

South Dakota Public Utilities Commission

EL18-026 - In the Matter of the Application by Prevailing Wind Park, LLC for a Permit of a Wind Energy Facility in Bon Homme County, Charles Mix County and Hutchinson County, South Dakota, for the Prevailing Wind Park Project - Evidentiary Hearing

Tuesday, October 9, 2018

Room 413, State Capitol, Pierre, SD

Please Print

Name

Representing

Sherman Fuerniss

self

Lori Fuerniss

Mark Roberts

Prevailing Wind

Reece Almond

Intervenors - Gregg + Marsha Hubrey + Paula Lisa Schoenfelder

Kelli Pazour

self

Paul Schoenfelder

self

Lisa Schoenfelder

self

Lisa Agrimonti

Prevailing Wind Park, LLC

Mollie Smith

Prevailing Wind Park, LLC

Karen Jenkins

self

BRIDGET CANTY

PREVAILING WIND

Daniel Pardo

Prevailing wind

Chris Howell

Prevailing Wind

Scott Creech

Prevailing Wind

Aaron Anderson

PREVAILING WIND

Drew Huber

Intervenors

Marsha Hubrey

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THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

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IN THE MATTER OF THE APPLICATION EL18-026
BY PREVAILING WIND PARK, LLC FOR
A PERMIT OF A WIND ENERGY FACILITY
IN BON HOMME COUNTY, CHARLES MIX
COUNTY, AND HUTCHINSON COUNTY,
SOUTH DAKOTA, FOR THE PREVAILING
WIND PARK PROJECT

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Transcript of Hearing
October 9, 2018
9:00 a.m.
Volume I, Pages 1-331

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BEFORE THE PUBLIC UTILITIES COMMISSION,
KRISTIE FIEGEN, CHAIRWOMAN
GARY HANSON, VICE CHAIRMAN
CHRIS NELSON, COMMISSIONER

COMMISSION STAFF
Adam de Hueck
Karen Cremer
Greg Rislov

A P P E A R A N C E S

- Mollie Smith and Lisa Agrimonti,
appearing on behalf of Prevailing Wind Park;
- Reece Almond,
appearing on behalf of Intervenors Gregg Hubner,
Marsha Hubner, Paul Schoenfelder, and Lisa Schoenfelder;
- Sherman Fuerniss,
appearing pro se;
- Karen Jenkins,
appearing pro se;
- Kelli Pazour,
appearing pro se;
- Kristen Edwards and Amanda Reiss,
appearing on behalf of Staff.

Reported By Cheri McComsey Wittler, RPR, CRR
Precision Reporting, 213 S. Main, Onida, South Dakota

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The following transcript of proceedings was held in the above-entitled matter at the South Dakota State Capitol Building, 500 East Capitol Avenue, Pierre, South Dakota, on the 9th day of October, 2018, commencing at 9:00 a.m.

= = = = =

- (Applicant's Exhibits are marked.)
- (Intervenors' Exhibits are marked.)
- (Staff's Exhibits are marked.)
- (Fuerniss's Exhibits are marked.)
- (Jenkins's Exhibits are marked.)

1 CHAIRWOMAN FIEGEN: The South Dakota Public
2 Utilities Commission is called to order. We will begin
3 this hearing in Docket EL18-026, In the Matter of the
4 Application of Prevailing Winds Park, LLC for a Permit of
5 a Wind Energy Facility in Bon Homme County, Charles Mix,
6 Hutchinson Counties in South Dakota for the Prevailing
7 Winds Park Project.

8 It is 9:00 a.m. It is Tuesday, October 9, 2018,
9 and we are in Room 413 of the Capitol Building in Pierre,
10 South Dakota. I am Kristie Fiegen, and I am the Chairman
11 of the Commission. And with me today is fellow
12 Commissioners Gary Hanson, a little bit wounded but --
13 and Commissioner Nelson.

14 The hearing was noticed pursuant to the
15 Commission Order for and the Notice of Hearing issued on
16 September 11, 2018. The issue at that hearing as set
17 forth in South Dakota Codified Law 49-41B-22 is
18 determining, number one, whether the proposed project
19 will comply with all applicable laws and rules; two,
20 whether the project will pose a threat of serious injury
21 to the environment or the social or economic conditions
22 of inhabitants or expected inhabitants in the siting
23 area; number three, whether the project will have --
24 substantially impair the health, safety, and welfare of
25 the inhabitants; and, four, whether the project will

1 unduly interfere with the orderly development of the
2 region area and with due consideration having given --
3 have been given to the views of the governing body of the
4 affected local units of government.

5 Based on these facts, the Commission will decide
6 whether the permit shall be granted, denied, or granted
7 upon such terms, conditions, or modifications of the
8 construction, operation, or maintenance as the Commission
9 finds appropriate.

10 The Petitioner, Prevailing Wind, has the burden
11 of proof to demonstrate its right to relief as requested.
12 All parties have the right to be present and to be
13 represented by an attorney. All persons testifying will
14 be sworn in and subject to cross-examination by the
15 parties. The Commission's final decision may be appealed
16 by the parties to the State Circuit Court or the State
17 Supreme Court.

18 Adam de Hueck, which is one of our Commission
19 attorneys, will be acting as the Hearing Examiner and
20 will conduct the hearing subject to the Commission's
21 oversight. He may provide recommended rulings on
22 procedural and evidentiary matters. The Commission may
23 overrule his preliminary rulings throughout the hearing.
24 If not overruled, the preliminary ruling will become a
25 final ruling.

1 With that, Mr. de Hueck, the gavel is moved over
2 to you.

3 MR. DE HUECK: Thank you, Ms. Chairman.

4 Good morning, everyone. We will begin this
5 evidentiary hearing by taking the appearances of the
6 parties on the record.

7 With that, Prevailing Winds as the Petitioner,
8 we will begin with you.

9 MS. AGRIMONTI: Thank you, Mr. de Hueck. Lisa
10 Agrimonti and Mollie Smith on behalf of the Applicant,
11 Prevailing Wind Park, LLC.

12 MR. DE HUECK: Then I'll look over to
13 Mr. Almond.

14 MR. ALMOND: Reece Almond with the Davenport
15 Evans law firm on behalf of Intervenors, Gregg and Marsha
16 Hubner and Paul and Lisa Schoenfelder.

17 MR. DE HUECK: And now we have the Intervenors.
18 We have three Intervenors representing themselves. I'll
19 let you introduce yourself so I get your last name right.

20 MR. FUERNISS: Sherman Fuerniss. It's been
21 Americanized so just say furnace. And I'm representing
22 our family.

23 MS. JENKINS: Karen Jenkins, Intervenor.

24 MS. PAZOUR: Kelli Pazour, Intervenor.

25 MR. DE HUECK: And Staff.

1 MS. EDWARDS: Kristen Edwards and Amanda Reiss
2 appearing on behalf of Commission Staff.

3 MR. DE HUECK: Thank you. So now, counsel,
4 let's talk about the stipulated exhibits that arose
5 during our prehearing conference last week on Friday.
6 I'd like to talk about what has been stipulated to and
7 just go ahead and get those offered and admitted.

8 Ms. Agrimonti, would you like to -- can you
9 summarize what you think your understanding is? Just
10 yours.

11 MS. AGRIMONTI: Yes. I certainly can. On
12 behalf of the Applicant, I understand that all of the
13 Exhibits A1 through A33, with the exception of 20-1,
14 20-2, and 20-3. And A10 -- oops. I've got one more.
15 And Mr. MaRous, A16, have been stipulated to. So I'll
16 read that list again.

17 As I understand, still in dispute is A10. A16 I
18 have spoken with Mr. Reece Almond, and I know at least
19 the Intervenors do not have an objection to our
20 replacement Exhibit, A16R. The reason for that
21 replacement was to narrow the scope of Mr. MaRous's
22 testimony on rebuttal, given that Mr. Lawrence had been
23 withdrawn as a witness for Staff.

24 And then also A20-1, 20-2, and 21-3 were also
25 not stipulated to.

1 MR. DE HUECK: That syncs up with what I have.
2 I did have marked by A8 and A8-1 -- that was
3 Keith Thorstad. Could you tell the Commissioners a
4 little bit about what's going on there and why that's
5 been apparently now resolved?

6 MS. AGRIMONTI: Yes. Thank you. I appreciate
7 that opportunity.

8 In looking at the number of witnesses we saw
9 coming to the hearing, we looked for ways to consolidate,
10 and Mr. Peter Pawlowski will be addressing the
11 construction testimony that had been proposed by
12 Mr. Keith Thorstad.

13 So Mr. Pawlowski will be adopting Mr. Thorstad's
14 testimony, which is A8. And A8-1 has been withdrawn,
15 which is the resume from Mr. Thorstad.

16 MR. DE HUECK: Thank you.

17 Mr. Almond, are you okay with her summarization?
18 It syncs up with what I have marked from our prehearing
19 conference.

20 MR. ALMOND: Now that I've -- A16R, that's
21 accurate. We have no objections to the replacement
22 Rebuttal Testimony of Mike MaRous. I can't speak for the
23 other Intervenors.

24 CHAIRWOMAN FIEGEN: Do you think people online
25 can hear Mr. Reece [sic]?

1 MR. DE HUECK: Maybe just get your mic. closer.

2 MR. ALMOND: As far as A20-1, 20-2 and 21-3,
3 I've now reviewed those. They were provided, I think,
4 last night, and we have no objection to those. Again, I
5 can't speak on behalf of the other Intervenors.

6 So that would leave us with just A8 and A10, as
7 far as this camp is interested.

8 MR. DE HUECK: Thank you.

9 Mr. Fuerniss.

10 MR. FUERNISS: I wouldn't have anything to add
11 to that.

12 MR. DE HUECK: Okay. Mr. Almond has addressed
13 20-1, 20-2, and 20-3. He's okay with stipulating to
14 those being admitted and offered. You're on that --

15 MR. FUERNISS: Yeah. That's fine.

16 MR. DE HUECK: Ms. Jenkins.

17 MS. JENKINS: That's good.

18 MR. DE HUECK: Okay. Ms. --

19 MS. PAZOUR: Pazour.

20 MR. DE HUECK: Thank you.

21 MS. PAZOUR: I'm good with that too.

22 MS. AGRIMONTI: Mr. de Hueck, just to clarify
23 with Mr. Almond, I understand you're not stipulating to
24 A8 or A10 at this time?

25 MR. ALMOND: That's correct.

1 MR. DE HUECK: So moving on to Mr. Almond's
2 exhibits, would you like to do the same? I'm sorry. I
3 inadvertently skipped over Staff.

4 Staff, do you have anything to add?

5 MS. EDWARDS: I do not.

6 I meant I don't have anything to add about the
7 Applicant's exhibits. Are we moving on to ours now?

8 MR. DE HUECK: Yes. Let's go ahead and take
9 Staff.

10 MS. AGRIMONTI: I'm sorry to interrupt. Do we
11 need to move those exhibits, or we just accept them as
12 stipulated?

13 MR. DE HUECK: I was going to go ahead but if
14 you'd like to do a formal move and I'll admit them. Go
15 ahead.

16 MS. AGRIMONTI: On behalf of the Applicants,
17 I'll move admission of A1 through A33, with the exception
18 of A8 and A10.

19 MR. DE HUECK: Those will be admitted.

20 Staff.

21 MS. EDWARDS: Thank you.

22 And for clarification purposes, for those not
23 familiar with it, A32 on the joint -- the Proposed Permit
24 Conditions some of the Intervenors might have been
25 surprised to see.

1 So just so that everybody's aware, this is
2 typically what Staff does. And it doesn't mean we are
3 agreeing to the permit. This is just -- at a minimum if
4 the permit is granted, this is what we would want to have
5 seen. So for those who were surprised to see that this
6 morning, that's what's going on there.

7 Moving on to Staff Exhibits, I have S1 and S1
8 Confidential through S4 that I believe we all stipulated
9 to.

10 Forgive me. S2 was removed. So there should be
11 no S2.

12 And then I have S5, which I just sent out this
13 morning. That includes the additional data requests that
14 were received on Friday through the last round of
15 discovery. It only includes the ones received from
16 Mr. Almond and from the Applicant because individual
17 Intervenors had indicated they were submitting those --
18 their responses as their own exhibits so I didn't include
19 those as not to be redundant.

20 That's all I have.

21 MR. DE HUECK: Applicant, are you okay with
22 Staff's proposal?

23 MS. AGRIMONTI: We are.

24 MR. DE HUECK: Okay. Mr. Almond.

25 MR. ALMOND: No objection.

1 MR. DE HUECK: Mr. Fuerniss.

2 MR. FUERNISS: That's fine.

3 MR. DE HUECK: Ms. Jenkins.

4 MS. JENKINS: That's fine.

5 MR. DE HUECK: Ms. Pazour.

6 MS. PAZOUR: That's fine.

7 MR. DE HUECK: That takes us to Mr. Almond.

8 Oh, wait. Staff, would you like to formally --

9 MS. EDWARDS: Staff moves for the admission of
10 S1, S3, S4, and S5.

11 MR. DE HUECK: So admitted.

12 MR. ALMOND: And if I accurately marked my
13 exhibit list from Friday, those Intervenor Exhibits that
14 have been stipulated to are I-4, I-8, I-11, I-13, I-14,
15 I-16, I-17, I-18, I-21, I-22, I-20 -- no. Excuse me.
16 And then I-26 through I-34.

17 MR. DE HUECK: Applicant, does that sound good?

18 MS. AGRIMONTI: Yes. That's correct.

19 MR. DE HUECK: And Mr. Fuerniss?

20 MR. FUERNISS: Yeah. That's okay.

21 MR. DE HUECK: Ms. Jenkins.

22 MS. JENKINS: Yes.

23 MR. DE HUECK: Ms. Pazour.

24 MS. PAZOUR: Yes.

25 MR. DE HUECK: And Staff.

1 MS. EDWARDS: Yes. With the understanding
2 there's still some question as to the confidentiality of
3 some of those exhibits.

4 MR. DE HUECK: Correct.

5 MS. AGRIMONTI: Mr. de Hueck, we did have an
6 exchange yesterday I believe it was on the Exhibits I-16
7 and I-17, and Applicant has no objection to those being
8 filed publicly.

9 MR. DE HUECK: Excellent.

10 So, Mr. Almond, would you like to formally offer
11 your exhibits?

12 MR. ALMOND: Yeah. We'd move to admit I-4, 8,
13 11, 13, 14, 16, 17, 18, 21, 22, and 26 through 34.

14 MR. DE HUECK: Thank you. Those will be
15 admitted.

16 That will take us to Mr. Fuerniss.

17 MR. FUERNISS: Well, as I recall from the other
18 day, the only ones that were stipulated to by everybody
19 were 1 through 4.

20 MR. DE HUECK: Correct.

21 MR. FUERNISS: And I've added the two data
22 requests from Staff, the one from Applicant and also my
23 Rebuttal Responses, as 12 through 15. So I don't know
24 where we would stand on those.

25 MR. DE HUECK: I think we discussed that they

1 would be stipulated to. But I'll double-check with all
2 the parties.

3 So, Applicant, are you okay with Mr. Fuerniss's
4 summary?

5 MS. AGRIMONTI: One moment, please. I'm looking
6 for the 12 through 15. My numbers end at 13. I have
7 First Set of Data Requests from Staff on No. 12, which we
8 don't object to. We would stipulate.

9 13 is Staff's Second Set to Sherman
10 Fuerniss. Again, we would stipulate. I'm trying to find
11 the additional exhibits beyond that. Have I --

12 MR. DE HUECK: Mr. Fuerniss, could you tell us
13 what 14 and 15 are?

14 MR. FUERNISS: 14 is just a copy of Applicant's
15 Data Requests to me, and 15 was what I sent in as
16 Rebuttal Testimony.

17 MS. AGRIMONTI: As represented, I can't find
18 them on the actual exhibit page but I do recall those
19 exhibits and we would stipulate to the list that
20 Mr. Fuerniss has provided.

21 And just to be clear that would be 1 through 4,
22 and then 12, 13, 14, and 15 as he's represented 14 and
23 15.

24 MR. DE HUECK: Mr. Almond.

25 MR. ALMOND: No objection.

1 MR. DE HUECK: Ms. Jenkins.

2 MS. JENKINS: No objection.

3 MR. DE HUECK: Ms. Pazour.

4 MS. PAZOUR: No objections.

5 MR. DE HUECK: Staff.

6 MS. EDWARDS: No objection.

7 MR. DE HUECK: Mr. Fuerniss, would you like to
8 offer those exhibits?

9 MR. FUERNISS: Yes. I would move to offer those
10 exhibits.

11 MR. DE HUECK: They will be admitted.

12 Ms. Jenkins.

13 MS. JENKINS: I'm sorry.

14 MR. DE HUECK: Do you recall our prehearing
15 conversation about your exhibits that were stipulated to?
16 At that time you had six exhibits and then additional
17 exhibits. And I can help you out.

18 MS. JENKINS: Okay. I'm sorry. Can you tell me
19 which ones were not?

20 MR. DE HUECK: There were objections to your
21 first three exhibits. The rest we were all in agreement
22 with at that time.

23 MS. JENKINS: And the first three were the --

24 MR. DE HUECK: Conference program and conference
25 report.

1 MS. JENKINS: Okay. I'm fine with that.

2 MR. DE HUECK: I'll go to Applicant. Are you
3 okay with that?

4 MS. AGRIMONTI: Make sure I understand. That we
5 would stipulate to No. 4, 5, and 6.

6 MR. DE HUECK: Correct. And then she had some
7 additional exhibits at that time. It was a response to
8 Applicant e-mail to -- do you recall that?

9 MS. AGRIMONTI: Yes. And I'm reviewing those
10 now on my list. And, in addition, we would stipulate to
11 14 and 15.

12 MR. DE HUECK: Can you tell me what 14 and 15
13 are?

14 MS. AGRIMONTI: What I have on my list are
15 Amended Response to Applicant's First Set of Data
16 Requests to Intervenors.

17 MR. DE HUECK: Okay.

18 MS. AGRIMONTI: And then 15 I have as Response
19 to Staff's First Set of Data Requests.

20 MR. DE HUECK: All right. And objection on
21 those DR responses?

22 MS. AGRIMONTI: No objection to 14 or 15.

23 MR. DE HUECK: Okay.

24 Mr. Almond.

25 MR. ALMOND: I'm sorry. I didn't follow. How

1 did we get to 14 and 15 for Ms. Jenkins?

2 MS. AGRIMONTI: I'm sorry. Could you repeat?

3 MR. ALMOND: How did we jump to 14 and 15 for
4 Ms. Jenkins?

5 MS. AGRIMONTI: Mr. Almond, that's what I have
6 on my list here, and I was looking for ones that I would
7 be able to stipulate to.

8 KJ-7 appears to be an attachment to a response.
9 And I wanted to reserve those attachments.

10 MR. ALMOND: Is there an A through 13, I guess
11 is my question? I'm messed up on the numbering is all.

12 MR. DE HUECK: I'm right there with you,
13 Mr. Almond. I'm not sure. What I do know is what we've
14 now stipulated to.

15 Anything else that Ms. Jenkins tries to
16 introduce won't be offered and admitted at this time.
17 I'm not sure what those are either.

18 MR. ALMOND: Okay. No objection.

19 MR. DE HUECK: Okay.

20 MS. AGRIMONTI: Part of the confusion may be
21 that they're not numbered on the submission and so we
22 added numbers for our own tracking and they're not
23 syncing up. And so I apologize.

24 MR. DE HUECK: Okay. So with that, I think we
25 all have an understanding of what is being stipulated to

1 would be Ms. Jenkins's 4, 5, 6, 14 and 15.

2 Mr. Fuerniss, in agreement?

3 MR. FUERNISS: In agreement.

4 MR. DE HUECK: Okay. Ms. Pazour?

5 MS. PAZOUR: I agree.

6 MR. DE HUECK: Thank you.

7 And, Staff, you're in agreement with that?

8 MS. EDWARDS: Yes.

9 MR. DE HUECK: Okay. Ms. Jenkins, would you
10 like to formally offer those exhibits at this time?

11 MS. JENKINS: Yes. Thank you.

12 MR. DE HUECK: Yep. They'll be admitted. Thank
13 you.

14 Okay. So we've apparently resolved the
15 confidentiality issue that I thought might come up before
16 the hearing actually begins.

17 Were there any other outstanding matters we
18 needed to resolve or think about before we get going?

19 MS. AGRIMONTI: Sir, I have one oral motion I
20 would like to make this morning.

21 MR. DE HUECK: Okay.

22 MS. AGRIMONTI: In response to testimony from
23 the Applicant, Professor Alves-Pereira submitted
24 unsponsored rebuttal exhibits, and we believe that
25 without foundational testimony that those are not

1 properly before the Commission. We would move to exclude
2 those.

3 And that would be labeled I-25. There are
4 subparts A through F.

5 MR. DE HUECK: I'm going to have you say your
6 motion one more time. Try to get your real objection
7 nice and clear for us. That was a pretty heavy motion to
8 kick things off.

9 MS. AGRIMONTI: I will do my best. I'll lay a
10 foundation as this is an administrative proceeding where
11 we prefile testimony. We prefile direct. We prefile
12 rebuttal. It allows us to use our hearing time in the
13 most efficient manner as possible.

14 The professor submitted rebuttal but didn't
15 actually put in any testimony, just submitted exhibits,
16 and we believe that unsponsored exhibits is improper
17 rebuttal and we would move to strike them.

18 MR. DE HUECK: So that's why when I click on --
19 that's why it just says rebuttal exhibits for her.
20 There's no actual written testimony attached.

21 MS. AGRIMONTI: Correct.

22 MR. DE HUECK: Just exhibits.

23 Mr. Almond, have you had time to digest that?
24 Want to discuss on your end?

25 MR. ALMOND: Yeah. I-25 has not been stipulated

1 to. I anticipate covering those exhibits with Mariana
2 during her oral testimony.

3 As you know, Intervenors do not have the
4 opportunity to submit Rebuttal Testimony. Only the
5 Applicant is qualified to submit the written Rebuttal
6 Testimony.

7 After doing so, Mariana reviewed that and
8 anticipates providing oral Rebuttal Testimony. And to
9 cover those -- I think there was five attachments to I-25
10 during her oral testimony and lay the foundation for why
11 those are important and why the Commission should
12 consider those.

13 So ultimately I would argue that the Applicant's
14 Motion to Exclude is premature.

15 MR. DE HUECK: Mr. Fuerniss, do you have
16 anything to weigh in on this particular issue?

17 MR. FUERNISS: I don't think I can add anything
18 to that, no.

19 MR. DE HUECK: And Ms. Jenkins.

20 MS. JENKINS: I would agree with what Reece
21 said.

22 MR. DE HUECK: Ms. Pazour.

23 MS. PAZOUR: I don't have anything to add.

24 MR. DE HUECK: Okay. Staff.

25 MS. EDWARDS: Thank you.

1 I would oppose the motion simply because at the
2 beginning of everyone's testimony we always ask if they
3 have any additions or corrections to make, and at that
4 point generally there's an opportunity to respond to
5 anything that you heard during the hearing, although I do
6 sympathize with the fact that we endeavor to have
7 everything that we possibly can prefiled to make stuff
8 like this go smoother.

9 But I would think it would be more prudent to
10 wait and see how they are offered and responded -- in
11 response to testimony at the time that they are offered.

12 MR. DE HUECK: And I agree. I'm going to
13 reserve any type of decision until we've got the witness
14 up and these exhibits start to come in. If we feel
15 improper at that time, we can deal with it, but I'm in
16 agreement with Mr. Almond and Staff on this.

17 MS. AGRIMONTI: Thank you.

18 MR. DE HUECK: So is that all the preliminary
19 matters?

20 Mr. Almond, did you have anything outstanding?

21 MR. ALMOND: Nothing at this time.

22 MR. DE HUECK: Mr. Fuerniss.

23 MR. FUERNISS: No.

24 MR. DE HUECK: Ms. Jenkins.

25 MS. JENKINS: No.

1 MR. DE HUECK: Ms. Pazour.

2 MS. PAZOUR: No.

3 MR. DE HUECK: And Staff.

4 MS. EDWARDS: No.

5 MR. DE HUECK: Okay. Great.

6 That will take us to the case in chief from
7 Prevailing Wind. After their case in chief, we'll go to
8 the Intervenors' case in chief, and Prevailing Wind will
9 be given the opportunity for a final rebuttal.

10 Witnesses that have filed both Direct and
11 Rebuttal Testimony will offer all of their testimony when
12 they're initially called. Cross-examination will include
13 all the witnesses' testimony. Please begin with a brief
14 summary of the testimony, and then we will move into
15 cross-examination.

