITNESS WHEREOF, I have hereunto set my hand on this the 28th day of June 2006.

*Carla A. Bachand*

Carla A. Bachand, RMR, CRR  
Freelance Court Reporter  
Notary Public, State of South Dakota  
Residing in Pierre, South Dakota.

My commission expires: June 10, 2012.

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