16 If a situation arises where we have some sort of
17 excess Rebuttal Testimony on the record for one reason or
18 another, the parties should address that when
19 appropriate, and we'll work on striking that excess
20 rebuttal from the record.

21 At this point we have Prevailing Wind's case in
22 chief, and we are not doing opening statements today as
23 decided during the prehearing conference last Friday.

24 So, Prevailing Wind, you may call your first
25 witness.

1 MS. SMITH: Thank you. Good morning. This is
2 Mollie Smith. I would call Aaron Anderson.

3 MR. DE HUECK: Oh, Ms. Smith, just for the
4 Commissioners' benefit, did you want to provide any
5 information on FedEx and your exhibits?

6 MS. SMITH: I most certainly will. So our
7 FedEx -- we sent exhibits on Friday. They were supposed
8 to arrive yesterday but due to some inability to land in
9 Sioux Falls for a portion of the day, those exhibits are
10 delayed.

11 We understand they are in the hallway and we are
12 just inserting the pieces that we had to print separately
13 and we will bring those in.

14 Mr. Anderson's testimony, however, and his
15 exhibits are up here so he does have a copy of those, as
16 well as the Application, so we can move forward with him
17 and hopefully maybe after that pull in our exhibits.

18 MR. DE HUECK: Great.

19 MS. SMITH: Thank you.

20 Aaron Anderson,
21 called as a witness, being first duly sworn in the above
22 cause, testified under oath as follows:

23 MS. SMITH: Sorry. I'm moving because I didn't
24 think Cheri would be able to see you, Mr. Anderson, while
25 I am asking you questions.

DIRECT EXAMINATION

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BY MS. SMITH:

Q. Mr. Anderson, can you introduce yourself to the Commission?

A. My name is Aaron Anderson. I'm with Burns & McDonnell engineering company.

Q. And can you give an overview of your education and your work history?

A. Sure. I have undergraduate degrees in physics and mechanical engineering, and I have a master's degree in engineering management.

I've been with Burns & McDonnell for 11 years. I run the wind energy department for Burns & McDonnell. During that time I have worked on projects throughout the United States in various capacities, including managing, performing and overseeing a number of shadow flicker studies just like this one throughout the country.

Q. And did you file Prefiled Direct Testimony in this matter with the Application on May 30, 2018?

A. Yes.

Q. And is that prefiled testimony marked as Exhibits A2 and A2-1?

A. Yes.

Q. And did you file Rebuttal Testimony in this matter on September 26, 2018?

1 A. Yes.

2 Q. And is that prefiled testimony marked as Exhibits A3
3 and A3-1?

4 A. Yes.

5 Q. And did your Rebuttal Testimony include some updated
6 shadow flicker results for the project?

7 A. Yes.

8 Q. And did you complete a report after that initial
9 Rebuttal Testimony was completed?

10 A. Yes.

11 Q. And is that updated report Exhibit A3-2?

12 A. Yes.

13 Q. And does that report that you have as Exhibit A3-2
14 contain the same results as were provided in preliminary
15 form with your Rebuttal Testimony?

16 A. Yes.

17 Q. Can you explain what changes were made that
18 necessitated an update to the Shadow Flicker Analysis?

19 A. There were a few. We updated the hub height of the
20 wind turbine. There was a modest increase in that. We
21 moved a couple of wind turbines by a small amount. And
22 we added some residences that were not in the original
23 report.

24 Q. And did you also remove a receptor?

25 A. We did.

1 Q. And was that A19 -- or Turbine 19?

2 A. Turbine 19, yes.

3 Q. And can you just give a brief summary of all of the
4 prefiled testimony that you've provided today, just a
5 brief summary of what you discuss?

6 A. It discusses a Shadow Flicker Analysis for the
7 project and the shadow flicker caused by the project's
8 wind turbines on occupied residences within the project
9 area.

10 Q. And do you have an understanding that there's been a
11 commitment by Prevailing Wind Park with respect to shadow
12 flicker in this -- for this particular project?

13 A. I do.

14 Q. And is that particular commitment outlined in the
15 Exhibit A32, I believe it is, in front of you,
16 paragraph 28?

17 A. Yes.

18 Q. And can you just read that for everyone since -- I
19 handed out copies, but not everyone might have a copy.

20 A. Sure. Item 29 from that proposed conditions list
21 says --

22 Q. I'm going to stop you. It's 28 so it would be on a
23 separate -- it will be on the other exhibit.

24 A. Got it.

25 It says that, "Applicant shall install turbine

1 control equipment on the project's turbines that allows
2 for individual turbines to be shut down as necessary to
3 ensure that shadow flicker does not exceed 30 hours per
4 year and/or 30 minutes per day at nonparticipating
5 residences. Applicant shall also take steps to mitigate
6 shadow flicker concerns at any residence that could
7 experience shadow flicker levels above 30 hours per year
8 or 30 minutes per day."

9 Q. So is it your understanding that this commitment
10 regarding not exceeding 30 hours per year or 30 minutes
11 per day at nonparticipating residences is project wide
12 now?

13 A. Yes.

14 Q. Other than the updates that we've talked about
15 today, if I asked you the questions that are in your
16 prefiled testimony, would your answers be the same?

17 A. They would.

18 MS. SMITH: I have no further questions and
19 offer Mr. Anderson for cross-examination.

20 MR. DE HUECK: Mr. Almond, you may cross-examine
21 the witness.

22 CROSS-EXAMINATION

23 BY MR. ALMOND:

24 Q. Good morning, Mr. Anderson.

25 A. Good morning.

1 Q. What are the problems with shadow flicker?

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

3 Q. Why are we regulating it?

4 A. Well, the purpose of my analysis was not to identify
5 problems with shadow flicker or to regulate flicker. It
6 was simply to identify how much shadow flicker occurred.

7 Q. So you're not aware of any problems caused by shadow
8 flicker?

9 A. The purpose of my analysis was simply to identify
10 duration.

11 Q. And I understand the purpose of your analysis, but
12 as someone familiar with shadow flicker, I'm asking are
13 you aware of any problems caused by shadow flicker?

14 A. I am aware of positions that people have taken that
15 shadow flicker is or is not a good thing, I suppose.

16 Q. What kind of positions do people take?

17 A. I have heard certain health-related effects, I
18 suppose, but I'm by no means an expert in that.

19 Q. What other type of complaints?

20 A. I'm not sure I know of others. That's the one that
21 immediately comes to mind.

22 Q. So the only complaints you've heard of with respect
23 to shadow flicker are health-related complaints?

24 A. As I --

25 MS. SMITH: Objection. Misstates testimony.

1 MR. DE HUECK: I'm going to ask -- this seems to
2 be outside Mr. Anderson's Direct Testimony, so I would
3 sustain the objection.

4 Q. Are you offering any opinions to this Commission
5 about whether or not shadow flicker causes any sort of
6 problems to anyone?

7 A. No.

8 Q. Okay. I want to talk a little bit about the shadow
9 flicker study that you performed. I think the most
10 recent analysis is Exhibit A3-2; correct?

11 A. That's correct.

12 Q. And you just testified that a few of the turbines
13 were moved; right?

14 A. I believe a couple moved a small amount, and there
15 was one turbine, Turbine 19, that was removed.

16 Q. Which turbines were moved a small amount?

17 A. I would have to get back to you on that one. I
18 don't know off the top of my head.

19 Q. Well, is there anything in the record or exhibits
20 that could refresh your recollection?

21 MS. SMITH: Your report is right there in front
22 of you.

23 THE WITNESS: It is. But it doesn't discuss
24 which turbines were moved.

25 MS. SMITH: Okay.

1 Q. How many turbines were moved?

2 A. I believe there were two moved and one removed.

3 Q. Right. T 19 was removed?

4 A. Removed.

5 Q. Okay. So the two that were moved --

6 A. I don't know the turbine numbers of those that were
7 moved.

8 Q. Do you know what part of the project they were
9 located in?

10 A. I don't.

11 Q. So from a -- from your perspective, how do you get
12 the project layout?

13 A. We receive turbine coordinates from the project
14 team, from the developer.

15 Q. All right. And in your analysis have you suggested
16 moving any turbines?

17 A. We have not.

18 Q. And in A3-2 -- which you have in front of you;
19 correct?

20 A. I do.

21 Q. You talk about the receptors. The receptors are
22 residences; correct?

23 A. There are 149 listed. Of those, two are cemeteries,
24 and the rest are occupied residences.

25 Q. Did your firm select the receptor locations, or were

1 those also provided?

2 A. We were provided with an initial list when we did
3 the initial evaluation. And we attempted to identify any
4 missing receptors based on a desktop analysis. So
5 through aerial imagery and things like that.

6 And then there were more that were added through
7 field verification where we went out, drove the site, and
8 verified that any houses that we found on the maps were,
9 in fact, occupied and included that were within the
10 project area.

11 Q. And what was the rationale for measuring shadow
12 flicker at the residences as opposed to the property
13 lines?

14 A. The analysis was done at the receptor location just
15 because it's consistent with industry standards. That's
16 how we do it in the majority of locations that we're
17 asked to perform these studies is at the residence
18 itself.

19 Q. And what other states is that considered the
20 industry standard?

21 A. Well, the industry would, of course, cover all of
22 the states. And in the analyses I've done that includes
23 10 states, I believe, something along those lines.
24 That's how we've done it, I believe, in every one.

25 Q. Every time you've performed an analysis, you've

1 performed analysis regarding the receptors are residences
2 and then perhaps some other sensitive areas like
3 cemeteries?

4 A. Actually cemeteries are a bit atypical to be
5 analyzed. They were included here, but, yes, when we
6 look at occupied residences we do it at the residences
7 themselves because that's where people are going to spend
8 the majority of their time.

9 Q. So you want to gauge the amount of shadow flicker
10 that someone's going to be exposed to at the residence
11 because that's where they spend the majority of their
12 time?

13 A. We want to measure the amount of flicker that
14 accumulates over the course of the year at a residence.

15 Q. And because that's where people spend a lot of time
16 is at the residence?

17 A. That's because that's how it's typically done
18 throughout the industry. That's the typical standard
19 from where it's measured at.

20 Q. If someone were to spend a lot of time outside,
21 would it be appropriate to measure the shadow flicker for
22 the property where they're spending time outside?

23 A. No, not necessarily. Again, we try to do the study
24 itself consistent with what the industry requires and how
25 these are done throughout the industry, and this is how

1 they're done.

2 Q. Looking at Exhibit A3-2, you've modeled out or
3 predicted the amount of shadow flicker at each receptor;
4 correct?

5 A. We have.

6 Q. And can you tell the Commission where that's located
7 at in Exhibit 3-2?

8 A. Where what specifically is located? I beg your
9 pardon?

10 Q. The predicted levels of shadow flicker at each
11 receptor.

12 A. Oh, I see. Sure.

13 The results are listed by receptors in Appendix F
14 Foxtrot, Table F, Foxtrot, -1. List the duration in both
15 hours per year and minutes per day for each of the 149
16 receptors.

17 Q. And that starts on page 35 of Exhibit A3-2?

18 A. That's correct.

19 Q. So, for example, Receptor 1 looks like that's a
20 nonparticipating residence, and your model is that it's
21 going to get zero hours of shadow flicker; correct?

22 A. Correct.

23 Q. And then you go through all 149 receptors and
24 provide your predicted levels; correct?

25 A. That's correct.

1 Q. How accurate is this study?

2 A. The study is as accurate as the model can be. It's,
3 again, consistent with how we've done all of our studies
4 throughout the country when we do these.

5 Q. So is there a margin of error?

6 A. No. Not a quantifiable one.

7 Q. Okay. Have you or your firm gone out and actually
8 tested your models to see how accurate they are?

9 A. We have not.

10 Q. Okay. Are you confident in these values in table --
11 or Appendix F?

12 A. I am confident in the analysis, yes.

13 Q. And the analysis includes those values in
14 Appendix F?

15 A. Yes. We believe the results are correct.

16 Q. Okay.

17 MR. ALMOND: No further questions.

18 MR. DE HUECK: Mr. Fuerniss, do you have any
19 questions of this witness?

20 CROSS-EXAMINATION

21 BY MR. FUERNISS:

22 Q. When you speak about industry standard, that makes
23 it sound to me as if that's kind of a self-regulating
24 thing, that the industry itself, excuse me, determined
25 this possibly independently of those that might be

1 affected by it?

2 A. What I intend when I say "industry standards" are
3 just a set of boundaries that are consistent are across
4 the country. So most -- there are no federal standards,
5 for instance, for shadow flicker, and most states don't
6 have requirements for shadow flicker. And, in fact, most
7 locations where projects are built don't have
8 requirements around shadow flicker for what sort of
9 duration must be in place. There certainly are some, but
10 they are the minority.

11 So what I mean when I talk about typical industry
12 standards are when these analyses are performed either
13 with or without those standards that may be in place, we
14 as an industry try to do those studies consistently in
15 every location that we go to.

16 That's what I'm referring to. We've done that
17 consistently with how we would do it in other
18 locations.

19 Q. Okay. And then, as I'm understanding it here,
20 possible affects of shadow flicker on residences,
21 negative, positive, whatever, is beyond the scope of what
22 you do?

23 A. Correct. I didn't opine in the study or here today
24 on any effects from shadow flicker.

25 MR. FUERNISS: Okay. Thank you.

1 THE WITNESS: You're welcome.

2 MR. DE HUECK: Ms. Jenkins.

3 CROSS-EXAMINATION

4 BY MS. JENKINS:

5 Q. I just would ask if you work in this field, it would
6 seem like you would understand the -- why we measure
7 shadow flicker, why it's important.

8 A. Is the question if I understand why we measure
9 shadow flicker?

10 Q. I think the question is it seems like you said that
11 you are not aware of health effects. And I just am
12 wondering if you are our expert witness and we're relying
13 on your testimony --

14 A. So I'm here to act as an expert on this Shadow
15 Flicker Analysis and how much shadow flicker will occur.
16 I am not presenting myself as an expert on any
17 health-related effects that may or may not occur from
18 shadow flicker.

19 MS. JENKINS: Thank you.

20 THE WITNESS: You're welcome.

21 MR. DE HUECK: Ms. Pazour.

22 CROSS-EXAMINATION

23 BY MS. PAZOUR:

24 Q. My question is you said either like six hours -- is
25 that right -- a year or 30 minutes a day?

1 A. The permit conditions that we've agreed to were
2 anything above 30 hours per year and/or 30 minutes per
3 day that we would mitigate.

4 Q. What do you mean by "mitigate"?

5 A. There are things that can be done such as turbine
6 control modifications. We can adjust when the turbine
7 operates.

8 Shadow flicker can only occur when a turbine is in
9 operation. If it's -- and when it's turning, that's when
10 the flicker effect can happen.

11 Q. Okay.

12 A. And we can modify when the turbine happens during
13 certain times of day or periods of year to ensure that
14 anything above 30 is mitigated, that it doesn't happen.

15 Q. But can it happen, though, over 30 minutes?

16 A. We are currently modeling that some receptors will
17 experience above 30, and the commitment that we're making
18 is that we will mitigate for those.

19 Q. Okay.

20 MS. PAZOUR: That answers my question.

21 MR. DE HUECK: Any further questions?

22 MS. PAZOUR: Not at this time.

23 MR. DE HUECK: Staff, cross-examination.

24 MS. REISS: Thank you.

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CROSS-EXAMINATION

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BY MS. REISS:

Q. Good morning, Mr. Anderson. How are you?

A. Good. Thank you.

Q. So in response to Mr. Pazour's questions you indicated that there's technology that would shut down a turbine if it got over 30 minutes per day or 30 hours per year; is that correct?

A. It's part of the machine itself, and it's simply a modification of the control software for the turbine. And we can modify that so that if flicker above a certain threshold occurs, whether that's hours per year, minutes per day, et cetera, we can adjust the turbine control settings and, simply put, tell it not to operate or to operate in a different way.

Q. Would that be an automatic shutdown, or would personnel need to shut that down?

A. I'm not sure that that's been defined at this point.

Q. Okay. Can you explain how a specific turbine would know that its shadow flicker would be problematic and over the proposed 30 hours or 30 minutes?

A. Sure. So the turbine itself is dumb. It wouldn't necessarily know that it's causing flicker on any particular thing. However, we know through the study, the geometry of where the sun rises, where it falls,

1 where everything is at, terrain, et cetera, so we can
2 identify with a high level of accuracy when during the
3 day and throughout the year flicker will occur, and we
4 can program the turbine accordingly.

5 Q. So it sounds like it would be a modeled calculation,
6 not an actual calculation at a receptor; is that correct?

7 A. I'm not sure. Probably.

8 But, again, I'm not sure that that detail's been
9 defined. I'm aware of what the commitment is. How
10 exactly it will be enacted, I'm not sure yet.

11 Q. Okay. Are you aware of whether this technology has
12 been used on other projects owned or operated by sPower?

13 A. By sPower I'm not aware.

14 Q. What about other companies?

15 A. Yes.

16 Q. And has the technology functioned as expected?

17 A. Yes. It's a common mitigation strategy.

18 Q. Okay. Do you categorize -- as you're calculating
19 shadow flicker, do you categorize the sensitivity of the
20 receptor based on where it's located?

21 A. Can you rephrase? I'm not sure I know what you mean
22 by the --

23 Q. Are all receptors treated the same way, or is there
24 categorization of the sensitivity, whereas potentially is
25 the receptor a school or a bedroom window or a garage?

1 A. They're not categorized differently in that way.
2 They're all treated the same.

3 Q. Okay. Just looking through the updated shadow
4 flicker report, it looks like there are a number of
5 receptors that would exceed the limit.

6 Are you aware of how many would exceed the 30 hours
7 per year?

8 A. In that report if you turn to Section 3 -- I'll
9 find a page number for you. It's page 14 of 67 in
10 Exhibit A3-2. There's a Table 3-1. And that shows the
11 breakdown of how many receptors will experience flicker
12 greater than or equal to 30 hours per year and how many
13 will experience greater or equal to 30 minutes per day.

14 So there are three total, two nonparticipating, one
15 participating, greater than 30 hours per year, and 27
16 that are above 30 minutes per day.

17 Q. Okay. Are you aware of the participating landowners
18 above the proposed limit, how many have agreed to this
19 level?

20 A. I haven't been a part of those discussions.

21 Q. And as far as a nonparticipating residence, have you
22 been a part of those conversations --

23 A. No.

24 Q. -- either?

25 Are you aware of another witness who may be able to

1 speak to those questions?

2 A. I'm not sure. Perhaps Mr. Pawlowski will be able to
3 speak to that.

4 Q. And then Mr. Almond asked you a question -- or a
5 couple of questions about health impacts and the need for
6 avoiding health impacts due to shadow flicker.

7 Do you recall?

8 MS. SMITH: Objection. This is outside the
9 scope of testimony.

10 MR. DE HUECK: What's your next question,
11 counsel? Because, yeah, we ruled on that.

12 MS. REISS: Correct.

13 There is a data request, Staff's Data Request
14 6.1, that refers to that issue, and I'd like to ask him
15 about the answer to that.

16 MR. DE HUECK: Did he answer it?

17 MS. REISS: Mr. Pawlowski provided a response
18 indicating that Mr. Anderson would be able to speak to
19 that.

20 MS. SMITH: Could you reference a little bit
21 more detail what you're talking about, Ms. Reiss, as far
22 as the answer? I'm just not sure what you're
23 referencing.

24 MS. REISS: If you pull up Staff's Exhibit 5,
25 Data Request 6-1 --

1 MR. DE HUECK: Can you read the question,
2 please.

3 MS. REISS: Yep. The question says, "Refer to
4 the Application, page 15-14. Please provide all studies
5 and supporting documentation that show a shadow flicker
6 requirement of less than 30 minutes per day or 30 hours
7 per year will avoid a significant adverse impact on
8 neighboring land uses and a significant adverse impact on
9 health."

10 MS. SMITH: I can represent that he was not
11 speaking to health. So if that is the question, it's
12 outside the scope of his testimony.

13 MR. DE HUECK: Yeah. I'm going to stick with
14 it's outside the scope of his Direct Testimony.

15 MS. REISS: Okay. Staff has nothing further.

16 MR. DE HUECK: That will bring us to
17 Commissioner questions where we have the opportunity to
18 let the Commissioners cross-examine the witness, as well
19 as Commission advisors.

20 And I'll start with Chair Fiegen. She'll have
21 the first round of cross-examination. Just to give her a
22 little bit of time to think, Mr. Anderson, I have
23 an elementary question I'd like to ask you.

24 So these receptors, they're outside the home
25 somewhere. Can you kind of give me a synopsis of how you

1 place a receptor?

2 THE WITNESS: We place a receptor as -- to
3 simplify it, think of it as a dot on a map, and we place
4 that at the home itself. And then that dot is what we
5 use to measure how much flicker accumulates at that
6 specific location.

7 MR. DE HUECK: So that would be flicker outside
8 the front door.

9 THE WITNESS: No. Because we model the home --
10 we use what we call a conservatively realistic approach.
11 So we model the home as a glass house. So we choose a
12 point -- think of it as the center of the home and
13 everything that would accumulate there.

14 In reality, there are walls, there's a roof,
15 everything else that could prevent flicker from coming
16 in, but we model it as a glass house to be conservative
17 so anything from any direction would accumulate at that
18 point.

19 MR. DE HUECK: So if you modeled the whole chunk
20 of property as a glass property, would it matter if you
21 moved that receptor all the way down to the property
22 line? The closer you get to a turbine, would you
23 increase shadow flicker?

24 THE WITNESS: Generally speaking, yes, it would
25 increase. It depends heavily on geometry.

1 So, for example, when the sun comes up in the
2 morning at this latitude it would be a little bit more
3 towards the southeast and due east so shadows would tend
4 to be cast to the northwest.

5 So a home due north of a turbine, flicker
6 impacts can be very minimal. So, yes, generally moving
7 closer would increase the effect, but it really all
8 depends on the location.

9 MR. DE HUECK: Okay. Yeah. Of the complex
10 geometry at play.

11 THE WITNESS: Yes.

12 MR. DE HUECK: I have no further questions.

13 CHAIRWOMAN FIEGEN: Thank you.

14 Just to clarify, I thought it was -- you talked
15 about the center of the house, but I thought it was
16 within 25 feet of the house that the receptor or maybe
17 the shadow flicker -- did I read that wrong in these
18 piles and piles and piles of paperwork?

19 THE WITNESS: We haven't modeled anything as a
20 25-foot buffer as it relates to shadow flicker.

21 CHAIRWOMAN FIEGEN: So it's the center of the
22 house?

23 THE WITNESS: Yes. Generally it's the center of
24 the house.

25 CHAIRWOMAN FIEGEN: Okay. You talked about --

1 somebody had a question about outside. And in
2 South Dakota we like to be outside when it's nice out.

3 THE WITNESS: Uh-huh.

4 CHAIRWOMAN FIEGEN: And then you talked about --
5 your response was industry requires. I didn't quite
6 understand that because I didn't --

7 Tell me about the industry requires you to do it
8 in the resident?

9 THE WITNESS: Sure. If I said it was an
10 industry requirement, I misspoke. What I was intending
11 to say is that it's a typical industry guideline. So
12 there are no specific requirements, per se, in the
13 industry or in applicable law that would dictate where
14 exactly a receptor is placed or how exactly it's modeled.

15 However, as an industry, the wind industry, we
16 have determined certain best practices, let's say, for
17 how shadow flicker will be analyzed and measured. And
18 those best practices include placing the receptor where
19 we measure flicker at the home. So that's what I was
20 intending to convey.

21 CHAIRWOMAN FIEGEN: All right. Thank you.

22 We're going to go back to the question about
23 being outside. So if it's an industry standard to do it
24 at the residence and you stated that the majority of the
25 time of the residence are spent at the -- no. Yeah. The

1 majority of the time of the citizen or the resident is
2 spent at their residence, yeah, I guess you could say
3 that when you're sleeping. That's probably true. But in
4 South Dakota people are outside a lot.

5 And so the daylight hours so many people are at
6 work, and then when they get home they're outside. So
7 why aren't we -- why doesn't your model consider the
8 acreage of when people are outside in their garden or
9 working in their shop or doing other things, working with
10 their horses or --

11 THE WITNESS: So when we build the model we have
12 a number of inputs that go into it and all of those
13 inputs are crunched and results are spit out. And those
14 results come in one of two forms.

15 They come as what we call contours. So if you
16 look at the maps in the back of the report, you'll see
17 what's called a -- it's like a butterfly shape. And,
18 again, that goes back to the geometry we were talking
19 about a moment ago. The sun comes up in one direction,
20 down in the other. And flicker tends to be cast further
21 in those northeast, northwest, southwest, southeast
22 directions.

23 So we have that information. But, again, I
24 would go back to just generally how these are performed
25 and where they're measured. And we need to measure it at

1 a specific location in order to present results in a
2 concise and logical format, and that goes back to doing
3 it at the home itself. So that's what you'll see in the
4 tabular results of the study.

5 CHAIRWOMAN FIEGEN: I was surprised at your
6 response of your model and asked how accurate it was and
7 if you've ever tested its accuracy after construction.

8 THE WITNESS: Uh-huh.

9 CHAIRWOMAN FIEGEN: Did I understand you right
10 that you said, no, you have not tested the model for its
11 accuracy after construction?

12 So if that is the case, why can the Commission
13 believe that these shadow flicker studies are accurate?

14 THE WITNESS: Sure.

15 So, to clarify, we do believe that the results
16 are accurate. We believe that it was modeled
17 appropriately.

18 When he asked about the margin of error, for
19 instance, there's simply just no answer for that. There
20 is no objective, quantifiable number that I could give
21 you with a straight face and say this is accurate to
22 75 percent, 100 percent, 0 percent, pick your favorite
23 number.

24 The nice thing about shadow flicker is that it
25 is -- while it's a complex model, it's a very understood

1 phenomenon that's happening.

2 So we know specifically where the sun's going to
3 be. We know specifically what terrain looks like, what
4 turbines look like, et cetera, so we can model with a
5 really high level of confidence and accuracy as a result
6 of where shadows will be cast, how the turbines will
7 operate, and how much will accumulate.

8 So that's where the confidence comes from with
9 what the results are showing us.

10 CHAIRWOMAN FIEGEN: So your model of shadow
11 flicker, does it take into consideration trees,
12 buildings? Is that my understanding, it takes into
13 consideration all of that?

14 THE WITNESS: Sort of.

15 We consider terrain. So if a turbine is down in
16 a valley and a house is up on a hill, it's possible that
17 a shadow wouldn't get up there. That's a simple one.

18 When we do our initial analysis, again, I had
19 mentioned that we do this conservatively realistic
20 approach. So we'll do things like we will model the home
21 as a glass house, for example.

22 When we model how the turbine operates, we look
23 at wind data for the year and try to estimate when those
24 shadows are going to be cast.

25 As it relates to obstacles, our initial analysis

1 includes none. So we don't consider any barns, any hedge
2 rows, any trees, any neighboring houses, et cetera,
3 nothing that would block shadow flicker. That's how the
4 initial analysis is done.

5 Then we identified, after that analysis,
6 residences that experienced more than the
7 30-hour-per-year threshold, and we did add obstacles in
8 the model at those locations. Those are the ones that
9 are marked with an asterisk in the results table.

10 CHAIRWOMAN FIEGEN: I forgot. I looked at those
11 two tables of the no trees, no buildings. How many
12 receptors had issues of 30 minutes or 30 hours on the no
13 obstacle table?

14 I can't remember that. I looked at that, and
15 now I can't remember.

16 THE WITNESS: Off the top of my head, I don't
17 know. If you'd like, I could --

18 CHAIRWOMAN FIEGEN: So is it more? Is it more
19 than your 3 and 27?

20 THE WITNESS: Yes.

21 CHAIRWOMAN FIEGEN: Okay. So then if people
22 take down trees or buildings, there could be an issue
23 with shadow flicker with those residences.

24 THE WITNESS: If we modeled that as an obstacle,
25 it's possible, yes.

1 What we found, if you read the results, however,
2 the obstacle analysis had a fairly de minimis impact. It
3 was not a significant reduction. So I would offer that
4 in the scenario where someone did remove, say, a grain
5 bin or a hedge row or something like that, sure it's
6 possible that that flicker could increase, but it would
7 be a fairly small impact that results.

8 CHAIRWOMAN FIEGEN: Two remaining questions.
9 One of them was your mitigation.

10 Is the only mitigation to shut off the turbine?

11 THE WITNESS: No.

12 CHAIRWOMAN FIEGEN: Okay. So is one of your
13 mitigations to put screens on the windows, and that's a
14 mitigation that one of your residents would have to just
15 deal with?

16 THE WITNESS: That's not what we're proposing.
17 It is a mitigation option, but that's not what we've
18 proposed.

19 CHAIRWOMAN FIEGEN: Okay. And you're proposing?

20 THE WITNESS: Turbine controls. So modifying
21 the operation of the machine.

22 CHAIRWOMAN FIEGEN: All right. So your
23 mitigation is pretty much all controls. All right.

24 And then the other final question is you work in
25 multi states, and I think -- I can't -- it just said

1 multi states, I think.

2 THE WITNESS: Uh-huh.

3 CHAIRWOMAN FIEGEN: Then you did make a
4 statement that there are some states or counties or
5 somewhere that do have shadow flicker regulations. Can
6 you just tell us about that?

7 I think that's what you stated.

8 THE WITNESS: I did. I would be misleading you
9 if I told you what all of those were specifically. I can
10 tell you more anecdotally that 30 hours per year, for
11 example, is when we do see a requirement, the prevailing
12 standard that's used.

13 So this is very much consistent with when
14 we've used regulations, what those regulations would call
15 for.

16 CHAIRWOMAN FIEGEN: Which states are those?

17 THE WITNESS: I would have to get back to you on
18 that. We can prepare a list. There are lists out there.
19 They're generally more regulated at the county level than
20 the state level, however.

21 CHAIRWOMAN FIEGEN: Okay. Thank you.

22 THE WITNESS: You're welcome.

23 MR. DE HUECK: Vice Chairman Hanson, do you have
24 any cross-examination?

25 COMMISSIONER HANSON: Thank you.

1 Good morning.

2 THE WITNESS: Good morning.

3 COMMISSIONER HANSON: I just have a curious
4 question on how the Prevailing Wind Park -- Prevailing
5 Winds will monitor the durations of shadow flicker. I'm
6 not quite clear. Would you review that for me, please.

7 How will they be certain that there's 5 minutes
8 this day and 40 minutes another day?

9 THE WITNESS: So there's currently no plan to do
10 postconstruction monitoring, which is again consistent
11 with what we see throughout the industry.

12 If you look at the back of Exhibit A3-2, which
13 is the report we've prepared, you'll see what we call
14 calendars, and that shows for every receptor over the
15 course of the year, which is along the bottom, then over
16 the course of the day, which each individual hour is
17 shown on the Y axis, it will show when that flicker,
18 whether it's 1 hour, 2 hours, 10, whatever, how it
19 accumulates through the year.

20 So we'll know quite specifically at each
21 receptor when it's expected to happen and can mitigate
22 accordingly based on that.

23 COMMISSIONER HANSON: So it's a little bit more
24 than a guesstimate based on you'll know where the sun is
25 certainly. However, you won't know for sure what type of

1 clouds there are, things of that nature?

2 THE WITNESS: To an extent, I would agree with
3 that. It is more than a guesstimate. It's fair to say
4 that on a cloudy day we would not need to mitigate shadow
5 flicker, for example.

6 COMMISSIONER HANSON: When you show, for
7 instance, 33.9 hours of flicker per year on Receptor
8 076 --

9 THE WITNESS: Uh-huh.

10 COMMISSIONER HANSON: -- what's the spread on
11 that? Obviously, your analysis shows a high and a low.

12 THE WITNESS: Sure. So I would point you to --
13 if you've got that report, Exhibit A3-2, page 54 of 67.

14 COMMISSIONER HANSON: Thank you.

15 THE WITNESS: I'll give you a minute to get
16 there.

17 COMMISSIONER HANSON: No. Go ahead.

18 THE WITNESS: So in the middle of that page on
19 the right side you'll see a box labeled Receptor 076, and
20 it's got an orange blob and a pink blob. And those
21 correlate to turbine numbers, and you can see them
22 cryptically defined at the bottom.

23 So, for example, the orange blob is Turbine
24 28.23, and the pink blob is Turbine 28.24. To address
25 your question, what this shows is that from those

1 turbines, shadow flicker would occur at this residence
2 from the orange turbine, 28.23, in the month of January
3 and very early February as well as November through
4 December of roughly between the hours -- the printout
5 isn't great. It looks like 8:30 to 9:30, somewhere in
6 that vicinity. And the same for the other turbine would
7 be late afternoon, which is typical of what we see from
8 shadow flicker.

9 COMMISSIONER HANSON: My question was on 76.

10 THE WITNESS: That is Receptor 76.

11 COMMISSIONER HANSON: It is. Okay.

12 THE WITNESS: Yes, sir.

13 COMMISSIONER HANSON: And what's the high and
14 low on it?

15 THE WITNESS: I don't understand. The high and
16 low for what?

17 COMMISSIONER HANSON: For the number of hours in
18 a year.

19 THE WITNESS: Oh. 33.9.

20 COMMISSIONER HANSON: That's the high.

21 THE WITNESS: That's the modeled total. So
22 there is no high or low, per se.

23 COMMISSIONER HANSON: Well, you have to be
24 working with some type of analysis there where you're --
25 I understand what you're telling me, but what I want to

1 know from you from your expertise is what would be the
2 maximum number of hours one could expect.

3 THE WITNESS: I understand.

4 My opinion is, based on how the analysis
5 performed, that that is a very conservative, i.e.,
6 worst-case number that we would expect to occur. And I
7 would make that point based on how the model has
8 performed.

9 Let's go back to the glass house example that
10 we've talked about. Obviously, nobody's home is built of
11 glass. So walls, curtains, et cetera, would help to
12 mitigate what these results were showing.

13 Any obstacles that we haven't considered would
14 help to mitigate what this is showing. I would consider
15 33.9 to be a worst-case end of the spectrum and that
16 actual values will likely be lower.

17 COMMISSIONER HANSON: All right. I appreciate
18 the very last part of your statement there, that you
19 expect that 33.9 would be the maximum. I'm not on board
20 completely with mitigation based on curtains and walls
21 and things of that nature, just so that you understand
22 that.

23 THE WITNESS: Understood. That's why we don't
24 model it that way. It's simply to point out that there
25 are things that will cause the number to reduce.

1 COMMISSIONER HANSON: All right. Thank you.
2 No further questions.

3 COMMISSIONER NELSON: Ms. Reiss asked what I
4 thought were some excellent questions about how the
5 mitigation of -- strategy as it relates to the turbines
6 themselves actually operate, and you gave some very vague
7 answers.

8 Which witness can answer that with specificity?

9 THE WITNESS: I believe Mr. Pawlowski can speak
10 to that.

11 COMMISSIONER NELSON: I understand from your
12 background -- you've got a science background; correct?

13 THE WITNESS: I do.

14 COMMISSIONER NELSON: My understanding in
15 science when one has a hypothesis the next step of the
16 scientific method is to develop an experiment or a test
17 of that hypothesis to determine whether it's accurate; is
18 that correct?

19 THE WITNESS: It is.

20 COMMISSIONER NELSON: And yet with your model
21 you've testified that you have not endeavored to
22 determine the accuracy of the model; is that correct?

23 THE WITNESS: It is. That we -- we don't do
24 postconstruction monitoring of this model. However, I
25 would indicate that the model is -- it's a third-party

1 software. It's prepared by others, and I would have to
2 assume -- I can't say with certainty, but I would have to
3 assume that they verify the accuracy of what their model
4 predicts.

5 COMMISSIONER NELSON: Thank you. And just for
6 the record, we don't deal with assumptions here. We deal
7 with fact. Thank you.

8 Why is 30 -- we've talked a lot about 30 hours.
9 Why is 30 hours acceptable and 31 is not?

10 THE WITNESS: I don't know how that guideline
11 came to be or how that -- how that number came to be.

12 COMMISSIONER NELSON: So you've spent all this
13 time doing all this testing, but you have no idea why; is
14 that correct?

15 THE WITNESS: No. I don't think that that's a
16 fair thing to say. I would just submit that 30 is
17 typical or consistent with what we do see when there are
18 regulations in place.

19 And, again, my understanding here is there are
20 actually no strict requirements in place for what -- for
21 what flicker would have to be mitigated above. So we're
22 simply being consistent with the industry standards.

23 COMMISSIONER NELSON: So did Prevailing Winds
24 provide you with the 30-hour threshold that you're
25 measuring against? Where did the 30 come from?

1 THE WITNESS: Well, we prepared our results
2 independent of whether the value was 30 or 10 or 100.
3 The 30 was an agreement between Prevailing Winds and --
4 well, it was submitted by Prevailing Winds, by the
5 Applicant.

6 COMMISSIONER NELSON: So the Applicant
7 determined that 30 was okay and 31 was not; is that
8 correct?

9 THE WITNESS: The Applicant determined that 30
10 would be the condition that they've submitted here today.
11 Yes.

12 COMMISSIONER NELSON: And is there a witness
13 that can address how 30 was arrived at?

14 THE WITNESS: I believe that Mr. Pawlowski can
15 speak to that, yes.

16 COMMISSIONER NELSON: Thank you. No further
17 questions.

18 MR. DE HUECK: That takes us to -- oh, yep.
19 Commissioner Fiegen.

20 CHAIRWOMAN FIEGEN: Could you help me figure out
21 on the table that you have on your receptors like 76, 17,
22 27, 31, which residence they are and which towers?

23 Do you have that somewhere in all the
24 information?

25 THE WITNESS: I do. So this information we did

1 not include the homeowner's name, but it's available and
2 can be provided.

3 I beg your pardon.

4 CHAIRWOMAN FIEGEN: So you could show us the
5 dots?

6 THE WITNESS: On a map, absolutely.

7 CHAIRWOMAN FIEGEN: Okay. And then you could
8 also show us the towers that you're dealing with; right?

9 THE WITNESS: So the information is there, if
10 that's what you're asking for.

11 So, for example, if you were to look at this
12 same report, which is Exhibit A3-2 --

13 CHAIRWOMAN FIEGEN: Okay. Like A -- okay. I'll
14 write that down.

15 THE WITNESS: Yeah. No problem.

16 CHAIRWOMAN FIEGEN: Go ahead. Tell me again.

17 THE WITNESS: Sure.

18 So there's an Appendix A, Alpha, that includes a
19 map of where every turbine is at and where every receptor
20 is at. So those show the receptors by number. They do
21 not list the homeowner's name. And they also show which
22 turbines they are.

23 And then in the calendar information that we
24 were discussing a few moments ago, and it's H, hotel,
25 that shows which specific turbine causes shadow flicker

1 on each specific receptor.

2 CHAIRWOMAN FIEGEN: Thank you. There is more
3 documentation in this evidentiary hearing so it's hard to
4 find --

5 THE WITNESS: I understand.

6 CHAIRWOMAN FIEGEN: -- all those type of
7 information.

8 Thank you.

9 MR. DE HUECK: Mr. Rislov.

10 MR. RISLOV: As I listen to this, I'm curious.
11 Does your 30 hours reflect cloudy days, overcast days,
12 snow days, or does it reflect full sunlight all the
13 time?

14 THE WITNESS: We have what we call a sunshine
15 factor or a sunshine probability. So we do not model the
16 sun shining every day throughout the year because days
17 like this the sun just doesn't shine. So we gather
18 data -- we gather historical weather data, and we assign
19 a probability to each month on how many hours during that
20 month there will be enough sunlight to create flicker.

21 MR. RISLOV: One additional question. You talk
22 about the glass house. I assume everyone's sitting here
23 thinking the center of the house. How material is moving
24 75 feet toward the tower on any given day?

25 I mean, I can't believe it just ends at this

1 spot. So if I walk 75 feet closer to the tower or
2 100 yards, what effect does that have on shadow flicker
3 as far as the strength or the visibility of the shadow
4 flicker?

5 THE WITNESS: So the visibility of the shadow is
6 evaluated the same throughout the buffer from the
7 turbines that we look at. So there is no change. A
8 shadow at 10 feet is accumulated. It's considered the
9 same way as a shadow at 500 feet, for instance.

10 So to address your specific question, though,
11 the unfortunate answer is that it depends on which way
12 you move. So, again, being due north or due south of a
13 turbine, if you were to move in a direction that hits you
14 in one of those ways, would actually be beneficial from a
15 flicker standpoint. It would, generally speaking, reduce
16 the amount that accrues.

17 But, to your point, moving closer to a turbine
18 would typically increase the amount of shadow flicker
19 that would occur.

20 MR. RISLOV: I understand that. But --

21 Okay. For example, we have a house. I have a
22 garden on the north side, and I have a garden on the
23 south side, both 50 feet from the house.

24 THE WITNESS: Uh-huh.

25 MR. RISLOV: Are you telling me if the turbine's

1 on the south side, I'm going to experience shadow flicker
2 much stronger or whatever on the south side than I would
3 on the north side?

4 THE WITNESS: Stronger, no. It's experienced
5 all the same. I would offer that if your garden was on
6 the north side and you were in the garden, that your
7 house would block flicker from occurring.

8 MR. RISLOV: No, no. I'm apart from the house.
9 Okay. They're both in direct line to the tower.
10 One's 50 feet south of the house. One's 50 feet north.
11 So if I'm in the north garden, I'm just fine? If I'm in
12 the south garden, I'm experiencing shadow flicker?

13 Is there a materiality in 50 feet one direction
14 or the other?

15 THE WITNESS: No. No. It would not be a
16 substantive difference.

17 MR. RISLOV: Thank you.

18 MR. DE HUECK: Commissioner Nelson, follow-up.

19 COMMISSIONER NELSON: Follow-up.

20 When you were discussing with Commissioner
21 Hanson the graph on page 54 in relation to Receptor 76
22 and you were talking about the two different turbine
23 numbers that were impacting, are those turbine numbers on
24 that graph? Can you help me find them?

25 THE WITNESS: Yeah. It's a little bit cryptic.

1 So hopefully your printout is better than mine
2 but there's an orange blob and a pink blob.

3 COMMISSIONER NELSON: Yes.

4 THE WITNESS: And if you look at the very
5 bottom, there's a legend, so to speak, that says WTG for
6 wind turbine general. And with the software it has a lot
7 of extra text, but the important thing is right after the
8 orange blob it says 28.23. That's the turbine number
9 corresponding to the orange blobs. And 28.24 is the
10 turbine number corresponding to the pink blobs.

11 So those are the two machines that would cause
12 flicker on that particular residence.

13 COMMISSIONER NELSON: So 28.23, 28.24, we don't
14 have turbine numbers 28 point something.

15 THE WITNESS: Those were -- I could verify that.
16 There was some turbine numbering that updated, and I
17 could get back to you on T-1, T-2, et cetera, and draw
18 that correlation for you.

19 It's the same layout. The turbine numbering was
20 just updated over time.

21 COMMISSIONER NELSON: Okay. But I want to be
22 able to figure this out, so if you could at some point
23 help me with that, I'd appreciate it.

24 THE WITNESS: We can.

25 COMMISSIONER NELSON: Thank you.

1 MR. DE HUECK: It looks like that concludes
2 Commission, which will take us to redirect by the
3 Applicant.

4 MS. SMITH: I have no further questions.

5 MR. DE HUECK: Is there any recross based on
6 Commission questions?

7 MR. ALMOND: Yeah.

8 RE CROSS-EXAMINATION

9 BY MR. ALMOND:

10 Q. Commissioner Hanson, I believe it was, was asking
11 about other jurisdictions and how they treat shadow
12 flicker.

13 Are you aware of any jurisdictions that do not allow
14 any shadow flicker to occur at nonparticipating
15 residences?

16 A. No. I'm not aware of any.

17 Q. You've never encountered any jurisdictions at your
18 time at Burns & McDonnell that have prohibited shadow
19 flicker --

20 MS. SMITH: Asked and answered.

21 Q. -- on nonparticipating residences?

22 MR. DE HUECK: Sustained.

23 MR. ALMOND: No further questions.

24 MR. DE HUECK: Any redirect -- recross based
25 solely on questions that were asked by the Commissioners?

1 Mr. Fuerniss?

2 RE CROSS-EXAMINATION

3 BY MR. FUERNISS:

4 Q. Well, I think this would tie in. But Commissioner
5 Nelson was asking about where the 30 hours came from.
6 And could you tell us that -- that 30 hours is the
7 industry standard, that's a best practice for the
8 industry, not necessarily for the residents.

9 The 30 hours is a best practices as far as the
10 industry goes.

11 A. The 30 hours is a typical industry guideline.

12 Q. But the point I'm getting at, it was arrived at by
13 the industry in the best interests of the industry.

14 A. No --

15 MS. SMITH: I think it's asked and answered.

16 MR. DE HUECK: I'm going to let him elaborate.
17 We've got some flexibility here.

18 A. I wouldn't say it was established by the industry
19 for the industry. I'm telling you it's a value used by
20 the industry.

21 I can't sit here today and tell you who specifically
22 came up with the value. I can only tell you that it's a
23 value as an industry that we -- that we use and we use
24 consistently through a number of jurisdictions.

25 MR. FUERNISS: Okay. Thank you.

1 MR. DE HUECK: Ms. Jenkins, do you have any
2 recross again based solely on questions that were asked
3 by the Commissioners?

4 RECCROSS-EXAMINATION

5 BY MS. JENKINS:

6 Q. Okay. I think this would tie in.

7 My question is when you speak of industry what
8 industry are you talking about?

9 A. The wind industry.

10 Q. Okay. And could you give me examples of the people
11 that make up the wind industry? Like how --

12 A. There are a number of participants, and they range
13 from independent contractors and consultants like myself
14 to people who are developing and designing wind projects
15 to even in some cases people who object to the industry
16 and what they're trying to do.

17 All of those things factor into what creates and
18 what molds what those guidelines become over time.

19 Q. Okay. And do you know of any jurisdiction that
20 allows or requires less than 30 hours shadow flicker?

21 A. There are many that don't have any requirement at
22 all. So, said differently, there are many jurisdictions,
23 whether those are -- let's use counties, for example,
24 that would not have any limitation on how much flicker
25 could occur.

1 So that could be a seemingly infinity amount. Of
2 course, we would try to avoid that, but some have no
3 requirement at all for what that limit would be.

4 Q. Thank you.

5 So in the jurisdictions that do have requirements,
6 do you know of any that are less than 30 hours?

7 A. The only one I know about in the United States is
8 the State of Wisconsin. Perhaps it's a county in
9 Wisconsin. You'll have to forgive me. But somewhere in
10 Wisconsin has a requirement where the limit is 30, but
11 they require mitigation above 20. But that's very much
12 the exception and not the norm.

13 Q. So the limit is 30 --

14 A. I believe they require mitigation avoidance,
15 reduction of shadow flicker above 20 in that specific
16 jurisdiction. That's the only one I know of that's less
17 than this.

18 Q. I think the -- would you be able to tell me when the
19 last time the industry standards for shadow flicker was
20 updated?

21 A. There's no written guideline, per se, so there's no
22 code I could point you to that says here's the value. I
23 could simply direct you to what my firm and others like
24 us do, which there are probably numerous examples on-line
25 just like this one where the approach, the values used

1 and other things like that, have become fairly
2 standardized and consistent so that when I talk to you
3 today or if I talk to another Commission two weeks from
4 now that I can hopefully tell you that I'm doing things
5 under a consistent, similar manner.

6 Q. Okay. And is there any government regulation about
7 these standards?

8 A. There are no federal requirements, and there are,
9 generally speaking, no state requirements.

10 Q. I'm sorry. Just a moment.

11 A. No problem.

12 Q. Are you aware of outside of the United States if
13 there are standards less than 30?

14 A. I don't know. I haven't made it a habit of studying
15 foreign requirements.

16 Q. Okay. And are you aware that the wind energy has
17 been in the -- outside of the United States a lot longer
18 than it has been inside?

19 A. I am.

20 Q. Okay.

21 MS. JENKINS: That's all I have.

22 MR. DE HUECK: Ms. Pazour, do you have any cross
23 based again on Commissioner questions only?

24 MS. PAZOUR: The answers were already asked for
25 me.

1 MR. DE HUECK: Okay. Thank you very much.

2 MS. PAZOUR: Thank you.

3 MR. DE HUECK: Commissioner -- oh, Staff.

4 MS. REISS: Thank you. Just one quick question.

5 RE CROSS-EXAMINATION

6 BY MS. REISS:

7 Q. I believe Commissioner Fiegen asked about measuring
8 shadow flicker outside of the home because there's a lot
9 of usage on the property by landowners.

10 Do you recall that?

11 A. I do.

12 Q. Did you take any steps to measure shadow flicker at
13 public roads?

14 A. No.

15 Q. Is there a reason why you didn't measure shadow
16 flicker on public roads?

17 A. We, to be frank, have never been asked or even
18 considered it because the prevailing guideline has been
19 to measure it at the home itself.

20 Q. Are you aware of any public roads within the project
21 area that may be affected by shadow flicker?

22 A. Not specifically, no. I'm aware that there are, of
23 course, public roads within the project itself.

24 Q. Are there any public roads between a wind turbine
25 and a receptor?

1 A. I -- I don't know. I haven't evaluated it.
2 Probably, but I don't know.

3 MS. REISS: Nothing further. Thank you.

4 MR. DE HUECK: Commissioners, any -- you're
5 good?

6 Okay. With that, that concludes this witness's
7 testimony.

8 Mr. Anderson, you may step down. Thank you very
9 much.

10 (The witness is excused.)

11 MR. DE HUECK: And I'm going to look at Cheri
12 and assume she needs a break. She's been at it for an
13 hour.

14 We'll come back and, say, 10 minutes. It's
15 10:30 now so that would be 10:40.

16 (A short recess is taken.)

17 MR. DE HUECK: Welcome back. Prevailing Winds,
18 EL18-026, is back in session. We need to get our webcast
19 going.

20 EL18-026, In the Matter of Prevailing Wind Park,
21 LLC for a Wind Facility Permit is back in session. We
22 just took a quick recess. And Prevailing Winds is early
23 in its case in chief, and you may call your second
24 witness.

25 MS. AGRIMONTI: Thank you. The Applicant calls

1 Dr. Mark Roberts.

2 Dr. Mark Roberts,
3 called as a witness, being first duly sworn in the above
4 cause, testified under oath as follows:

5 DIRECT EXAMINATION

6 BY MS. AGRIMONTI:

7 Q. Dr. Roberts, could you please introduce yourself to
8 the Commission.

9 A. My name is Mark A. Roberts. I am a principal
10 scientist for a company called Exponent.

11 Q. Would you please employ an overview of your
12 education and work history?

13 A. I have an associate's degree in pre-veterinary
14 medicine, a B.S. in zoology, a master's in education,
15 master's in public health, a Ph.D. in epidemiology and
16 biostatistics, and an M.D. degree.

17 Q. Okay. What work have you done within the public and
18 safety sector?

19 A. I spent 17 years in the State Health Department in
20 Oklahoma, started out doing infectious diseases and then
21 began to do environmental issues involving the state of
22 Oklahoma and citizens within the state. Things like
23 Superfund sites, hazardous waste spills, all those sorts
24 of things. Air pollution.

25 During that time I finished my medical degree and

1 moved to the Medical College of Wisconsin in Milwaukee
2 where I was on the faculty at the Medical College of
3 Wisconsin, Department of Permitting Medicine for nine
4 years, doing teaching, teaching medical students, and
5 also had a clinical practice. I was a clinic physician
6 for seven different companies during that time.

7 And then I became enamored with going out into the
8 "real world" and went to work for a company called Amoco
9 that was later sold to BP. I worked there five or six
10 years, packaged out, tried to retire and went to work for
11 a company called Exponent. So I've been at Exponent for
12 the last 14 years, working my 15th year now, basically
13 putting all the experience together, the public health
14 experience, the teaching, and the working internationally
15 for a large corporation.

16 Q. Did you file Prefiled Supplemental Direct Testimony
17 in this matter?

18 A. I did.

19 Q. And is that Prefiled Direct Testimony in front of
20 you labeled as A4 and A4-1 through 4-8 with exhibits?

21 A. It is.

22 Q. Did you also file Rebuttal on September 26 of this
23 year?

24 A. I did.

25 Q. And is that Exhibit A5 and A5-1 through 11 with

1 exhibits also before you?

2 A. Yes, it is.

3 Q. Could you please provide a brief summary of the
4 topics covered in your Supplemental Direct Testimony?

5 A. Well, basically my first point that I cover is about
6 what we know about wind turbines and health effects. And
7 in summary is there's no peer-reviewed published
8 literature. The body of knowledge involving
9 peer-reviewed published literature does not indicate that
10 there's a specific adverse health effect as a result of
11 being exposed to wind turbines.

12 Number two is the fact I -- I talk about the fact of
13 how the -- the scientific method of how that would be
14 determined and how we came to those conclusions.

15 Number three is I'm struck by the case reports that
16 are often depended upon in talking about wind turbines
17 and health effects and talk about the fact that case
18 reports and case series are not epidemiological studies.

19 And then, finally, talking about the number of
20 state -- I'd back up and say local, state, national, and
21 international organizations that have reviewed the
22 literature and come to the same conclusion that I have.

23 So that's basically a summary of what I'll talk
24 about.

25 Q. All right. And in your Rebuttal Testimony, what

1 were the topics you covered in that prefiled testimony?

2 A. Well, that brought up a number of issues that
3 other -- others had covered in their testimony.
4 Specifically a condition called -- referred to as
5 vibroacoustic disease, VAD.

6 And then there were also discussions by Dr. Punch
7 and Dr. James concerning noise levels and possible health
8 effects.

9 Q. What was your Rebuttal Testimony with respect to
10 VAD?

11 A. My testimony is that VAD was reported by a series
12 of -- a group of researchers in Portugal. It's been --
13 they've published a number of papers on it.

14 It has not been recognized as a disease by any other
15 group and has not been listed as -- in the diagnostic
16 categories that physicians use in coding different
17 diseases. And I find the science not to be there to
18 support their conclusions.

19 Q. And with respect to Dr. Punch, what was your
20 response?

21 A. Well, Dr. Punch makes a number of claims about
22 health effects. And these are primarily based on case
23 reports. And also about the validity or information used
24 in terms of collecting case report information.

25 Q. Just to follow up, you noted that case reports have

1 a different level of value and scientific knowledge.

2 Can you please explain a little bit more about case
3 reports?

4 A. Absolutely. The literature or -- it's kind of hard
5 anymore to publish about a case report. But a case
6 report is really a scientist's way of putting it out,
7 hey, I just observed this. Have you seen it? What have
8 other people seen?

9 Part of that is due to get funding and other
10 additional research. So case reports are merely a
11 person's reporting their observations. And it's not an
12 epidemiological study. It's merely putting it out there
13 that I've seen this. Has anybody else seen something
14 like this, and what does the science tell us?

15 Q. Lastly, with respect to Mr. James, what was your
16 Rebuttal Testimony?

17 A. Mr. James again talks about the infrasound and
18 hearing and makes some assumptions about how these -- the
19 noise affects individuals.

20 Q. And do you agree with his conclusions?

21 A. No, I don't.

22 Q. All right. And have you also reviewed the
23 literature regarding health effects and wind turbines
24 cited in the testimony of Mr. James, Dr. Punch,
25 Dr. Alves-Pereira?

1 A. I have. I've looked at a considerable volume of
2 information. But what I was struck with is the fact that
3 the number of local, state, and national organizations or
4 groups that have been impaneled to review the information
5 came up with similar results. As I --

6 You know, I have a number of exhibits that talk
7 about or that give examples of this from Wisconsin, from
8 Minnesota, from Massachusetts. Then, internationally,
9 Canada, Germany, Japan, France, New Zealand.

10 So it's been looked at, and there is a consensus
11 that's been developed around it that there's not
12 sufficient evidence to indicate there's an adverse health
13 effect associated with wind turbines.

14 They do talk about annoyance, and we can talk more
15 about annoyance as the questions come up.

16 Q. All right. Was there anything in the literature
17 that these three witnesses attached to their testimony
18 that would cause you to change your opinions?

19 A. No.

20 Q. Did you also review Intervenors' Exhibit I-25, which
21 has several sub Exhibits A through F? Again, those were
22 marked for Professor Alves-Pereira?

23 A. Yes, I did.

24 Q. And do you have any response to those exhibits?

25 A. Two of them or maybe -- I'd have to look at them

1 again to refresh my memory, but they were case reports.
2 And, like I say, quite a varied description. Not only of
3 the symptoms but also of possible exposures to sounds in
4 general.

5 There's also one about a protocol for diagnosing
6 VAD, I recall. And I was struck. Number one is it was
7 published at a time when it's clearly not been accepted
8 by the medical community.

9 But number two is 27 -- I think 27 out of 31 of the
10 references all goes back to that research group. In
11 other words, they didn't quote other researchers as
12 supporting what they were talking about.

13 Q. And, again, there's nothing in there that changes
14 your conclusions?

15 A. No, there's not.

16 Q. All right. Were you here this morning when there
17 were questions regarding shadow flicker and health
18 effects?

19 A. Yes, I was.

20 Q. And there was also some testimony regarding standard
21 in the industry with respect to shadow flicker levels.

22 Do you remember that as well?

23 A. That's true.

24 Q. Do you have a response to the testimony that you
25 heard this morning?

1 A. Number one is there was a lot of talk about shadow
2 flicker. I think that to back up for a minute and talk
3 about it, is flicker, light flicker in general.

4 We are surrounded by light flicker. This monitor in
5 front of me right now is flickering at probably about
6 75 hertz. The lights above us, if they're florescent,
7 are probably about 125 hertz.

8 What I know about wind turbines is the fact that
9 they range in a flicker of between .5 and probably 1,
10 1.5 hertz maybe max, depending on how fast they're
11 spinning.

12 So it's really one of there certainly are health
13 effects associated with flicker at different frequencies
14 but not at the frequency that -- the very, very low
15 frequency that wind turbines produce.

16 Q. All right. Are you aware of any basis for the
17 30 hours per year of shadow flicker that Mr. Anderson
18 talked about?

19 A. No, I don't. I have seen it on occasion. I've seen
20 it in the literature internationally. I have not seen a
21 consensus of its acceptance. I've seen it applied on
22 occasion.

23 If I'm asking about a wind turbine project, I ask if
24 there is a flicker requirement in the state or
25 jurisdiction where it's happening. But I'm not aware

1 that it's been addressed nationally -- federally for
2 sure. And not every state has it.

3 Q. Do you have any additions or corrections to your
4 prefiled testimony?

5 A. No, I don't.

6 Q. And if I asked you the same questions today, would
7 your answers be the same?

8 A. Yes, they would.

9 MS. AGRIMONTI: Dr. Roberts is available for
10 cross-examination.

11 MR. DE HUECK: Mr. Almond, your witness.

12 CROSS-EXAMINATION

13 BY MR. ALMOND:

14 Q. Dr. Roberts, when did you first start looking into
15 wind turbines?

16 A. Probably about 2011, 2012, something like that.

17 Q. And how is it that you came to start looking into
18 wind turbines?

19 A. I was asked to look at a wind turbine project up in
20 Wisconsin, I believe, at that point. Sometime along
21 about that time frame.

22 Q. And were you -- who hired you to look into the
23 Wisconsin project?

24 A. I think it was an energy company -- it was an
25 energy company in Wisconsin, and I don't recall the name

1 of it.

2 Q. Was that energy company looking to develop? Had
3 they already developed a project? What was going on?

4 A. I think they were going through the permitting
5 process.

6 Q. Okay. And what were you asked to look into for that
7 project?

8 A. I was asked to look at the science of are there
9 health effects associated with wind turbines in the
10 peer-reviewed, published literature.

11 Q. And how many times have you been hired by an
12 energy company to provide opinions about the health
13 effects of wind turbines?

14 A. I don't count that. It's not something I track. I
15 would say something probably around between 15 and 25
16 times.

17 Q. Have you ever provided any opinions that are
18 unfavorable to a wind or energy company?

19 A. As far as the science area, no.

20 Q. And I assume you're being compensated for your time
21 here today?

22 A. Yes.

23 Q. And how much --

24 A. The company will be. The company gets paid for my
25 time. I'm an hourly employee.

1 Q. And how much is the company charging?

2 A. The company bills my rate of 585 an hour.

3 Q. All right. I want to talk a little bit about your
4 educational background. So if you want to turn to
5 Exhibit A4-1, feel free to. It's your CV or statement of
6 qualifications. If you don't need to rely on it, that's
7 fine too.

8 A. If you're going to ask me dates, I'll have to go
9 back and look. It's been a long time ago. Go ahead, And
10 I'll turn pages as you ask the question.

11 Q. Yep. I was looking through the education section,
12 and I noticed there isn't anything in there regarding the
13 study of acoustics; correct?

14 A. Study of what?

15 Q. In your education there wasn't anything in there
16 regarding the study of acoustics; correct?

17 A. Other than the fact of as an occupational medicine
18 physician, hearing conservation is extremely important in
19 most of the industries that I've dealt with. So the
20 hearing conservation, testing of hearing, and that sort
21 of thing I dealt with on a daily basis when I was in
22 clinical practice.

23 Q. And I'm asking about your education section. Have
24 you received any formal education in the field of
25 acoustics?

1 A. During residency about hearing conservation, hearing
2 testing, that sort of thing. So that would be acoustics.

3 Q. During your medical residency?

4 A. During medical residency. That's correct.

5 Q. How long were you in residency?

6 A. Three years.

7 Q. Why don't you flip to the first page of your CV
8 there for me.

9 A. I'm there.

10 Q. And looking at that education section. Have you
11 received any formal education regarding noise?

12 A. Again, as a -- in my residency training and
13 occupational environmental medicine, that's about noise.

14 Q. And low frequency noise, was that covered in the
15 same residency?

16 A. Noise in general is covered during that. So I don't
17 recall specifically about low frequency noise. It was
18 just about noise in general in the occupational setting.

19 Q. Do you recall if -- anything about infrasound?

20 A. Not specifically, no.

21 Q. Let's go to your publication list in your CV. In
22 reviewing that I saw there was one publication that dealt
23 with wind turbines; is that right?

24 A. That is correct.

25 Q. And this list of publications, are those all peer

1 reviewed?

2 A. They are.

3 Q. Okay. And that publication, that peer-reviewed
4 publication about wind turbines, what was the name of
5 that?

6 A. I have to go back and read it to be -- it's 2013.

7 Q. Was it Wind Turbines: Is There a Human Risk?

8 A. That sounds correct. I haven't found it on my list
9 yet so --

10 Q. It's on page 5 of your CV there.

11 A. That is correct.

12 Q. And that's the only peer-reviewed paper that you've
13 published about wind turbines; correct?

14 A. That is correct.

15 Q. Did any of your other peer-reviewed publications
16 look at noise?

17 A. Not that I recall.

18 Q. So I assume they didn't look at low frequency noise
19 or infrasound either?

20 A. That is correct.

21 Q. Any of them look at acoustics at all in any of those
22 other peer-reviewed publications?

23 A. Not that I'm aware of.

24 Q. So I've reviewed all the exhibits you've submitted
25 along with your testimony, and I noticed your lone

1 publication about wind turbines was not included as an
2 exhibit; is that correct?

3 A. That is correct.

4 Q. Is the document I just handed you your loan
5 publication about wind turbines?

6 A. That is my 2013 publication about wind turbines.
7 That's correct.

8 Q. And a large part of the questions I'm going to ask
9 you about that I'm going to be referring to that
10 publication.

11 MR. ALMOND: So at this point I think it would
12 be appropriate for the Commission to have a copy of that
13 in front of them. So I would move for the admission of
14 Exhibit I-35.

15 MS. AGRIMONTI: No objection.

16 MR. DE HUECK: It will be admitted.

17 (Exhibit I 35 is marked for identification.)

18 Q. All right. Let's step back a little bit. You're an
19 epidemiologist; correct?

20 A. That is correct.

21 Q. You'd agree you're not an expert in acoustics?

22 A. No, sir.

23 Q. You agree you're not an expert in noise?

24 A. Acoustics is noise.

25 Q. So no?

1 A. So the answer is still no.

2 Q. Okay. Now in your career with respect to wind
3 turbines and health effects have you conducted any
4 experiments?

5 A. No, I have not.

6 Q. Okay. Have you collected or analyzed any data
7 produced from any experiments?

8 A. Other than what's in peer-reviewed, published
9 literature, no.

10 Q. And have you examined any individuals who have
11 claimed to be experiencing negative health effects caused
12 by wind turbines?

13 A. Not as a physician, no.

14 Q. I assume you haven't treated any individuals either?

15 A. Well, at hearings and that sort of thing we hear
16 testimony about health concerns and that sort of thing,
17 so I'm sitting there as a physician evaluating that.

18 Q. So you have treated individuals?

19 A. I said no, I have not.

20 Q. Okay. And, again, I assume you haven't performed
21 any medical tests on any individuals who are claiming
22 adverse health effects caused by wind turbines?

23 A. No, I have not.

24 Q. Okay. So is it fair to summarize your experience in
25 this field as just reviewing the literature that existed

1 out there and forming conclusions or opinions about what
2 the literature says?

3 A. Among other things. And also listening to testimony
4 such as this, talking to various experts who have
5 testified at hearings like this before and after the
6 hearings. So that combination.

7 Q. Okay. And let's just briefly go through your
8 exhibits quickly that you included with your testimony.

9 If you go to Exhibit A4, page 3, you have them all
10 listed there.

11 A. Okay. Page 3. I'm there.

12 Q. You there?

13 Exhibit 2, the Australian National Health and
14 Medicine Research Council, 2010. Do you see that
15 exhibit?

16 A. I think --

17 Q. Or the reference to the exhibit?

18 A. On this page? On page 3 of A4?

19 Q. Correct.

20 Our pages are off. What page do you first start
21 listing your exhibits in your --

22 A. That would be -- in mine it's page 4 of 21,
23 Exhibit A4 at the bottom.

24 Q. And what are the line numbers?

25 A. Exhibit 1 is line 86.

1 Q. And do all the exhibits go through line 121?

2 A. Correct.

3 Q. All right. We've got the same line numbers then.

4 A. Okay.

5 Q. So Exhibit 2 on line 87, Australian National Health
6 and Medical Research Council, was that a peer-reviewed
7 study?

8 A. I believe it was.

9 Q. What about Exhibit 2A?

10 A. Those are all a series of reports that came out of
11 Australia. I believe they were all produced by the
12 Adelaide University for the National Health and Medical
13 Research Council of Australia.

14 Q. And let's go to Exhibit 3 there on line 100. Was
15 that peer reviewed?

16 A. Exhibit 3. The French study?

17 Q. Yeah.

18 A. This was a national panel that was put together to
19 advise the French National Agency For Food Safety and
20 Environmental and Labor, I think. And so I'm not sure
21 that that was peer reviewed.

22 That would be considered grey literature produced by
23 the government. So it would have value as far as
24 reviewing the data that we have.

25 Q. So in all of that was the answer no to my question

1 when asking was that peer reviewed?

2 A. I think I can't answer that yes or no in the fact
3 that they used peer-reviewed literature to come to their
4 conclusions.

5 Q. But you don't know whether or not that study, that
6 French study, was peer reviewed?

7 A. I do not know whether it was described as peer
8 reviewed or not.

9 Q. All right. Exhibit 4, that Wisconsin Wind Siting
10 Council, 2014, was that a peer-reviewed publication?

11 A. Again, this is a review of the peer-reviewed
12 published literature. I do not know the state's process
13 before that is produced.

14 Q. So you don't know whether or not Exhibit 4 was peer
15 reviewed?

16 A. I know that they used peer-reviewed literature to
17 come to their conclusions, but I do not know the process
18 for its publish.

19 MR. ALMOND: Mr. de Hueck, I think we're going
20 to be here for a long time if the witness doesn't just
21 answer the questions that are asked.

22 MR. DE HUECK: Okay. If you don't know if it's
23 peer reviewed, just say I don't know if it's peer
24 reviewed.

25 MS. AGRIMONTI: I think the problem is the

1 question is more complex, or the answer is more complex.
2 And I think that Dr. Roberts has attempted to explain the
3 nuance of a government publication having reviewed and
4 relied upon peer-reviewed articles but maybe not having a
5 peer-reviewed process itself.

6 MR. DE HUECK: Absolutely understood. But it
7 all boils down to he can't answer whether or not it's
8 peer reviewed.

9 So it looks like Reece is going to go through
10 all of these. So if there's a long process to
11 determining whether it is but ultimately he doesn't know
12 if it is, let's just say we don't know if it is.

13 Q. Dr. Roberts, Exhibit 5, the Rand and Hoen study from
14 2017, is that a peer-reviewed publication?

15 A. Based on the instructions that I've just been given,
16 I do not know.

17 Q. And Exhibit 6, the Public Service Commission of
18 Wisconsin, is that a peer-reviewed publication?

19 A. Based on the instructions I've been given, I can't
20 answer yes to that.

21 Q. And Exhibit 7, the Massachusetts Department of
22 Environmental Protection Study, I think it's often
23 referred to as the Massachusetts Study from 2012, was
24 that a peer-reviewed publication?

25 A. I believe it is. I can't answer definitive yes or

1 no.

2 Q. Let's turn to your Rebuttal Testimony and look at
3 the exhibits that you attached to your Rebuttal
4 Testimony.

5 Are you there?

6 A. I'm there.

7 Q. And it looks like Exhibits 1 through 11; correct?

8 A. Correct.

9 Q. And I'll try to speed this up. Which of those
10 exhibits do you know are peer-reviewed publications?

11 A. We start at the bottom. Exhibit 11, 10, 9. I
12 believe that's the only ones I can testify for sure were
13 peer reviewed.

14 Q. Now I want to talk a little bit about the opinions
15 you're offering in this case. And you summarize them at
16 the beginning. And my notes were that you said your
17 opinion was you viewed the peer-reviewed literature --
18 your opinion was that no peer-reviewed study shows
19 adverse health effects.

20 Is that a fair summary of your opinion?

21 A. I said a review of the peer-reviewed literature did
22 not indicate there was a specific disease entity
23 associated with wind turbines.

24 Q. Has the peer-reviewed literature concluded that wind
25 turbines, whether it be noise, flicker, what have you,

1 does not cause adverse health effects?

2 A. It has not because the science can't prove the
3 negative.

4 Q. Now you understand, I assume, that one concern that
5 the Intervenors have with respect to this project is that
6 the audible noise that it creates is going to interfere
7 with their sleep.

8 You understand that's one of the concerns of the
9 Intervenors?

10 A. I have heard that concern, and I have read it in the
11 material that's been provided. That's correct.

12 Q. And would you agree with me that chronic sleep
13 disturbance has a negative effect on a person's health?

14 A. It can under some circumstances.

15 Q. It creates problems in mood?

16 A. Once you get into the -- what causes the sleep
17 disturbance, that can affect the psychological part.
18 Mood is part of the psychological part.

19 Q. Problems with cognition?

20 A. It's possible. I'm not a sleep expert. There's
21 going to be a sleep expert that will testify later that
22 can testify about sleep.

23 Q. So at any time in your residency, your education did
24 you ever look at the health effects of sleep?

25 A. In medical training we often thought about the lack

1 of sleep. But certainly there is disruption of sleep can
2 affect one's performance. That's correct.

3 Q. So if this project were to create chronic sleep
4 disturbance in those who live around it, wouldn't you
5 agree that it would cause an adverse health effect on
6 those individuals?

7 MS. AGRIMONTI: Objection. Assumes facts not in
8 evidence.

9 MR. ALMOND: May I respond?

10 MR. DE HUECK: You may.

11 MR. ALMOND: This is an expert qualified to
12 answer hypothetical questions.

13 MR. DE HUECK: Can you ask your question again,
14 please.

15 MR. ALMOND: Cheri, can you reask the question.

16 (Reporter reads back the last question.)

17 MR. DE HUECK: I'm going to sustain the
18 objection, and that sounds like speculation on facts that
19 aren't in the record.

20 MR. ALMOND: Just so I'm clear on the order, are
21 you saying that the witness cannot testify to
22 hypotheticals?

23 MR. DE HUECK: Just that particular question
24 you're asking him to speculate on a what-if what-if, and
25 we have nothing saying that's going to happen.

1 MR. ALMOND: Do I need to appeal this to the
2 Commissioners to get a formal ruling?

3 MR. DE HUECK: No. They can overrule me but so
4 far it stands. And I haven't heard anything. But
5 they'll definitely step on my toes if I've done
6 something --

7 COMMISSIONER NELSON: Let's just take a short
8 time.

9 (Pause.)

10 MR. DE HUECK: Quick recess.

11 (A short recess is taken.)

12 MR. DE HUECK: Mr. Roberts, I'm going to change
13 my ruling. I'm going to direct you to go ahead and
14 answer Mr. Almond's hypothetical question. Mr. Almond --

15 Or maybe, Cheri, would you please read it again.

16 (Reporter reads back the last question.)

17 A. This hypothetical that I've been presented with, one
18 of the things you have to dissect out is the fact of the
19 human response to something they don't like or they have
20 a feeling about. We'll talk about placebo and nocebo
21 effect probably a little bit later.

22 But the point being that they're reacting to the
23 events, not necessarily to the sound. And so reaction to
24 the events. Waking up and hearing the sound of wind
25 turbines would like -- likely they would associate that

1 with the wind turbines but the fact that wind turbines
2 were not what woke them up.

3 Q. So you agree that chronic sleep disturbance can have
4 negative health effects in individuals; correct?

5 A. I do.

6 Q. Do you agree if something is going to cause negative
7 health effects in individuals, that the thing that causes
8 the negative health effects is going to cause the adverse
9 health effects?

10 A. If they know what it is.

11 Q. Okay. So if any wind project causes adverse
12 health -- or excuse me.

13 If any wind project causes chronic sleep disturbance
14 in a particular individual or a group of individuals,
15 wouldn't you agree that that project is causing the
16 adverse health effects?

17 A. Only if you specify that it's their reaction to the
18 wind project, their emotional reaction and physical
19 reaction to it.

20 Q. Right. If the project is causing them to have
21 chronic sleep disturbance, the project is causing the
22 adverse health effects; right?

23 A. If their psychological -- their evaluation of the
24 project -- any noise, if they are concerned about that,
25 that could be associated with them having sleep

1 problems.

2 Q. And if they have chronic sleep problems, they're
3 likely to have adverse health effects?

4 A. Right. And it's partly as a result of their
5 response to that stimuli.

6 Q. Now isn't it true that the epidemiological studies
7 indicate that noise and/or vibration from wind turbines
8 has been noted as causing sleep disruption?

9 A. They say -- what they're reporting is that it is
10 associated with it. As far as the cause, again, I go
11 into the point they have not evaluated whether it's the
12 noise itself or the person's response, emotional
13 response, to hearing that sound.

14 Q. Let's look at the Massachusetts study that you
15 referenced. I believe it's Exhibit A4-7. And if you
16 turn to page 50 of that exhibit, please.

17 A. Page 50?

18 Q. Correct.

19 A. I'm there.

20 Q. And the bottom of page 50 there, there's a
21 heading, Impact Of Noise From Wind Turbines On Sleep.

22 Do you see that heading?

23 A. On page 50?

24 Q. Page 50 of the exhibit. These page numberings are
25 going to be tricky for us.

1 A. Pardon me. Let me go backwards.

2 I'm there.

3 Q. So on the very bottom of that page there's a
4 heading, Impact Of Noise From Wind Turbines On Sleep. Do
5 you see that heading?

6 A. I do.

7 Q. And read along with me as I read this out loud.

8 "The epidemiological studies indicate the noise
9 and/or vibration from wind turbines has been noted as
10 causing sleep disruption."

11 Did I read that correctly?

12 A. That's what it says.

13 Q. This is a study you cited to support your opinions;
14 correct?

15 A. That is correct.

16 Q. And even -- I think even the Intervenors would agree
17 that when sited appropriately, a wind turbine or a wind
18 farm is not going to create sleep disturbances. But if
19 sited inappropriately, there's a high likelihood of it
20 causing sleep disturbances.

21 Would you agree with that?

22 A. Partially I agree with it. That's not the whole
23 answer, but that's part of it.

24 Q. So when sited improperly wind turbines or wind farms
25 do have the ability to cause sleep disturbances. Would

1 you agree with that?

2 A. You'd have to define "improperly" to me. Because
3 that's a general term. And one of the points is improper
4 may be in the eyes of the person reporting symptoms. So
5 they may think it's inappropriately sited, but it's their
6 response to it.

7 Q. Yeah. I appreciate -- I'll ask it a little
8 differently.

9 Do you agree that wind turbines can cause sleep
10 disruption?

11 A. The association of wind turbines and the emotional
12 response to it can, yes.

13 Q. I mean, we just read in this Massachusetts study
14 that the epidemiological studies indicate that the noise
15 and/or vibration from wind turbines has been noted as
16 causing sleep disturbance.

17 Are you now somehow trying to distinguish those
18 epidemiological studies or --

19 A. Well, then I'd go ahead and read this next sentence
20 in that section. It says, "In addition, suggestions are
21 provided for more definitive evaluation of the impact of
22 wind turbines on sleep."

23 Q. So back to the original question, do you agree that
24 wind turbines can disrupt sleep?

25 A. Emotional response to it can certainly do it.

1 Q. What about aside from emotional response?

2 A. I'm not a sleep expert so I wouldn't be able to
3 answer all the things that go into sleep disturbances.

4 Q. But you have reviewed the epidemiological studies;
5 correct?

6 A. I've reviewed the epidemiological studies of wind
7 turbines and their proposed effects.

8 Q. And the epidemiological studies indicate that the
9 noise and/or vibration from wind turbines has been noted
10 as causing sleep disturbance; correct?

11 A. In this one study that's a statement that is made.

12 Q. And this study, didn't it go on to find that because
13 of the potential of causing effects -- causing of
14 effects, wind turbines should have certain siting
15 recommendations?

16 A. I don't recall that. If you could point that out to
17 me, I'd be glad to look at it.

18 Q. Yeah. Let's go to page 80 of Exhibit A4-7.

19 A. Okay.

20 Q. Actually, 79 it starts.

21 A. Their page 60. Our page --

22 Q. Our exhibit page number 79 of 164.

23 A. Got it.

24 Q. Section 5.1, Noise.

25 Doesn't this section talk about recommendations for

1 limiting the noise created by wind turbines?

2 A. It appears to, yes.

3 Q. Uh-huh. And if you look at Table 4, it talks
4 about -- do you see Table 4 on page 80?

5 A. I do.

6 Q. Labeled as Promising Practices For Nighttime Sound
7 Pressure. And then for residential areas it looks like
8 it has a range of 37 to 39 dBA.

9 Do you see that?

10 A. I do.

11 Q. And then if you go on page 80 there, the second
12 paragraph from the bottom that reads, "The panel
13 recommends that noise limits such as those presented in
14 the table above be included as part of a statewide policy
15 regarding new wind turbine installations."

16 Did I read that correctly?

17 A. You did.

18 Q. So isn't this Massachusetts study basically saying
19 to avoid adverse effects caused by noise, we should site
20 them in accordance with these noise limitations?

21 A. Well, number one, it says the panel recommends it.
22 And I think that the other thing you have to consider is
23 the fact that I don't know exactly how these numbers
24 should be interpreted because the WHO recommendation of
25 40 is averaged over a year.

1 I don't have any idea, and it doesn't tell me in
2 this, if this is averaged over a year. That's one of the
3 problems, I think, that is certainly something to
4 consider. But you've got to be more specific in what the
5 numbers mean.

6 Q. No. I appreciate that. So let's talk about what
7 the panel did recommend. And this is the panel that you
8 cited to as support for your opinions; correct?

9 A. That's correct.

10 Q. And it says, "The panel recommends those noise
11 limits as presented in the table above," referring to
12 Table 4; right?

13 A. That is correct.

14 Q. And if you read under Table 4, that first
15 paragraph -- or the paragraph below Table 4, those are
16 actually based off of Denmark's noise limits, aren't
17 they?

18 A. That is what it says. That's correct.

19 Q. And those are calculated over a 10-minute period.

20 A. Right.

21 Q. So the panel recommends those noise limits, 37 to
22 39, over a 10-minute period.

23 A. It doesn't say that in the table.

24 Q. Well, certainly the Commission can read the
25 paragraph below the table to see what's -- information is

1 included in the table; correct?

2 A. I certainly think so.

3 Q. Let's move away from audible noise now and talk
4 about infrasound and low frequency noise.

5 In reading your testimony, do you group them
6 together, infrasound and low frequency noise?

7 A. You know, the literature, you've got to be careful
8 in the fact of -- read the literature carefully whether
9 they're talking about low frequency or infrasound.

10 But in general anything below like 20 hertz you
11 can't hear unless you really push up the sound pressure,
12 the decibels. You crank up the volume. So I would
13 include those together.

14 Q. In fact, infrasound is a subset of low frequency
15 noise; right?

16 A. You've just got to be careful and make sure what the
17 author's -- how they're defining it.

18 Q. Okay. And you understand that another concern that
19 the folks up here have is that the infrasound or the low
20 frequency noise generated by wind turbines is going to
21 cause adverse health effects.

22 You recognize that as a concern that they have;
23 correct?

24 A. I recognize that as a concern of theirs. Correct.

25 Q. So I want to look at the opinions that you've

1 offered in this matter on infrasound. And on Exhibit A4,
2 line 472, I'll go ahead and quote your opinion. If you
3 want to flip to it, you're welcome to, or you can trust
4 that I quoted it correctly.

5 "I am not aware of any reliable evidence providing
6 any link between infrasound and adverse health
7 effects."

8 Is that an opinion you're offering in this matter?

9 A. The only thing I would add is it's at the levels
10 we're talking about with wind turbines.

11 Q. Sorry. Can you repeat that?

12 A. I would add I agree with that statement, but I would
13 clarify it for the Commission that it would be at the
14 levels that we -- that are associated with the operation
15 of wind turbines.

16 Q. Let's take a look at your Rebuttal Testimony on
17 Exhibit A5, page 10.

18 A. A5?

19 Q. Correct.

20 A. Okay.

21 Q. I'm actually talking about line 277, in case our
22 page numbers are --

23 A. Got it. 277.

24 Q. In your rebuttal you say, "Put simply, adverse
25 health effects have not been linked to infrasound

1 generally or to infrasound generated by wind turbines,
2 more specifically."

3 So you're actually opining more generally than just
4 the infrasound sound caused by wind turbines; correct?

5 A. That's correct.

6 Q. And those are the opinions you want the Commission
7 to rely on because those are included in your testimony;
8 right?

9 A. Correct.

10 Q. Now if you'd refer to Exhibit I-35 for me, please,
11 this is your peer-reviewed publication.

12 A. Oh. Oh, okay. All right.

13 You referred to this as I what?

14 Q. I-35.

15 If you go to page 4 of I-35 for me, it looks like
16 you have a section devoted to research on human health
17 effects and low frequency sound.

18 Do you see that?

19 A. At the bottom of the page. That is correct.

20 Q. And it looks like that section of your paper
21 stretches from pages 4 over to 5, and that section ends
22 on page 6; right?

23 A. It appears to, yes.

24 Q. So let's look at page 4 first. It starts off with,
25 "Low frequency sound is often accompanied by vibrations.

1 High levels of low frequency sound at a frequency of
2 50 to 80 hertz can excite body vibrations."

3 Do you agree with the findings of those studies you
4 cite in your peer-reviewed paper?

5 A. I do. That's a vibration, yes.

6 Q. And the next sentence, "These chest wall and body
7 hair vibrations have also been shown to occur in the
8 infrasonic range."

9 Do you agree with the findings of that study?

10 A. Yes.

11 Q. And the next two sentences, "Human tendency often
12 occurs to confuse vibration with sound on its own,
13 resulting in people hearing more sound than is actually
14 present."

15 Do you agree with that finding?

16 A. I do.

17 Q. And, likewise, the reverse has been shown to occur
18 as evidenced by the association found between motion
19 sickness and low frequency sound even without
20 accompanying vibration.

21 Do you agree with that finding?

22 A. That is correct.

23 Q. Okay. And it looks like you reference vibroacoustic
24 disease in this publication; right?

25 A. I do.

1 Q. And you disagree with the findings of that study you
2 have referenced here in your peer-reviewed publication
3 regarding vibroacoustic disease?

4 A. I disagree with the publications about vibroacoustic
5 disease, yes. And a majority of it. Every publication
6 has points I might disagree with. So there's -- I'm not
7 going to say that there's not something that's been
8 published about vibroacoustic disease that I don't agree
9 with.

10 Q. Let's go to page 5, the third paragraph down there.
11 "Studies have shown changes in heart rate in subjects
12 that were exposed to low frequency sound."

13 A. I'm confused about the paper that you're -- I can't
14 follow based on your number. I see numbers at the bottom
15 1 through 17.

16 Q. Correct.

17 A. Okay. I tried to follow that, and I can't. Which
18 one are you -- which one are you on?

19 COMMISSIONER NELSON: I would concur. We're not
20 following up here either. So if you could help us out,
21 Mr. Almond.

22 MR. ALMOND: Sorry about that.

23 Q. All right. So I'm on page 4. The paragraph
24 starting out with "Cardiovascular and respiratory
25 effects."

1 Do you see that paragraph?

2 A. We're on the same page. I do.

3 Q. Excellent.

4 And you reference a study there. "Studies have
5 shown changes in heart rate in subjects who were exposed
6 to low frequency sound."

7 A. From that publication -- those publications. That's
8 correct.

9 Q. Yep. Do you dispute what those studies showed? Do
10 you dispute the findings of those studies?

11 A. No, I don't.

12 Q. Okay. And then the next paragraph talks about a
13 study that, "Subjects reported aural complaints after
14 exposure to industrial infrasound below 20 hertz".

15 Do you see where I'm at there?

16 A. I do.

17 Q. First of all, what are aural complaints? Am I
18 pronouncing that right?

19 A. You are. And that can be complaints of a sensation
20 of movement, of visualization, that sort of thing. You
21 hear in migraines you have an aura before the migraine
22 headache occurs.

23 And this would be common because if you go back up
24 one sentence above that, we're talking about they bring
25 in the fact that when you're talking about low frequency

1 noise and symptoms, these are talking about -- clarifying
2 that sentence that we're talking about 150 to 154
3 decibels.

4 And I think it's really, really important to
5 understand the sound pressures that we're talking about
6 when these symptoms occur.

7 Q. So you added the 150 to 154 decibels there?

8 A. Yeah. In the previous paragraph where you're
9 reading about cardiovascular respiratory?

10 Q. And we're referring to different studies in that
11 next paragraph. The Karpova study and the Slarve and
12 Johnson study; right?

13 A. Karpova is K-A-R-P-O-V-A.

14 What I'm saying is you have to keep in mind when you
15 talk about low frequency sound you have to keep in mind
16 the sound pressure that's being -- that they're
17 measuring. And actually this came up during the Apollo
18 astronaut training because of the low frequency sound
19 levels associated with liftoff and the rocket -- riding a
20 rocket up as an astronaut and the feelings that you get
21 at those high sound pressures.

22 Q. So you're saying the Karpova study and the Slarve
23 and Johnson study include sound pressures in the 150 to
24 154 decibel range?

25 A. I'd have to go back and look and see. I suspect

1 they do.

2 Q. Okay. And staying with that same paragraph on the
3 Karpova and Slarve and Johnson studies, it talks about
4 increase in diastolic blood pressure; right?

5 A. Correct.

6 Q. And a decrease in systolic blood pressure?

7 A. That's correct.

8 Q. And significantly decreased respiration rates?

9 A. That's what it says in this paragraph. That's
10 correct.

11 Q. And the next sentence there, "Karpova and coauthors
12 reported complaints of fatigue, feelings of apathy, loss
13 of concentration, somnolence, and depression following
14 exposure to low frequency sound."

15 Did I read that correctly?

16 A. You did.

17 Q. And the last sentence there, "Furthermore, the
18 relationship between fatigue and tiredness after work and
19 increasing low frequency sound exposure was found among
20 439 employees working in offices and laboratories and
21 industries in a later study."

22 Did I read that correctly?

23 A. You read that correctly.

24 Q. So in your Rebuttal Testimony you offer the opinion
25 that adverse health effects have not been linked to

1 infrasound generally.

2 Wouldn't you agree that all of these studies we just
3 went through show a link between infrasound and adverse
4 health effects?

5 A. At the sound levels that they measured, that's
6 correct.

7 Q. The sound levels that you can't recall as you're
8 sitting here; correct?

9 A. That's correct.

10 Q. Okay. So you are aware that adverse health effects
11 are linked to infrasound?

12 A. At high levels, that's correct.

13 Q. And, in fact, why don't we go to your conclusion of
14 this peer-reviewed publication that you authored.

15 And it starts off saying, "The answer to the
16 question of whether or not exposure to wind turbine sound
17 is a human health risk is still under review and warrants
18 further research. Although limited, research has
19 demonstrated that low frequency sound can elicit adverse
20 physical health effects, such as vibration or fatigue, as
21 well as annoyance or unpleasantness response."

22 That's the opinion you offered in this peer-reviewed
23 publication; right?

24 A. At that time, that is correct.

25 Q. Let's move down to talk about infrasound

1 specifically generated by wind turbines. I want to focus
2 on your Rebuttal Testimony, page 7 -- or lines 181 to
3 228.

4 A. Okay.

5 Q. And you were asked the question about infrasound,
6 particularly that from wind turbines and its potential
7 impact on human health, and then you provide a response
8 there.

9 Lines 184 through 228. Are you with me?

10 A. Which one are we --

11 Q. Rebuttal Testimony.

12 A. Oh. Okay. A5; correct?

13 Q. Yes. Exhibit A5, lines 181 through 228.

14 A. I'm there.

15 Q. Okay. So you were asked a question about
16 infrasound, particularly that from wind turbines and its
17 potential impacts on human health. And then you provided
18 this answer; correct?

19 A. I'm not following you. A5. My line 181 is
20 question: "Professor Alves-Pereira."

21 Q. The question is --

22 A. Are you aware of any recent studies on the topic?
23 Okay?

24 Q. Yeah. On the topic of infrasound, particularly from
25 wind turbines --

1 A. All right.

2 Q. -- and its potential impact on human health.

3 A. I'm there now. Excuse me.

4 Q. Okay. And this is the answer you provided in
5 response to that question; right?

6 A. That is correct.

7 Q. And you identify, it looks like, nine studies there
8 in that first sentence in response to that question;
9 right?

10 A. That is correct.

11 Q. I want to talk about those nine studies.

12 But before doing so, you say, "Each study concluded
13 infrasound levels are multiple orders of magnitude below
14 the threshold of human hearing."

15 Do you see that?

16 A. I do.

17 Q. I mean, that's just saying people don't hear
18 infrasound; right?

19 A. That is correct.

20 Q. Is anyone here contesting that? Do you know? Have
21 you read anyone that's contesting that humans don't hear
22 infrasound?

23 A. Anyone here?

24 Q. Yeah. Have you read anything, anything you've been
25 provided that anyone's contesting that issue?

1 A. Not that I'm aware of.

2 Q. So that sentence there doesn't provide a lot of
3 value in terms of whether or not infrasound from wind
4 turbines causes adverse health effects; right?

5 A. The infrasound level produced by wind turbines,
6 that's correct.

7 Q. So let's talk about the German study from 2016. You
8 have it marked as Exhibit 1.

9 We confirmed earlier you don't know whether or not
10 it's peer reviewed; correct?

11 A. That's correct.

12 Q. You say that, "That study concluded that the
13 infrasound levels generated by wind turbines lie clearly
14 below the limits of human perception, and there is no
15 scientifically proven evidence of adverse effects in this
16 level range."

17 That was your conclusion of what the study, the
18 German study, showed; right?

19 A. That's correct.

20 Q. Let's look at that study, Exhibit A5-1. Page 12.

21 Are you with me?

22 A. Our page 12, our new page 12?

23 Q. Exhibit A5-1. Page 12 of that exhibit.

24 A. Yes. I'm there.

25 Q. There's a conclusion section. And in that section

1 it says, "It can be concluded that given the respective
2 compliance with legal and professional technical
3 requirements for planning and approval, harmful effects
4 from noise and wind turbines cannot be deduced."

5 Now, to paraphrase, isn't that sentence saying as
6 long as they're sited appropriately -- you might quibble
7 with the word "appropriate." But as long as they're
8 sited in accordance with the legal and professional
9 technical requirements, harmful effects aren't going to
10 come up; right?

11 A. It sounds reasonable, but I'm stuck. That's a
12 really generalized statement.

13 Q. Well, how would you interpret that sentence? "It
14 can be concluded that given the respective compliance
15 with legal and professional technical requirements for
16 planning and approval, harmful effects of noise from wind
17 turbines cannot be deduced."

18 What's your interpretation of that sentence?

19 A. I don't do planning of wind turbines so I don't know
20 how to interpret that. I can just say that based on the
21 knowledge that I have and the peer-reviewed published
22 literature and the reviews that have been done do not
23 indicate there's an adverse health effect associated with
24 wind turbines.

25 Q. In this German study, I mean, isn't it saying as

1 long as -- we're studying turbines that are sited in
2 accordance with the law that exists; right?

3 A. That's what they say. But I presume it's German
4 law, but I don't want to make that presumption here.

5 Q. Now it's funny you know German law. Isn't it true
6 many German state governments recommend 1,000 meter or
7 3,291-foot setback from residences?

8 A. I have not looked at the German laws.

9 Q. What about nighttime noise limits? Isn't it true
10 that Germany requires a 35, 40 dBA nighttime noise limit?

11 A. I have not looked at the German noise laws.

12 Q. I mean, to understand whether a project is going to
13 cause adverse health effects, if you're looking at all
14 those other projects that have been studied, isn't it
15 important to know how those projects have been sited in
16 order to arrive at the conclusion that they're not going
17 to cause adverse health effects?

18 A. Well, one of the things in epidemiology is you don't
19 get to choose. You don't get to generate all the data
20 you use in epidemiology. And especially in reviewing
21 such a broad event as this, as the siting -- or as the
22 use of wind energy. So some -- they're all varied.

23 But, you know, that's the first question you look
24 at: Does the data show there is an adverse health effect
25 in general? And then you can hone it down. You can

1 focus it down. That's the scientific method.

2 Q. Are you giving any opinion about whether or not this
3 project as sited, whether or not it will create adverse
4 health effects?

5 A. Partially I'm looking at it in terms of are the
6 sound levels that have been modeled, are they within the
7 limit that's been set for regulatory purposes.

8 Also to hopefully help clarify what the science says
9 about adverse health effects associated with wind
10 turbines.

11 Q. And, again, I don't think you answered the question
12 I asked you.

13 A. I'm sorry.

14 Q. Are you giving an opinion in this matter that this
15 project as it's proposed is not going to cause adverse
16 health effects?

17 A. Based on the information I have and being below
18 the -- the only limit that I have seen so far is 45. The
19 modeling indicates it's below 45 so I think it is not
20 likely to cause adverse health effects.

21 Q. Any other limits that are proposed on this project
22 that went into your analysis aside from that 45 dBA
23 limit?

24 A. I mean, obviously I looked at what was the modeling
25 for shadow flicker. Those were the -- primarily the two

1 things, health effects -- basically it's health effects.

2 Q. And I guess the requirements you focused on with
3 respect to this project were the 45 dBA and then the
4 shadow flicker requirement.

5 A. Well, I mean, there were other questions that came
6 up at various points. A hearing aid device and also I
7 think there was a question about autism.

8 Q. Right. But in terms of the requirements or the
9 restrictions placed on this project, whether it be a
10 noise restriction, a setback restriction, a shadow
11 flicker restriction, what you focused on was whether or
12 not a 45 dBA noise restriction is going to cause any
13 issues.

14 And you focused on whether or not a 30-hour-per-year
15 shadow flicker is going to cause any issues, and you
16 concluded that, no, you don't think it will; right?

17 MS. AGRIMONTI: Asked and answered. We've gone
18 around this a couple of times.

19 MR. ALMOND: I don't think he has answered the
20 question.

21 MR. DE HUECK: Go ahead and answer.

22 A. Well, that's part of it. And part of it was to
23 address the health concerns associated with the wind
24 project.

25 Q. So just so I'm clear, your opinion, is it your

1 opinion that if this project is approved at the 45 dBA
2 noise limitation, it won't cause any adverse health
3 effects?

4 A. It's not likely to. Will there be health
5 complaints? There's going to be annoyance, yes.

6 Q. And your opinion that it's not going to cause
7 adverse health effects at a 45 decibel limit is derived
8 from these studies that have analyzed wind turbine
9 projects; right?

10 A. That's correct.

11 Q. Don't you think it's important to understand what
12 the noise limitations were in those studies and that
13 those projects were being analyzed in order to place a
14 value at 45 dBA?

15 A. Well, one of the things is every project is unique.
16 So, first of all, you have to look at it and say, okay,
17 have there been scientific evidence, peer-reviewed
18 published literature that has indicated there's a health
19 effect?

20 And my analysis is there has not been that opinion.

21 Q. And one of those studies you referenced was this
22 German study. And if German wind farms are obligated to
23 be sited at, for example, 35 decibel limits and they went
24 and analyzed those farms and concluded that there's no
25 evidence of adverse health effects, how are you able to

1 take that and transfer that to a 45 dBA limit?

2 A. Because you add -- you use the accumulated
3 information about all wind farms. It's not at 35 that
4 you have a problem. Is it at 40? Is it at 45? Is it at
5 50, 55?

6 I don't get to choose what the levels are. I get to
7 look at what they've recorded. And they said in that
8 report there's no scientifically proven evidence of
9 adverse effects in these level ranges -- level range.
10 Excuse me.

11 Q. In the German study what was the level range that
12 they were measuring?

13 A. I think you told me --

14 MS. AGRIMONTI: Objection. I was going to
15 object. Asked and answered.

16 A. I think we've been talking about 35.

17 Q. Let's talk about the Japan study from 2017,
18 Exhibit A5-2. And that study found that wind turbine
19 noise is not an issue for adverse health effects; right?

20 A. That's what it says on page 4 of 11.

21 Q. And didn't that study actually when defining wind
22 turbine noise exclude infrasound?

23 A. I'd have to go back and look at it.

24 Q. Well, look at page 3 for me, please, and see how
25 they define wind turbine noise.

1 A. Where on page 3?

2 Q. I might have the page number wrong. Excuse me
3 again. I apologize.

4 Yeah. The bottom of page 3 there, "Wind turbine
5 noise should be regarded as audible sound noise when
6 discussing it."

7 We discussed earlier that infrasound was not
8 audible; correct?

9 A. That is correct.

10 Q. So when they're talking about wind turbine noise
11 they're not considering infrasound; right?

12 A. In that particular point.

13 But if you turn the page, they talk about wind
14 turbines in general. And they talk about low frequency
15 components so I would go with the -- the findings in the
16 literature that they reviewed.

17 Q. Let's turn to the Massachusetts study, A4-7.

18 A. I'm there.

19 Q. Turn to page 35 of that exhibit, please.

20 A. Exhibit page 35?

21 Q. Yes.

22 A. I'm there.

23 Q. This is talking about the human exposures to wind
24 turbines; right? Section 3.2?

25 A. Correct.

1 Q. And it talks about that they only considered four
2 peer-reviewed publications; right?

3 A. Could you point me to that spot? I haven't found
4 it.

5 Q. Yep. Sorry.

6 It's the second to the last sentence. "The process
7 identified four studies that generated peer-reviewed
8 papers on health effects of wind turbines."

9 A. That is correct.

10 Q. And then a few other nonpeer-reviewed documents.
11 And that's what this study or this section of the study
12 relied on, four peer-reviewed documents and a few other
13 nonpeer-reviewed; correct?

14 A. That is correct.

15 Q. Now of the four peer-reviewed studies that they
16 relied on, did any of those consider infrasound?

17 A. I'd have to go back and look and see.

18 Q. Well, the Pedersen 2007 study, any idea if that one
19 studied infrasound?

20 A. They studied wind turbines. I can't specifically
21 testify to what levels they measured, if they did.

22 Q. And the other two Pedersen studies, as well as the
23 Shepherd study, do you have any knowledge of whether or
24 not any of those four studies actually studied
25 infrasound?

1 MS. AGRIMONTI: Objection. Asked and answered.

2 A. They studied wind turbines. I can't tell you the
3 sound levels that they looked at.

4 Q. And then if you go on, it talks about the
5 nonpeer-reviewed studies that were looked at. Did any of
6 the nonpeer-reviewed studies look at infrasound?

7 A. I don't recall that they did.

8 Q. Okay. And when I looked at all eight of those
9 studies they analyzed noise from wind turbines using the
10 dBA metric.

11 Do you have an opinion whether or not the dBA
12 metric's appropriate for studying infrasound, or is that
13 outside of your area?

14 A. You know, I've seen it discussed. I looked at the
15 literature, and nearly all of it is based on dBA. So I'm
16 going to have to use that.

17 So I know that the dB(C) has different filters. I'm
18 most familiar with dBA, but that's -- I can't testify any
19 further than that.

20 Q. So you can't testify whether or not the dBA metric's
21 appropriate for looking at infrasound?

22 A. It can be used, but that -- I can't -- the studies
23 that have been -- the bulk of the literature right now is
24 based on dBA measures.

25 MR. DE HUECK: Say, Mr. Almond, I hate to

1 disrupt your flow. I just want to point out that it's
2 12:09, and it sounds like you're going to just keep
3 hammering away on cross.

4 Can you kind of give me an update as to where
5 you're at, when we can break for lunch?

6 MR. ALMOND: 15, 20 minutes.

7 MS. AGRIMONTI: Mr. de Hueck, may I add some
8 information to your consideration?

9 MR. DE HUECK: Yes.

10 MS. AGRIMONTI: Dr. Roberts does have to return
11 on his flight and will need to leave by 2:30 today so if
12 we need to press through, we understand, to make him
13 available live.

14 MR. DE HUECK: Cheri?

15 Again, apologies for disrupting your flow.

16 Q. Let's look at Exhibit A4-2c. It's another exhibit
17 that you pointed the Commission to in response to a
18 question about infrasound and its potential adverse
19 health effects on people.

20 A. I'm there.

21 Q. Can you turn to page 11 for me of that exhibit.

22 You see the heading "Results"?

23 A. I do.

24 Q. And it talks about the literature that it reviewed
25 and that only 11 articles reporting seven different

1 cross-sectional studies investigated the associations
2 between wind turbines and health.

3 Do you see that?

4 A. I do.

5 Q. So that's what this study was looking at was those
6 11 articles that were all focused on those seven
7 cross-sectional studies; right?

8 A. That's correct.

9 Q. Now go down to the last sentence on page 11 there
10 under Noise. It says, "Noise produced by wind turbines
11 was discussed in all seven studies, but infrasound and
12 low frequency noise were not specifically measured or
13 discussed."

14 So if this study wasn't looking at infrasound or
15 noise, why were you directing the Commission to it as
16 support for your position on infrasound and adverse
17 health effects?

18 A. Because this, like the other studies that we've
19 talked about, look at wind turbines in general, and
20 that's one of the ways that in epidemiology -- obviously,
21 you'd like to know the exact level of exposure to every
22 individual in every study, but in epidemiology we don't
23 get to do pure data sources.

24 And so what I've done is pulled the literature,
25 looked at the literature where they have reviewed the

1 experience around wind turbine farms. And so has each
2 one of them measured infrasound or used C-weighting
3 measurements? Probably not. But they have looked at
4 wind turbines, wind turbine farms, and made conclusions
5 about the health effects.

6 Q. Go back to your Rebuttal Testimony.

7 The question that was asked in your Rebuttal
8 Testimony was about infrasound particularly from wind
9 turbines and its potential impacts on human health. And
10 you referred the Commission to this Exhibit 2c that has
11 nothing to do with infrasound and specifically says that
12 noise produced by wind turbines, infrasound and low
13 frequency noise, were not measured or discussed.

14 So I guess my question was why were you pointing
15 the Commission to this study in response to that
16 question?

17 A. Because, number one, it's a national study. It's a
18 scientifically generated review of the literature, and I
19 felt it good to provide the Commission with additional
20 information about the question about health effects.

21 Excuse me. Health effects associated with wind
22 turbines. I should be specific.

23 Q. Let's look at the French 2017 study you responded to
24 in that question with.

25 Exhibit A4-3.

1 A. Is there a question?

2 Q. Yep. Let's just go straight to the epidemiological
3 section of that study. I think it starts on page 9 of
4 the exhibit.

5 Doesn't it state that they considered that no
6 conclusions can currently be drawn as to the health
7 impacts from noise and turbines?

8 A. Could you point me to where you're reading that?

9 Q. Yep. Last sentence of the section, Limited and
10 Inconclusive Studies. Review of Epidemiological Data.
11 "Given the small number of studies undertaken on this
12 topic and their methodological shortcomings, it should be
13 considered that no conclusions can currently be drawn as
14 to the health impacts of noise from wind turbines."

15 Do you see that?

16 A. Correct. I see that.

17 Q. So this study is saying that no conclusions can be
18 drawn as to whether or not wind turbines cause adverse
19 health effects or whether they don't cause adverse health
20 effects.

21 A. Well, that's not under the conclusions.

22 So if you look at down below where it says,
23 "Exposure to infrasounds and low frequency sounds from
24 wind turbines is merely one of the many assumptions
25 reported" blah-blah-blah "to explain these effects. The

1 situation is not specific to wind turbines."

2 So what they're saying is the fact that the health
3 concerns are not specific to wind turbines, not specific
4 to the sound that they generate, and so that's one of the
5 conclusions on page 9 of 15.

6 Q. Yeah. But so there's no conclusions can be drawn as
7 to whether or not there are adverse health effects caused
8 by wind turbines or whether wind turbines don't cause
9 adverse health effects?

10 A. Actually I think what they were referring to is the
11 fact you can't make a conclusion about whether it's sound
12 or what aspect of the wind turbines it is.

13 Q. And actually on page 10 there it says that, "No
14 epidemiological studies have even been conducted that
15 examine the health effects of infrasounds and low
16 frequency sounds produced specifically by wind turbines."

17 Do you see that?

18 A. I do.

19 Q. Is that true?

20 A. Best of my knowledge, specific to wind turbines,
21 there have been some studies as far as measuring the
22 levels but not epidemiological studies.

23 Q. So from an epidemiological perspective, we just
24 haven't looked at whether or not the noise generated by
25 wind turbines causes adverse health effects?

1 A. No. That's not correct. That sentence says
2 infrasound and low frequency sound specifically. Sound
3 in general from wind turbines has been evaluated.

4 Q. Okay. So you'd agree that no epidemiological
5 studies have looked at whether or not the low frequency
6 noise and/or infrasound causes adverse health effects?

7 A. That's part of the answer. That's correct.

8 Q. And that warrants additional research into the
9 topic; correct?

10 A. As a former academician, you can never say that
11 there's not more research that needs to be done. And so,
12 yes, this will continue to be evaluated. It's a moving
13 target.

14 Q. And you actually encouraged additional research in
15 your peer-reviewed publication; right?

16 A. Every academician includes that statement at the end
17 of their research as hoping to stimulate additional
18 research.

19 Q. And so the peer-reviewed publication that you
20 authored, sent to your colleagues for peer review, also
21 got published and stood behind in the academic world, you
22 concluded that the answer to the question of whether or
23 not exposure to wind turbine sound is a human health risk
24 is still under review and warrants further research and,
25 further, that the research has demonstrated that low

1 frequency sound can elicit adverse health effects such as
2 vibration or fatigue, as well as annoyance or
3 unpleasantness response.

4 But now you're -- it seems to me you're offering a
5 different opinion to this Commission in your rebuttal
6 than your original testimony.

7 MS. AGRIMONTI: Objection. Argumentative.

8 MR. DE HUECK: Sustained.

9 Q. Have you published -- the opinions you're offering,
10 have you included those in any publication?

11 A. No.

12 Q. That have been peer reviewed?

13 A. No.

14 MR. ALMOND: Okay. No further questions.

15 MR. DE HUECK: Very short recess.

16 (A short recess is taken.)

17 MR. DE HUECK: We're back in session. We are at
18 Mr. Fuerniss for cross-examination of Mr. Roberts.

19 MR. FUERNISS: I'll be brief. Just a few
20 questions.

21 CROSS-EXAMINATION

22 BY MR. FUERNISS:

23 Q. Although I would like to visit with you at length.
24 In discussing the strict, you know, scientific
25 evaluations, are case reports then of no value?

1 A. No. I think that case reports are that first
2 indication of a potential issue, potential problem. But
3 how many times have you read in the newspaper the latest
4 discovery is?

5 This week my wife told me that after cigarette
6 smoking, obesity is the next most common cause of cancer.
7 That's a case report.

8 Q. Uh-huh.

9 A. Actually that's a case series. And so a lot of
10 those case reports never pan out. Most journals,
11 peer-reviewed published journals, won't publish case
12 reports anymore. And that's very, very unfortunate
13 because that's where we get the first kernel of
14 identification of a potential problem.

15 Q. So it's kind of like going to the doctor. I've got
16 a sore throat, and then he takes it from there?

17 A. Exactly. All the way, on the population basis.

18 Q. Uh-huh. Okay. Thank you.

19 Would you agree with this statement: Action in
20 defense of the public health does not require certainty?

21 A. I don't think you can ever achieve certainty. Okay.
22 So technically I think that's correct.

23 I think that in public health we have to make
24 decisions based on the data that's available, the
25 information that's available. It's not always

1 comfortable. I can tell you. I helped commissions like
2 this in my tenure at the State Health Department. But
3 you have to make a response based on the data as it's
4 presented, the information that's there.

5 Q. So would you say that -- obviously, there's ongoing
6 research in these areas yet -- that we should not wait
7 until we're certain or that we should take some action
8 now to back off to protect public health, whether it's
9 from a negative perception or from an actual physical
10 event?

11 Do we need to wait until we have absolute certainty
12 or more and more studies are done to get the percentages
13 of ifs down further?

14 MS. AGRIMONTI: Excuse me. I didn't mean to
15 interrupt you, Mr. Fuerniss, but I've already done it.

16 You appear to be asking several questions while
17 you're talking so I would object on that basis. If it
18 could be broken down, I think it would be a clearer
19 record.

20 MR. FUERNISS: Okay.

21 Q. Should we wait on more research, I guess is what I'm
22 asking.

23 A. You have to make decisions. This Commission has to
24 make decisions based on the data it has. We as
25 scientists have to make decisions. As public health

1 officials we have to make decisions based on the science
2 that we have.

3 Q. Okay.

4 A. Excuse me. That's my opinion.

5 Q. Okay. Could some of these studies and reports -- in
6 their conclusions they will say something like evidence
7 of exposure to wind farms was not associated with, you
8 know, adverse health effects or whatever. Could they
9 just as well say that it was or was not, that it may or
10 may not?

11 Would that not be a more neutral stance?

12 A. It's a more neutral stance, but they're interpreting
13 the data as they see it and as the studies that they've
14 looked at.

15 Q. All right. When it comes to the acoustic energy
16 exposure, is there a difference between acute and
17 chronic?

18 A. I'm not aware of data on chronic exposures to low
19 frequency that has been confirmed. Vibroacoustic disease
20 would be classified as a chronic condition if research
21 ever convinces folks that that's what it is.

22 Acute effects, absolutely. I mean, you can lose
23 hearing from high-level exposures. So the chronic --

24 But then the chronic effect is also -- not of
25 infrasound but sound in general of like high-frequency

1 hearing loss that you and I are going to experience.

2 Q. So you would not necessarily agree with Moller and
3 Pedersen that the low frequency sounds are an
4 especially important part of wind turbine sounds?

5 A. I don't -- I think that you have to understand
6 how -- that Pedersen's looking at it -- he really -- I'm
7 not sure if it's a he or a she. I haven't met the
8 person.

9 It's the annoyance factor that's the big part of
10 that, the visual part as well as the auditory part.

11 Q. And so, to your way of thinking, perhaps if a person
12 has a negative perception of the whole wind farm concept,
13 they're more likely to be annoyed than if a person has a
14 positive reaction to it?

15 A. That is totally human nature and normal.

16 Q. Are you dismissing then any possibility of any
17 actual physiological response?

18 A. As a scientist you can never rule that out.

19 Q. Could you explain a little bit the difference
20 between sensitization and habituation?

21 A. I'm not sure -- I've looked at it in terms of
22 sensitization and noise exposure, but habituation I have
23 not looked at it in terms of sound so I can't -- I'm not
24 sure that I could say much on that.

25 Sensitization is two parts. One of the things is we

1 often think about sensitization about allergies, getting
2 exposed and the next time you have a reaction. But in
3 hearing you can also have sensitization that you attach
4 certain emotional responses to a particular sound.

5 We are sensitized to fire engines, to ambulance
6 sirens, that sort of thing. It has nothing to do with
7 the level. It has to do with what we associate with it.
8 So there's -- Steve Cooper talked about sensitization in
9 the Kate Bridgewater Australian study of six to eight
10 people. That was not well defined.

11 So sensitization can occur, but it has as much
12 emotional response as physical response, I think.

13 Q. Okay. One last thing.

14 We talked often here about peer review. Those peer
15 reviewers that basically can a project -- or I should say
16 a paper or a document or something, does anybody ever
17 find out about what they had to say?

18 A. Usually in the peer-review process there's a series.
19 You get the responses back from the peer -- from the
20 reviewers. You don't know who they are. They're usually
21 not identified, and they give you a chance to -- unless
22 it's a mortal wound to the paper, they give you the
23 chance to address it and clarify it.

24 So you do get to see the reviewer's responses in
25 most journals.

1 MR. FUERNISS: I guess that's it for now. Thank
2 you.

3 MR. DE HUECK: Ms. Jenkins.

4 MS. JENKINS: No questions.

5 MR. DE HUECK: Ms. Pazour.

6 MS. PAZOUR: No questions.

7 MR. DE HUECK: Staff.

8 MS. REISS: Yes. Just briefly. Thank you.

9 CROSS-EXAMINATION

10 BY MS. REISS:

11 Q. Dr. Roberts, based on your professional opinion,
12 what level of audible sound from wind turbines would lead
13 to adverse health impacts?

14 A. I'm not sure that I can give you a number. You
15 know, we know that higher levels of physical painful ones
16 in the 110, 120, the jet engine sort of sound levels --
17 you know, I've seen levels as high as 55 that have been
18 for approval of wind farms. I've seen levels I think as
19 low as 35. So I can't answer. I haven't formed an
20 opinion of what is a reasonable level.

21 What I've seen is that in the projects that I've
22 been involved with, they've managed the design and that
23 sort of thing to the level required by the statute or the
24 Commission has required them to do.

25 Q. You testified earlier that you reviewed shadow

1 flicker as a part of your review of this docket and your
2 testimony; is that correct?

3 A. Tangentially. It was primarily about health effects
4 and sound. But, yes, I was asked to address the question
5 of shadow flicker or be able to.

6 Q. Based on your review and in your professional
7 opinion, what level of shadow flicker impact from a wind
8 turbine could lead to an adverse health impact?

9 A. Well, again, the few situations that I've seen, they
10 have done the 30 hours per year. I don't recall about
11 the hours per day. So at this point I don't think
12 there's enough literature to tell us whether 30 is right
13 or 25 is right.

14 We are all exposed to flicker. And I think the one
15 thing I would recommend is carefully consider that shadow
16 flicker is no different than flicker from other devices
17 except for the emotional attachment that it may have to
18 the source.

19 Q. Okay. And then just briefly, it seems a majority of
20 your Supplemental Direct Testimony focuses on a lack of
21 an epidemiological study proving causation of health
22 effects from wind turbines; is that correct?

23 A. Well, that's one of the things. But the scientific
24 process goes where -- the case report, like we've talked
25 about and then a series of studies and evaluations. And

1 what I have provided to the Commission is where panels
2 have gone in and looked at the data, looked at the
3 published material, and rendered opinions about it.
4 That's how we get from association to causation.

5 Cigarette smoking is the best example. People
6 smoked for years, and there was discussion about lung
7 cancer and that sort of thing. But before the Surgeon
8 General impaneled their group and the group came out and
9 said there is association -- so there has to be a review
10 of the material. And it can be -- it can happen more
11 than once, as I have demonstrated here in my exhibits.

12 Q. Okay. Typically how long would an epidemiological
13 study that you discussed take?

14 A. An epidemiological study to look at wind turbine
15 health effects would be very, very difficult to design.
16 I'm not going to say it couldn't be designed.

17 But one of the things as we talked about Pedersen
18 for example in the publications in the Scandinavia
19 countries, how do you get around the visibility. Some of
20 the studies have looked at using recordings of wind
21 turbines and using speakers that would give the same
22 infrasound in the sound booth, and they've shown that
23 they can -- the reported adverse effect in the sound
24 booth is directly related to the person's opinion -- I'll
25 use that word, opinion, about wind turbines.

1 So how long would it take? It could take years to
2 do one study. And one study, one epidemiological study,
3 is not going to prove it one way or the other.

4 Q. Okay. So, in your professional opinion, until we
5 have an epidemiological study to prove one way or
6 another, there should be no specified limits?

7 A. No. What I'm saying is we have to use the data, the
8 ongoing research that's being done. You know, there's
9 certainly driving interests in it. Academicians are
10 looking at it. And it's going to be even more difficult.

11 But there will continue to be information available
12 or scientific information developed that will help to
13 refine the point about what the level should be.

14 MS. REISS: Staff has nothing further. Thank
15 you.

16 MR. DE HUECK: That will take us to Commission
17 questions, and I'll start with Vice Chairman Hanson. You
18 can, of course, pass it if you'd like to.

19 COMMISSIONER HANSON: Thank you. Appreciate
20 that.

21 Dr. Roberts, good afternoon.

22 THE WITNESS: Good afternoon to you.

23 COMMISSIONER HANSON: I don't believe I have
24 many questions. But that's relatively speaking in
25 comparison to others who have asked you questions, I

1 guess.

2 Did I understand you to say that there are no
3 health effects from flicker at any frequencies?

4 THE WITNESS: No. I didn't say that.

5 COMMISSIONER HANSON: Okay. I thought you had
6 said that there are health effects at some frequencies.

7 THE WITNESS: I appreciate the opportunity to
8 clarify that.

9 There is a condition called photosensitive
10 epilepsy. And it was a -- a very -- we can laugh about
11 it now, but a very severe emotional situation occurred
12 in Japan with a -- one of the early Pokeman games where
13 it was at a frequency that would induce epileptic
14 seizures among those people that were conditioned for
15 that.

16 And that is in the range -- it's not in the
17 range of wind turbines. In fact, it's much higher. It's
18 like 10 to 25 hertz, and a wind turbine is about .5 to
19 1.25, maybe 1.5 hertz.

20 So the point I was making is, yes, there is
21 flicker. Light impulses can cause seizures, but it's at
22 higher levels than are associated with wind turbines.

23 COMMISSIONER HANSON: I appreciate your answer
24 because that was the second question. And I'm glad you
25 elaborated on that.

1 Would strobe lights, for instance, then cause
2 the epileptic seizure?

3 THE WITNESS: Some strobe lights can. In fact,
4 at one point I saw something about there is a time
5 interval for a strobe as well. So strobe lights, disco
6 lights, that sort of thing can in some circumstances have
7 the frequency to stimulate it.

8 The Pokeman event, I think, was with blue-green
9 light. So light may have something to do with it as
10 well.

11 COMMISSIONER HANSON: Are you familiar -- I'm
12 sure you are -- that wind turbine blades turn at
13 different speeds depending upon wind velocity?

14 THE WITNESS: That's right. And I have actually
15 asked about that and was -- my .5 to 1.25 is based on --
16 the high end at the time that I did that calculation was
17 based on the maximum speed that the turbine -- that they
18 would operate the turbine at. So and I don't remember
19 the particulars of that, but that's a number that's in
20 the literature.

21 COMMISSIONER HANSON: Would the light flicker
22 frequency change depending upon whether it was closer to
23 the nacelle or farther away on the blade?

24 THE WITNESS: There is a difference, I think, in
25 the flicker, depending on the width of the blade. And as

1 you may recall, the blade changes, the face of it
2 changes, as you go up. And also the tilt of the blade.

3 I think in the end it doesn't make that much
4 difference because it's all blending as it comes toward
5 the recipient.

6 COMMISSIONER HANSON: So you don't think that
7 the frequency changes?

8 THE WITNESS: I don't think the frequency
9 changes. Maybe the intensity.

10 COMMISSIONER HANSON: Okay.

11 THE WITNESS: But I'm not an engineer, sir.

12 COMMISSIONER HANSON: All right.

13 Can convulsions be brought on in a short
14 period -- duration? Using the frequency that you were
15 talking about?

16 THE WITNESS: Can we --

17 COMMISSIONER HANSON: Does it take a long
18 period of time to see that flicker, or is it a shorter
19 duration?

20 THE WITNESS: It all depends on the individual.
21 And I'm taking convulsion to mean epilepsy.

22 COMMISSIONER HANSON: Yes. That's right.

23 THE WITNESS: Okay. A period of exposure, I'm
24 not sure about that. I'm not sure I can answer that.

25 Those people that are extremely sensitive, I

1 would say it was a very short period of time, but that's
2 the best I could answer.

3 COMMISSIONER HANSON: All right. A lot of my
4 questions have to do with that specifically, and your
5 clarifications that you're speaking have answered most of
6 them. Appreciate that.

7 You said -- maybe I'll just let you tell me what
8 you said. But I believe you said that we are sensitive
9 to fire and ambulance sirens; however, our sensitivity
10 has nothing to do with volume. I swear that's what you
11 said.

12 THE WITNESS: I did say that.

13 COMMISSIONER HANSON: All right. Intuitively
14 that just doesn't seem to ring true with me.

15 Loud noises surprise us. Loud speeches inspire
16 us. Loud crying causes us into action. Loudness deals a
17 great deal -- volume deals a great deal with our lives.

18 And so volume of something that's irritating, if
19 it's a -- like my tinnitus, I get accustomed to that.
20 It's 24/7. When I first wake up the volume's louder so
21 it bothers me more then. So I don't take naps during
22 these hearings.

23 So when that occurs I have to deal with it for
24 that short period of time. If it was like that all the
25 time, it would be very, very burdensome for me. So help

1 me with that volume makes no difference.

2 THE WITNESS: Okay. And what I was talking
3 about there I believe was -- had to do with emotional
4 response. Number one is the emotion. Something is
5 happening.

6 The volume is one of, is it coming toward me?
7 Where is it coming from? So it's two different responses
8 to the same noise.

9 And so it's -- there are emotional aspects to
10 all the noises that we hear. I think I said probably in
11 testimony that one person's noise is another person's
12 music. A baby crying means different things to different
13 individuals.

14 A siren means different things. And what I was
15 trying to maybe inartfully explain is that there are
16 emotional aspects to sound as well as the other insight
17 to sound like what direction is it coming from? Is it
18 coming toward me, and how fast?

19 COMMISSIONER HANSON: All that's good, but it
20 doesn't answer my concern then.

21 If something irritates us, if we don't want it
22 to be there, the volume is not very loud, we seem to live
23 with it better than if the volume is loud.

24 At the same time, if it's an irritating noise,
25 even if it's not very loud, it will bother us

1 significantly. So how does that jive with -- for folks
2 who don't want the turbines close by and they can hear
3 them? Won't that just really bother them a lot?

4 THE WITNESS: Yes, it will. And I apologize
5 that I have not been more clear with the question.

6 Absolutely. When you attach a certain response
7 to a sound -- the classic example is fingernails on a
8 blackboard. I didn't even -- you don't even hear it now
9 but I said that and you felt it, I think, probably.
10 That's something that we all recognize as being extremely
11 irritating.

12 The other thing is the fear of the unknown. If
13 you know what it -- that sound wakes you up or you hear
14 that sound and you don't know what it's from, is that a
15 gas leak? What is that? And then you explore and find
16 what it is. You can often accept that as not being
17 dangerous, life-threatening and move on and ignore that
18 sound.

19 COMMISSIONER HANSON: Thank you.

20 And your testimony is that wind turbines,
21 blades, will not emit a frequency that would cause an
22 epileptic convulsion.

23 THE WITNESS: The flicker, the light frequency,
24 is not high enough that would cause epilepsy. That's
25 correct.

1 COMMISSIONER HANSON: All right. Thank you.

2 THE WITNESS: Stimulate. I'm not going to say
3 cause. Stimulate an epileptic response.

4 COMMISSIONER HANSON: Correct.

5 THE WITNESS: Excuse me.

6 COMMISSIONER NELSON: Good afternoon.

7 THE WITNESS: Good afternoon.

8 COMMISSIONER NELSON: In your discussion with
9 Mr. Almond you talk about the fact that there's been a
10 45 dBA limit established for this particular project;
11 correct?

12 THE WITNESS: In one county. I don't know that
13 it's for the whole project.

14 COMMISSIONER NELSON: And I think that is
15 correct. Yes. In one county.

16 Is it correct that there have not been any
17 limits established for the level of infrasound allowed
18 for this project?

19 THE WITNESS: As far as I know, that's correct.

20 COMMISSIONER NELSON: If there have not been any
21 limits established for infrasound, how can you determine
22 that infrasound would not cause health issues from this
23 project?

24 THE WITNESS: I am taking the material that I
25 have provided, and that's just a snapshot of the

1 material, and based on the information provided from
2 those reviews of peer-reviewed literature, I'm testifying
3 to the Commission that that information, that data, does
4 not indicate that there's an adverse health effect from
5 wind turbines in general at the levels that the various
6 studies have done.

7 COMMISSIONER NELSON: If you would turn to
8 Exhibit 4 from your Rebuttal Testimony, and I think
9 that's been labeled Exhibit A5-4. And page 20.

10 THE WITNESS: That's the Amsterdam study?

11 COMMISSIONER NELSON: It's entitled Health
12 Effects Related To Wind Turbine Sound.

13 THE WITNESS: Yes. Gotcha.

14 COMMISSIONER NELSON: And I don't think in your
15 Rebuttal Testimony that you ultimately quoted from this
16 study, but since you included it as an attachment, I'm
17 going to ask you a question from it.

18 THE WITNESS: You said page 20?

19 COMMISSIONER NELSON: Correct.

20 THE WITNESS: I'm there.

21 COMMISSIONER NELSON: Under Conclusions could
22 you read the first sentence of the Conclusion.

23 THE WITNESS: "Noise annoyance is a main
24 health" --

25 COMMISSIONER NELSON: We're not on the same --

1 we're not on the same page.

2 Page 20, upper left-hand corner.

3 7. Conclusions.

4 THE WITNESS: Gotcha.

5 COMMISSIONER NELSON: If you could read the
6 first sentence, please.

7 THE WITNESS: "Available scientific research
8 does not provide a definitive answer to the question
9 whether wind turbine sound can cause health effects which
10 are different from those from other sound sources."

11 COMMISSIONER NELSON: So if the science hasn't
12 ultimately answered the question that we're all wrestling
13 with here today, how can we as a Commission proceed with
14 this project without risking making a very large mistake
15 that may have health implications down the road for the
16 good folks down there?

17 THE WITNESS: Well, number one is the last part
18 of that sentence is really important. "For those other
19 sound sources."

20 So it's combining -- for me that conclusion is
21 drawing on all the information we have about sound. Not
22 just about infrasound. Not specific for infrasound.

23 And, number two is this is just one study. Or
24 one review out of the many that I have had. And, as I
25 testified, I won't always agree with everything, but in

1 general what I'm saying is the literature does not
2 indicate there's a specific adverse health effect
3 associated with wind turbines.

4 So my opinion would be or my suggestion would be
5 to make the decision based on the literature that's
6 before us now. The answer -- you can't -- as was asked
7 over here, the science will never be complete.

8 COMMISSIONER NELSON: Yeah. And I heard that
9 earlier testimony. And I'd love to perry that with you,
10 but in the interest of time I'm going to let that go.

11 One other, if you would look at Exhibit 1 from
12 your Rebuttal Testimony, and that's titled Low Frequency
13 Noise, Including Infrasound: Report On The Measurement
14 Project.

15 THE WITNESS: That's A4-1?

16 COMMISSIONER NELSON: A5-1.

17 THE WITNESS: A5-1.

18 COMMISSIONER NELSON: From your Rebuttal
19 Testimony. And I'm looking at page 10.

20 THE WITNESS: That's the German study?

21 COMMISSIONER NELSON: I believe so, yes.

22 THE WITNESS: And that is our page 10.

23 COMMISSIONER NELSON: Yeah.

24 THE WITNESS: Got it. I'm there.

25 COMMISSIONER NELSON: And in the lower left

1 corner, the bullet point. And they're talking about
2 doing some actual measuring of infrasound. And this
3 bullet point says that, "At a distance of 700 meters from
4 the wind turbines it was observed by means of
5 measurements that when the turbine is switched on the
6 measured infrasound level did not increase or only
7 increased to a limited extent. The infrasound was
8 generated mainly by the wind and not by the turbines."

9 And so what -- here's what I'm really wrestling
10 with: Whether we as a Commission are ultimately going to
11 be able to decide in this proceeding whether or not
12 infrasound is harmful or not from wind turbines. I don't
13 know if we're going to be able to determine that.

14 But what I'm taking from this bullet point is
15 that if you're at least 700 meters out, it's
16 immeasurable. It's not there. Is that a correct
17 interpretation of what this is saying?

18 THE WITNESS: In my opinion, it is.

19 MR. ALMOND: Can I object to that question?
20 Lacks a foundation to answer that. I just want that out
21 there. But I understand you're the one asking it.

22 COMMISSIONER NELSON: Well, yeah. And I'm
23 looking for really an honest answer here.

24 But, I mean, yeah. We don't know the parameters
25 under which this measurement was done, but that's what

1 it's saying.

2 And I will be asking your witnesses the very
3 same question. Because I need to understand how far does
4 this stuff go? And that's the genesis of my question.

5 THE WITNESS: And I appreciate the genesis of
6 your question.

7 And the point being that it is what it is,
8 number one, is at 700 meters they couldn't identify it.
9 That doesn't mean at 650 they couldn't identify it
10 either. So that's one of the things that you have to
11 continue to deal with in the science world. You have to
12 take the information as it's presented.

13 So I find comfort in that at 700 meters, but
14 does that mean that you should set it at 700 meters? No.
15 You can be comfortable at 700 meters, but if there's data
16 that shows that it's 600 or 500 and the same thing is
17 occurring, then you can have comfort with those levels as
18 well.

19 So your question is very, very important.

20 COMMISSIONER NELSON: And I understand -- and I
21 agree with everything that you've said, and I've gone
22 through that thought process in my mind: Is there some
23 lesser distance. But they didn't test that, other than I
24 think they tested it at 300 meters.

25 And so, based on their tests, somewhere between

1 300 and 700 it dissipated.

2 THE WITNESS: Exactly. In this situation. But,
3 you know, this is --

4 One of the other things that this study does is
5 it also talks about the infrasound that's all around us.
6 And one of the things is -- that concerns me is setting a
7 level for infrasound might restrict this room. Might
8 restrict my home.

9 So it's a delicate process. As you know better
10 than me, it's not an easy process. But I think that you
11 have use the science that's before us. It's always --
12 science is never complete. And I'd love to have that
13 discussion with you, but we -- we try.

14 COMMISSIONER NELSON: Thank you. No further
15 questions.

16 MR. DE HUECK: Chair Fiegen.

17 (Discussion off the record.)

18 CHAIRWOMAN FIEGEN: I'm going to go back to the
19 question about the Germany dBA and that going to -- was
20 it 35 to 37 or 33/37?

21 THE WITNESS: I don't remember the range.
22 Around 35 in Germany.

23 CHAIRWOMAN FIEGEN: Okay. And then you also
24 stated that you have been part of -- I don't know exactly
25 how you'd clarify that, part of something that were 55 to

1 35. So I don't know if they were evidentiary hearings,
2 wind docket and developments, if you were talking
3 about --

4 Could you clarify the range that you talked
5 about from 55 to 35?

6 THE WITNESS: Be glad to. Thank you for the
7 question. I'd like to clarify that.

8 It's not at evidentiary hearings. It's what was
9 in the literature in various countries and at various
10 times. And that's one of the other things besides just
11 looking at the literature like in 2013 when we wrote that
12 paper. Every year more information becomes available.
13 Numbers change over time.

14 So 55 was -- at that point, as I recall --
15 because I was kind of startled by it because I hadn't
16 seen a 55 before. That was early on in not necessarily
17 wind turbines but road traffic in general, railroad
18 traffic and that sort of thing, and where adverse health
19 effects were clearly associated with it.

20 So it was not about siting of wind turbines.

21 CHAIRWOMAN FIEGEN: So the only thing about the
22 35 dBA is from Germany? Otherwise, you didn't see it
23 anywhere on wind? That is the only place that when you
24 reviewed your literature -- is that the only publication
25 that you saw 35 dBA or 33 or 37? I can't remember

1 exactly.

2 THE WITNESS: No. There are other countries
3 that have numbers in the range of 35 to 40. But one --
4 and I can't testify to which and that sort of thing.
5 Just in my reading I recall that.

6 My problem is the fact you always have to go
7 back and look at it and see what they're saying with that
8 35, whether it's 10 minutes, eight hours, a yearly
9 average. You've got to look at it in terms of what that
10 number -- how that number is generated.

11 CHAIRWOMAN FIEGEN: Very true.

12 In science, as you know, there are so many
13 factors.

14 THE WITNESS: Absolutely.

15 CHAIRWOMAN FIEGEN: And you always have to
16 figure out what the factors are in the evaluation or the
17 peer review or whatever the case.

18 So as a Commissioner, we are certainly looking
19 at sound. And how can I make a decision that the
20 industry guidelines of 45 dBA is the number when we've
21 looked at a -- actually a lot of the literature you
22 reviewed, according to what I'm hearing from you, is
23 certainly a range. There's some under.

24 THE WITNESS: That is correct.

25 CHAIRWOMAN FIEGEN: Okay. Thank you.

1 MR. DE HUECK: Any redirect?

2 MS. AGRIMONTI: Yes. Thank you.

3 REDIRECT EXAMINATION

4 BY MS. AGRIMONTI:

5 Q. Dr. Roberts, you had a number of questions about
6 infrasound, and you noted that there is infrasound all
7 around us.

8 Can you please describe the sources of infrasound
9 that is in our environment?

10 A. Well, when you go into literature, first of all,
11 they talk about volcanos and surf, and I don't think
12 there's either one of them in South Dakota so we won't
13 talk about those.

14 But I've got a sound meter on my phone, and I've
15 become sensitized to measuring for sound levels.
16 Refrigerators, air ducts, air handling units are one of
17 the things. Many motors have low frequency -- generate
18 low frequency sound.

19 So that's one of the other things. If we begin to
20 have regulations about infrasound, we're going to have to
21 consider the other sources. Our lungs, our heart, our
22 diaphragm, my GI tract all make low frequency sounds. My
23 joints make low frequency sounds as well.

24 Q. When you were answering questions with Commissioner
25 Nelson you noted that wind turbines were not

1 associated -- sorry. The literature showed that there
2 were no health effects caused by wind turbines in
3 general. I wanted to follow up and ask if that includes
4 infrasound?

5 A. When they study wind turbines they study the full
6 gamut of whatever sound profile that wind turbine is
7 generating or that model is generating. So that would
8 include infrasound as well.

9 Q. You also testified in response to Mr. Almond about
10 the fact that science can't prove the negative. Can you
11 explain a little bit more about that?

12 A. Well, part of it is the fact that science is never
13 done. But unless you -- in science to prove the positive
14 you have a whole series of studies that show a positive
15 response or -- that it's more likely or not that X causes
16 Y.

17 We're never comfortable, unless we do the whole
18 population, that we can truly say negative. Just like we
19 can't say truly positive based on one study.

20 But the other thing is the fact that once a group of
21 studies have gotten out there that there is no
22 association, people are not going to do anymore research
23 on that unless something else stimulates them.

24 So we say in science that you can't prove the
25 negative.

1 Q. Is irritation a health effect?

2 A. No. Well, irritation when your shoe rubs your heel
3 and causes a blister, that is a health effect. But me
4 being irritated because of a late flight or whatever,
5 that is -- or a particular process, that is a normal
6 emotional response.

7 Q. Okay. Mr. Almond also asked you about some of your
8 exhibits, and I'd like you to turn to Exhibit A5-1,
9 page 12.

10 A. Okay. I'm there.

11 Q. Are you there?

12 I don't believe that you had the opportunity to
13 review the conclusion. Can you please read the
14 conclusion from that study.

15 A. The entire one?

16 Q. Just the first paragraph.

17 A. "Infrasound is caused by a large number of different
18 natural and technical sources. It is an everyday part of
19 our environment that can be found everywhere. Wind
20 turbines make no considerable contribution to it. The
21 infrasound levels generated by them lie clearly below the
22 limits of human perception. There is no scientifically
23 proven evidence of adverse effects in this level range."

24 Q. Thank you. Then I'd like you to move to
25 Exhibit A5-2 and page 4.

1 A. I'm there.

2 Q. All right. I'd like you to read the last sentence
3 of the Finding section on that page.

4 A. At the bottom of the page, or up at the top?

5 Q. At the bottom of the page under Findings From The
6 Literature Review On Health Effects. The last paragraph.
7 Yeah. It's a one-sentence paragraph.

8 A. "No clear association is seen between infrasound or
9 the low frequency noise of wind turbine noise and human
10 health."

11 Q. And this was the Japanese literature?

12 A. That is correct.

13 Q. And what was the panel that reviewed that
14 information or -- let me rephrase that.

15 Tell me about the authors of that study and why you
16 included it in your references.

17 A. The Japanese Minister of Environment set an
18 expert committee in 2013 to review the published reports
19 and evaluate basically wind turbine noise. And this was
20 the -- one of the presentations. This particular
21 presentation was 2017.

22 Q. All right. Then finally Exhibit A4-3, page 10.

23 Actually I'll start on page 9. Would you agree that
24 the conclusions of this literature start on page 9?

25 A. This French study?

1 Q. It's Exhibit A4-3, page 9.

2 A. I'm there.

3 Q. All right. And is this the beginning of the
4 conclusion connection of the article? Or what is the
5 proper term to describe this document?

6 A. This is, again, a panel review organized by the
7 French Director of what's called risk prevention and also
8 the director of health. Basically the Public Health
9 Department.

10 Q. All right. The next page, page 10, it lists a
11 number of bullet points that are summaries of what they
12 found in the literature; is that right?

13 A. That is correct.

14 Q. And the fourth bullet point says, "The connection
15 between potential physiological effects and the
16 occurrence of a health effect has not been documented."

17 Is that consistent with your conclusion?

18 A. That is correct.

19 Q. And then later down it says, "Due to its weak
20 scientific basis, vibroacoustic disease cannot explain
21 the reported symptoms."

22 Do you also agree with that?

23 A. I do.

24 Q. What is grey literature?

25 A. Grey literature is literature that's basically

1 generated through the government process. The government
2 empanels a group of individuals. The government could be
3 a State Health Department. It could be a State
4 Department of Environmental Health. It could be a
5 legislative committee.

6 And so they invite a group of scientists together to
7 review the literature and provide them with insight and
8 basically distill down what the science is around a
9 particular topic.

10 Q. Please turn to Exhibit I-35. This is the --

11 A. Got it.

12 Q. The article that you authored.

13 Can you please tell me what the purpose of I-35 was
14 when you wrote it?

15 A. This was -- I had gone into the literature and done
16 a review of the literature that was available at about
17 two thousand -- late 2012, I think, at that point and to
18 assess what the literature said about wind turbines and
19 health risk.

20 Q. How does what is in the article, I-35, relate to the
21 literature you referenced in your testimony?

22 A. Well, the references that I have used in the
23 testimony by and large have been published after this so
24 I have continued to follow the literature after I put
25 this article together.

1 So what I have presented is actually -- in the
2 exhibit is the up-to-date literature. So I did not
3 include my paper partly out of the fact that the -- there
4 are more current reviews that have been done since I did
5 mine.

6 Q. All right. And then on page I have 8 of 17 of that
7 document, at that time about five lines down you noted
8 that, "The adverse physical effects have yet to be fully
9 characterized."

10 Actually let me start at the beginning of the
11 sentence. "But the association of a particular pathway
12 between low frequency sound specifically generated from
13 wind turbine's annoyance and adverse physical health
14 effects has yet to be fully characterized."

15 Do you see that?

16 A. I do.

17 Q. Do you continue to believe that's the case?

18 A. Well, I think it's one of those things where it
19 continues to be an attempt to address it, but at this
20 time that's my opinion. My opinion stays the same.

21 Q. And then I'd like to go back to the literature that
22 you did reference in your testimony. There were some
23 questions about whether it was peer reviewed and you
24 noted that several of them were but for the most part you
25 were not aware of the peer-review process for the

1 government publications.

2 Do you recall that?

3 A. I do.

4 Q. Please tell us why you found the literature that you
5 cited to be persuasive and informative of your opinion.

6 A. One of the things is these are independent panels.
7 So each goes about it in a different way. And they're
8 using some of the same literature. So it's really a
9 different set of scientists looking at the literature. A
10 different country.

11 So it's one step up from one published paper. It's
12 an assimilation, if you will, of the research that they
13 found -- that they deemed through their process to be the
14 most important for them to review and summarize for their
15 government.

16 Q. And then finally will you please summarize the
17 various bases of sources of information and experience
18 that you relied upon to form your opinion.

19 A. My years of experience at the State Health
20 Department dealing with health concerns and community
21 concerns, cluster investigations, my training as a
22 physician, my training as an epidemiologist, and my
23 general experience in addressing these sorts of health
24 questions.

25 It's based on the literature, to the best of my

1 ability, to pull it together to help answer this
2 question.

3 MS. AGRIMONTI: That's all I have. Thank you.

4 MR. DE HUECK: Recross, Mr. Almond.

5 RE CROSS-EXAMINATION

6 BY MR. ALMOND:

7 Q. Dr. Roberts, you started off on redirect here
8 talking about how infrasound comes from several different
9 sources in the environment.

10 Is all infrasound equal from a health perspective?

11 A. I would say so.

12 Q. So the infrasound generated by your heart is no
13 different than the infrasound generated by a wind turbine
14 is your position from a health perspective?

15 A. At the same volumes I think that they would be
16 treated similar.

17 Q. And what about a constant infrasound --

18 A. As far as physiological response. Emotional
19 response might be different.

20 Q. And staying with physiological responses, what about
21 a constant infrasound versus a nonconstant infrasound?
22 Are those going to elicit the same physiological
23 responses?

24 A. No. Again, they would -- at the same volume you
25 might attach different significance to it based on your

1 concerns. I'll just stop there.

2 Q. What are the physiological responses to infrasound?

3 A. The physiological responses at high levels would be
4 some of the things that we talked about, aura and that
5 sort of thing. That's again at high pressure levels
6 because we don't hear those lower levels below probably
7 16 or 20, something like that.

8 But it could be increased heart rate. It could be
9 increased breathing. But some times you can't separate
10 those from the emotional response to a sound, if it
11 scares you.

12 Q. Are you aware of any peer-reviewed studies that
13 found that there's a physiological response to a low
14 volume -- or low frequency infrasound in the inner ear?

15 A. There have been some work on that where they're
16 looking at brain imaging to see how it's processed. But
17 that's very early, and as far as I can tell, it has not
18 been interpreted one way or the other.

19 Q. So are you aware of any studies focusing on the
20 inner ear and the physiological response that it imposes
21 on the inner ear -- strike that. Let me ask it in a
22 different way.

23 Are you aware of any peer-reviewed studies that say
24 that infrasound at low frequencies have a physiological
25 response on the inner ear?

1 A. I've seen people who have had opinions, have stated
2 opinions of that. I've seen studies by -- in guinea pigs
3 by Salt that are attempting to evaluate that, but I'm not
4 aware that it's confirmed.

5 Q. And those studies that you've seen, are those peer
6 reviewed?

7 A. Some of the -- I'm not sure the opinions are always
8 peer reviewed. Sometimes they'll be editorial.

9 The Salt studies have been peer reviewed.

10 Q. Those have concluded that infrasound at low
11 frequencies elicit a physiological response in the inner
12 ear; correct?

13 A. Well, number one is those are opinions in
14 peer-reviewed articles. So there's data, and then
15 there's opinions. That's his opinion.

16 And I'd have to look at it and see. I can't
17 remember. But most of his work is done on guinea pigs.

18 Q. You were asked whether or not irritation is an
19 adverse health effect, and I think the example you gave
20 was rubbing your heel on the back of your shoe is
21 irritable.

22 The blister that forms is the adverse health
23 effect?

24 A. I was actually trying to be more specific as far as
25 medically. Irritation can be abrasion of the skin, or it

1 can be an emotional irritation. So I'm just separating
2 those two. I'm not trying to be funny.

3 Q. And I'm just trying to understand the analogy you
4 were using. So maybe explain the analogy for me.

5 A. Well, I was just separating out that I wanted to
6 talk specifically about the emotional aspects of
7 irritation, not the physical aspects that would come from
8 friction of your skin or something like that.

9 Q. Okay. Different topic, going back to infrasound.
10 Studies have concluded that physiological effects
11 have been found in animals for levels of infrasound in
12 low frequency noise; right?

13 A. At high levels.

14 Q. Yeah. And no epidemiological studies to date have
15 actually examined the health effect of infrasounds and
16 low frequency sounds produced by wind turbines;
17 correct?

18 A. Actually they have in the sound booth studies that I
19 talked about. I think there are three or four of those.
20 I haven't -- I want to go back and look at those.

21 But what they were doing is they were actually
22 evaluating the aspect, the emotional aspect, what you
23 emotionally assign to the wind turbine. If you didn't
24 like the wind turbine, if you were afraid of the wind
25 turbine, that sort of thing, would you respond

1 differently to the sound?

2 Basically they showed -- it was either a video clip
3 or a news article, either adverse -- talking adversely
4 about wind turbines or -- against wind turbines or for
5 wind turbines. And if they pre-infected, if you will,
6 with the information against wind turbines, they were
7 more likely to report symptoms than the other way.

8 So there have been studies of infrasound, recorded
9 infrasound of wind turbines.

10 Q. My question was were those epidemiological studies?

11 A. They're political studies, and so -- epidemiological
12 studies are usually looking at populations using data
13 that's already been collected. And clinical studies are
14 where you actually give somebody a medication or you
15 expose them to something. So they're two different types
16 of studies.

17 But the clinical studies do contribute to the
18 epidemiology that we know.

19 Q. So the answer to the original question of whether or
20 not there have been epidemiological studies that have
21 examined the health effects of infrasounds and low
22 frequency sounds produced by wind turbines, there haven't
23 been any?

24 A. Given my answer, yes, they have.

25 Q. There have been --

1 A. Based my attempt to explain to you, I would answer
2 yes.

3 Q. Let's look at Exhibit A4-3. Page 10. You were
4 looking at that with Ms. Agrimonti. The last bullet
5 point there. Well, in the first --

6 It says, "No epidemiological studies to date have
7 examined the health effects of infrasounds and low
8 frequency sounds produced specifically by wind turbines."

9 Given that statement, was this French study just
10 unaware of the studies you just referenced or --

11 A. Either they were unaware of it, or they considered
12 clinical studies not epidemiological studies.

13 Q. Do you consider clinical studies epidemiological
14 studies?

15 A. They can contribute to the epidemiology. That's
16 correct.

17 MR. ALMOND: All right. Nothing further.

18 MR. DE HUECK: Mr. Fuerniss.

19 RE-CROSS-EXAMINATION

20 BY MR. FUERNISS:

21 Q. Yes. I just have one yes or no question.
22 Commissioner Fiegen brought up the 35 decibel level in
23 some jurisdictions around the world.

24 Are you familiar with the ISO 1996-1971
25 recommendations for allowable community noise limits

1 where they suggest rural during the daytime 35 dBA,
2 evening 7:00 to 11:00 p.m. 30 dBA, at night 11:00 p.m. to
3 7:00 a.m. 25 dBA?

4 A. No. I'm not familiar. I recognize that
5 designation, but I have not looked at that specifically.
6 And what I would look for is is are they talking about
7 an average over what period of time.

8 MR. FUERNISS: Thank you.

9 MR. DE HUECK: Mrs. Jenkins.

10 MS. JENKINS: No questions.

11 MR. DE HUECK: Ms. Pazour.

12 MS. PAZOUR: No questions.

13 MR. DE HUECK: Staff.

14 MS. REISS: No questions. Thank you.

15 MR. DE HUECK: Thank you very much for your
16 testimony. You may step down.

17 (The witness is excused.)

18 MR. DE HUECK: With that, we'll be breaking.

19 Let's be back at 2:30.

20 MS. AGRIMONTI: And, Mr. de Hueck, I understood
21 that we were going to be running late each day. Is that
22 still the plan?

23 MR. DE HUECK: Yeah. That is still the plan.
24 We haven't caucused about anything but 7 o'clock was on
25 the table and at the rate we're going, it's looking like

1 we're going to need every minute of it.

2 MS. AGRIMONTI: Thank you.

3 (A lunch recess is taken.)

4 MR. DE HUECK: Good afternoon, everyone.

5 Welcome back. Docket EL17-028. 26. EL18-026,

6 Prevailing Wind Park Docket is back in session after a
7 lunch recess.

8 We are in Prevailing Wind Park's direct case,
9 and, Prevailing Wind Park, you may call your next witness
10 to be sworn in.

11 Oh, I had one announcement. If you have any
12 witnesses -- and it goes for everyone. Any witnesses who
13 have an airplane to catch or a deadline, could you let us
14 know a little more in advance? And that would be
15 appreciated.

16 MS. SMITH: Certainly. We will do that. And we
17 had talked with opposing counsel and with Staff. We just
18 failed to share it with you. We apologize for that. And
19 the court reporter.

20 We would call Karen Peters.

21 Karen Peters,

22 called as a witness, being first duly sworn in the above
23 cause, testified under oath as follows:

24

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DIRECT EXAMINATION

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BY MS. SMITH:

Q. Can you state your name for the record and get your address as well?

A. It's Karen Peters. 29416 402nd Avenue, Wagner, South Dakota.

Q. And can you explain your familiarity with the project that's proposed here today?

A. We're early participants of the Prevailing Wind Project.

Q. And can you talk about who you are, where you live? Just introduce yourself to the Commissioners.

A. We are in the wind project and we own land, approximately 240 acres, and our house is located there. We have cow/calf pair organization as far as on our farm. We rent out our farm to our nephew.

MS. SMITH: And I'm going to ask, Hayley or Bridget, can you bring up the map so that we have it up here. We're going to bring up a blow-up of the map of the project.

Q. And can you talk a little bit more about the property? You indicated you have cow/calf pairs. And how big a place do you have?

A. We have about 240 acres. We have a house in that area. And I garden off to the side. I do work full

1 time. My husband's semiretired with a cow/calf
2 operation.

3 Q. And how long have you been on your place?

4 A. He purchased the place in 1977, and I've been on the
5 place with him for 22 years.

6 Q. And why did you decide to participate in the
7 Prevailing Winds Project?

8 A. We were familiar with the Beethoven Project. But
9 also due to the fact that my thought is wind is free so
10 why not capture it.

11 We are a very technical world anymore, and we're
12 using more and more electricity so if we can generate the
13 wind and produce electricity, why not do it.

14 Q. And you mentioned that you're an early participant.
15 Have you also had interactions with Prevailing Wind Park
16 since they purchased the project?

17 A. Yes. We have attended several of the meetings and
18 just learned more about the project all the time.

19 Q. As a landowner in the project, do you have any
20 concerns regarding the project? And, if so, have those
21 been addressed?

22 A. I'm not aware of any concerns that we've had at this
23 point.

24 Q. And do you have a wind turbine on your land?

25 A. No, we do not.

1 Q. In your view how do you think the project will
2 affect the community?

3 A. My husband's a clerk at the township. And Beethoven
4 is not too far away from us, and we have seen the revenue
5 that has been generated from the Beethoven Project to our
6 townships and to our county.

7 And as a result of that, our roads and our -- are
8 being maintained. We're replacing culverts. Where
9 several years ago we were looking from year to year what
10 we could do and what we couldn't do.

11 Also the education revenue that is generated in the
12 community is very good. The Prevailing Winds hopefully
13 will produce jobs in the area for people.

14 Q. And if you look in front of you, I've opened it
15 hopefully to the right page. There is an Exhibit A20-2.

16 Do you see that right there?

17 A. Yes, I do.

18 Q. Is that a map that shows your property and the
19 turbines around your property?

20 A. Yes, it does.

21 Q. And just for reference, again, that's in
22 Exhibit A20-2. It's responses to data requests.

23 And then --

24 MS. SMITH: Hayley, do you mind bringing that
25 up?

1 Q. If you could for the Commissioners -- and I'll do my
2 best to help because it's going to be pointing. But if
3 you could show the Commissioners where your property is
4 in the project area, that would be helpful.

5 A. We're right here in the project (indicating).

6 MS. SMITH: So Ms. Peters is pointing over to
7 the kind of middle western edge of the project.

8 Q. And do you happen to know your section/township?

9 UNIDENTIFIED SPEAKER: (Inaudible.)

10 Q. We're getting help from the audience, but we're
11 going to say it's Section 23.

12 A. 23.

13 MS. SMITH: All right. I have no further
14 questions.

15 MR. DE HUECK: Mr. Almond, cross-examination.

16 CROSS-EXAMINATION

17 BY MR. ALMOND:

18 Q. Good afternoon, Ms. Peters.

19 A. Hello.

20 Q. When did you sign up for this project?

21 A. We were one of the first participants of it when we
22 were signing up land. And I'm not good with dates or
23 times so I can't tell you that.

24 Q. Who approached you and asked you to sign up?

25 A. Different people, part of the Prevailing Winds.

1 Q. Yeah. Who?

2 A. Ron --

3 Q. Is that Ron Hornstra?

4 A. Yes.

5 Q. Anyone else?

6 A. He's just the one that sticks in my mind.

7 Q. You can't remember anyone else who approached you?

8 A. Not names, no.

9 Q. How about Roland Jurgens?

10 A. I know --

11 MS. SMITH: Objection. Asked and answered.

12 MR. ALMOND: I'm attempting to refresh her
13 recollection here.

14 MR. DE HUECK: Yep. Go ahead.

15 Q. Do you know Roland Jurgens?

16 A. I know Roland, but he didn't talk to us about it.

17 Q. Keith Thorstad?

18 A. Name doesn't sound familiar. Sorry.

19 Q. Did Mr. Hornstra -- when he asked you to sign up
20 your acres, did you sign up for the Beethoven Project and
21 the Prevailing Winds Project at the same time?

22 A. No. We were not in the footprint for the Beethoven
23 Project.

24 Q. Okay. So you didn't sign up for the Beethoven
25 Project?

1 A. Not that I'm aware of. My husband took care of a
2 lot of things so I'm just being honest in saying I'm not
3 familiar with that.

4 Q. And do you have an approximate year when you signed
5 up for the Prevailing Winds Project?

6 A. I'm sorry. I don't.

7 Q. Were you involved when Mr. Hornstra came and asked
8 you guys to sign up your land, or was your husband only
9 involved in that?

10 A. My husband and I were both involved with that.

11 Q. And you said you had 240 acres?

12 A. I believe that's what we have. We have another
13 20-acre piece off to the side.

14 Q. What's your husband's name?

15 A. Larry Peters.

16 Q. And I think I'm looking at the same map you pointed
17 at, but it looks like there's three separate parcels of
18 land all close to one another that you guys own?

19 A. Yes.

20 Q. And you guys signed up all three parcels?

21 A. Yes.

22 Q. Which parcel is your residence on? Is it the far
23 left one there?

24 A. If I could see roads, I would be able to identify it
25 better.

1 MS. SMITH: If I may, if you look at
2 Exhibit A20-2, if you have that one, it's the same three.
3 It's that one that's open.

4 Does that help you?

5 Q. Maybe I'll try asking it a different way. Of the
6 three parcels that you own, do you guys live in the
7 western most parcel?

8 A. Our house is located on the -- on the south. Yes.
9 So it would be the southern -- I don't know how to
10 describe it.

11 I'm sorry. I don't know how to describe it. I just
12 know I live there.

13 Q. And when you were talking to Mr. Hornstra about
14 signing up for this project were you hoping to get a
15 turbine or turbines?

16 A. Initially we were hoping, yes.

17 Q. How many turbines were you hoping to get?

18 A. If we got one, we would be very happy.

19 Q. Was it represented to you the possibility of getting
20 more than one turbine?

21 A. No. No. There was actually no representation that
22 we'd get any turbines.

23 Q. Okay. I'm going to have you look at Exhibit I-16.
24 Were either you or your husband provided with a document
25 that was similar to that?

1 A. I don't remember seeing that.

2 Q. Okay. That's the only question I have about that
3 exhibit so you can set that aside.

4 But if you could flip to I-17 in that book -- no.
5 To your right. The book you were just looking at.

6 Does this look similar to the lease agreement that
7 you and your husband signed up for this project?

8 A. Yes, it does.

9 Q. Okay. Do you have any family members in the project
10 area aside from you and your husband?

11 A. I'm sorry?

12 Q. Do you have any family members in the project area?

13 A. No.

14 Q. And aside from through the lease agreement that you
15 signed, are you or your husband in any way set to get any
16 sort of financial benefit from this project?

17 A. Well, the financial benefit that you get from it is
18 just being a part of the -- signing up for the program in
19 the land area.

20 Q. Right. So you guys aren't investors in any other
21 sort of project or future agreements or deals or anything
22 like that that would allow you and your family to
23 financially benefit from this project outside of that
24 lease agreement?

25 A. We are investors.

1 Q. And what do you mean by "investors"?

2 A. We purchased stock in it initially.

3 Q. In?

4 A. Prevailing Winds.

5 Q. And is the income of Prevailing Winds at all
6 affiliated with whether or not this project goes forward?

7 A. Well, with any type of investment you're going to
8 get a return on your investment hopefully. But it's --
9 it is what it is.

10 Q. My understanding is that the assets of Prevailing
11 Winds with respect to this project were sold to sPower
12 and that Prevailing Winds no longer owns --

13 A. That's correct.

14 Q. -- any of the assets.

15 So my question is is -- does Prevailing Winds have
16 any ability to benefit financially from this project any
17 longer?

18 A. Not that I'm aware of.

19 Q. So whether this project gets built or not, as an
20 investor of Prevailing Winds, you guys have no financial
21 benefit to this project anymore.

22 A. I don't know if I can answer that honestly.

23 Q. That's fair.

24 Are you familiar with the other investors of
25 Prevailing Winds? Do you know who they are?

1 A. No.

2 Q. Do you know if some people are investors or not?

3 A. No.

4 Q. I'm going to just read off a list of names, and if
5 you could tell me whether or not they're an investor in
6 Prevailing Winds --

7 MS. SMITH: Objection. Asked and answered.

8 MR. DE HUECK: I agree. She said she doesn't
9 know.

10 MR. ALMOND: May I be allowed to try to refresh
11 her recollection?

12 MR. DE HUECK: How long is your list?

13 MR. ALMOND: It can go quickly.

14 Q. Doug Koupal?

15 A. Yes.

16 Q. Any idea if he's an investor?

17 A. Well, I don't know if he's an investor or not. I
18 just know him.

19 Q. Oh, do you know of any other investors in Prevailing
20 Winds?

21 A. No.

22 Q. Okay.

23 A. Not that I could recite names, no.

24 Q. But if you heard the name, would you be able to tell
25 me?

1 A. Possibly not.

2 Q. Alfred Bartunek?

3 A. I know the gentleman.

4 Q. So if you don't know if they're investors, just say
5 I don't know.

6 A. Okay.

7 Q. If you do know, say yes.

8 A. Okay.

9 Q. If you know they're not, say no.

10 A. All right.

11 Q. Speed this up. Arlo Dewald?

12 A. No.

13 Q. Mildred Roth?

14 A. No.

15 Q. Keith Raysby?

16 A. No.

17 Q. Paul Erck?

18 A. No.

19 Q. Rodger Brandt?

20 A. No.

21 Q. Dennis Ded?

22 A. No.

23 Q. Dustin Powers?

24 A. No.

25 Q. Kurtz Farms?

1 A. No.

2 Q. Greg Hall?

3 A. No.

4 Q. Daryl Becvar?

5 A. No.

6 Q. You're saying no. Are you saying no, they're not
7 investors, or you just don't know?

8 A. No. I don't know.

9 Q. Okay. I asked you earlier if you had any family in
10 the project, and you said no.

11 What about your husband's family? Does he have any
12 family that's in the project?

13 A. Yes.

14 Q. And is your husband's family set to receive a
15 turbine?

16 A. I believe so.

17 Q. And who's your husband's family that lives in the
18 project?

19 A. The Koupals.

20 Q. The Koupals. Do you know how many turbines the
21 Koupals are set to receive?

22 A. Not for sure, no.

23 Q. And you don't know whether or not the Koupals are
24 investors in Prevailing Winds; correct?

25 A. I do not know that. I don't discuss my financial

1 situation with anyone.

2 Q. Have you been discussing with other people in the
3 community the possibility of moving from your residence?

4 A. Well, to be honest with you, my husband -- I'm
5 retiring the end of the year, and my husband told me that
6 if something happened to him, he didn't want me on the
7 farm.

8 We do have a couple young men where their families
9 farm in the area, and they would like to come back and
10 farm. And so we have opened it up to them if they are
11 interested. That is a possibility.

12 Q. Have you looked into where you're going to be moving
13 to? Have you thought that far ahead?

14 A. We've thought and we've checked out a few places but
15 there's nothing concrete whatsoever.

16 Q. The places you've checked out, are they in the
17 project area?

18 A. No.

19 Q. Turning back to Exhibit I-17, that agreement,
20 wouldn't you agree that you're contractually obligated to
21 assist Prevailing Wind Park in getting any sort of permit
22 that they're looking to get?

23 A. I'm not aware of that.

24 MR. ALMOND: Nothing further.

25 MR. DE HUECK: Mr. Fuerniss.

CROSS-EXAMINATION

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BY MR. FUERNISS:

Q. Hi, Karen.

A. Hello there.

Q. Oops. Sorry about that.

Do you have any idea as far as the actual dollar amounts that Choteau Creek Township benefits from the Beethoven Wind Farm?

A. The Beethoven Project I believe has brought in anywhere from 11 to \$17,000.

Q. Annually? Would you say -- is that a year?

A. Yes.

Q. Do you have any idea what that would amount to, say, as a per acre basis the way that we're taxed?

A. No, I do not.

Q. Okay. Would you agree that the township taxes have not been lowered because of that additional income? The money has been spent above and beyond what we're already taxed.

A. I can't answer that honestly.

Q. Okay. Just a couple more questions.

How long have you lived within, say, a mile of an operational wind farm?

A. Within a mile?

Q. Uh-huh.

1 A. We don't live within a mile.

2 Q. Okay. How long have you lived within two miles of
3 an operational wind farm?

4 A. As the crow flies, we're within two miles.

5 Q. As the crow flies.

6 A. Right. If you were going to fly straight northeast,
7 that's the first tower that we see.

8 Q. Uh-huh. And how far would you say that is from your
9 farm?

10 A. Are you talking driving distance?

11 Q. No. Just as the crow flies how far would you say it
12 is?

13 A. I would say approximately two miles.

14 MR. FUERNISS: Okay. Thank you.

15 MR. DE HUECK: Ms. Jenkins, go ahead.

16 MS. JENKINS: No questions.

17 MR. DE HUECK: Ms. Pazour, do you have
18 questions?

19 MS. PAZOUR: I have one, Karen.

20 CROSS-EXAMINATION

21 BY MS. PAZOUR:

22 Q. Your comment on where energy comes from, that's the
23 reason why you signed up, to help increase the energy,
24 the electricity.

25 But this new project, it doesn't sound like it's

1 coming to us. It's going outward.

2 A. That could be true. But with electricity our needs
3 have only expanded in the United States. I mean, we're
4 looking at electric cars, electric tractors. The
5 batteries that are being -- that are being used now and
6 stored for electricity.

7 Look around. Telephones, computers. I mean,
8 there's not anything that's not electric anymore. That's
9 why I'm looking at the technology and trying to help with
10 that technology. Because of the need increasing.

11 Q. Yep. I understand what you're saying. But what I'm
12 trying to say is, okay, if this project does get
13 accepted, wouldn't it be more beneficial to utilize the
14 energy that's coming in than bringing it from other
15 places?

16 A. I guess in the real world that would work, but we
17 don't get the electricity from the dam and how far away
18 is that from us?

19 MS. PAZOUR: Okay.

20 MR. DE HUECK: That will bring us to Commission
21 questions.

22 Commissioner Nelson.

23 Staff. Staff, I'm sorry.

24 MS. REISS: Thank you.

25

CROSS-EXAMINATION

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BY MS. REISS:

Q. Ms. Peters, Mr. Almond asked you a question about a provision in the wind easement. Do you recall that?

A. Pardon?

Q. Mr. Almond asked you about a provision in the wind easement.

A. Okay.

Q. Do you recall that question?

A. Yes.

Q. Okay. Did you review the wind easement before signing it?

A. Yes. But that's been quite a period of time.

Q. Okay. Were you satisfied that the wind easement adequately protects your interests?

A. I guess I'd have to honestly say yes; otherwise, I wouldn't have signed it.

Q. Did you have an attorney review the terms of the easement before you signed it?

A. No.

MS. REISS: Okay. Nothing further.

MR. DE HUECK: Commission questions.

Commissioner Nelson, none.

Chair Fiegen, any questions?

CHAIRWOMAN FIEGEN: One of them just got asked

1 because I was going to ask you if you hired an
2 attorney.

3 Help me understand the investor part. Because I
4 don't really understand that process like an ethanol
5 plant that I'm more familiar with.

6 So you were an investor in the beginning because
7 you went to a meeting maybe? Or they came out to sell
8 you stock? Or how does that work?

9 THE WITNESS: To be honest with you, my husband
10 was more involved in that than I was because I work full
11 time. We had discussed it as far as becoming investors
12 in stock. And so that's about all I can tell you.

13 CHAIRWOMAN FIEGEN: Okay. So then when you
14 became an investor of Prevailing Winds, then it was
15 sold -- was it last October?

16 THE WITNESS: To sPower.

17 CHAIRWOMAN FIEGEN: Yes. So then are you
18 still -- do you still have stock or your stock has been
19 sold and you are now --

20 THE WITNESS: Right. We're -- we're out of it
21 now. I mean, sPower owns it.

22 CHAIRWOMAN FIEGEN: So they bought your stock,
23 and you've been compensated for the stock you bought?

24 THE WITNESS: Yes.

25 CHAIRWOMAN FIEGEN: Okay. Thank you.

1 MR. DE HUECK: Ms. Smith, do you have any
2 redirect?

3 MS. SMITH: I do not.

4 MR. DE HUECK: Any recross?

5 Okay. With that, Ms. Peters, thank you very
6 much for your testimony. You may step down.

7 (The witness is excused.)

8 MR. DE HUECK: And, Prevailing Winds, you may
9 call your next witness to be sworn in.

10 MS. AGRIMONTI: We'd call Peter Pawlowski.

11 Peter Pawlowski,
12 called as a witness, being first duly sworn in the above
13 cause, testified under oath as follows:

14 DIRECT EXAMINATION

15 BY MS. AGRIMONTI:

16 Q. Mr. Pawlowski, would you please introduce yourself
17 to the Commissioners and parties.

18 A. I am Peter Pawlowski, and I'm the head of
19 development, of wind development, for sPower. I also
20 apologize for my voice. I was at a college football game
21 on Saturday, and it's a little more hoarse than I thought
22 it would be today.

23 Q. Please provide an overview of your education and
24 work history.

25 A. Sure. So I have an undergraduate degree in

1 aerospace engineering from the University of Maryland.
2 I've been in the energy industry almost 20 years, 14 of
3 that in wind. I've worked for a number of developers,
4 but for the last three years I've worked for sPower.

5 Q. What is your specific role in the Prevailing Wind
6 Park Project?

7 A. So as the head of wind development for sPower, I'm
8 responsible for everything associated with the
9 development of Prevailing Wind Park.

10 Q. And there have already been some questions today
11 about the relationship between Prevailing Winds and
12 Prevailing Wind Park.

13 Could you please explain.

14 A. Sure. So towards the end of last year, which I
15 believe was October of 2017, sPower purchased, from
16 Prevailing Winds, Prevailing Wind Park, LLC, which held
17 all of the assets of the project.

18 Q. You were here when Ms. Peters was talking about her
19 investment role in Prevailing Winds, were you not?

20 A. Yes, I was.

21 Q. Is there any public information that you could
22 provide to further clarify the role of an investor in
23 Prevailing Winds, recognizing that that's not your
24 company?

25 A. So the limited information I can provide is that

1 Prevailing Winds still exists, and sPower purchased the
2 project from Prevailing Wind Park -- or purchased the
3 project, Prevailing Wind Park, from them.

4 I don't know the specifics of their governing
5 documents or members or any of that information.

6 Q. Did you file Prefiled Direct Testimony identified
7 as -- oh, no. Sorry. You did not.

8 Did you file any Prefiled Direct Testimony? I've
9 given you the answer, so see if you get it right.

10 A. No, I have not.

11 Q. Are you adopting the prefiled testimony of Mr. Damon
12 that's A63 and Mr. Thorstad, Exhibit A8?

13 A. Yes, I am.

14 Q. All right. Is it true that Mr. Damon is no longer
15 with the company, which is the purpose -- the rationale
16 for adopting his testimony?

17 A. That's correct.

18 Q. All right. And I represented earlier today that we
19 were introducing the number of witnesses so you are
20 taking on Mr. Thorstad's testimony as well, Exhibit A8?

21 A. Yes, I am.

22 Q. Did you file prefiled Supplemental Direct Testimony
23 in this case?

24 A. Yes, I did.

25 Q. And do you recall that as Exhibits A6 and

1 attachments Exhibit A6-1 and A6-2?

2 A. Yes.

3 Q. All right. Did you also file Rebuttal Testimony in
4 this case on the 26th of September?

5 A. Yes.

6 Q. Do you recall that as Exhibit A7?

7 A. Yes, I do.

8 Q. All right. Can you please briefly summarize the
9 topics that you are covering in your testimony that's
10 been prefiled in this matter?

11 A. Sure. So the project's development in general and
12 the exhibits associated with that in the Application, as
13 well as the construction of the project.

14 Q. So if there are any commitments to be made on behalf
15 of the project, that would come from you?

16 A. Yes. I'm the one who combined the project.

17 Q. Do you have any updates or corrections to your
18 prefiled testimony?

19 A. Yes. I have three updates. One in which we agreed
20 with Staff's sound requests. Another involving an update
21 as to the start of construction of the project. And a
22 third related to the turbines for the project.

23 Q. Okay. Let me go back to number one with the
24 conditions with Staff. Did you mean all of the
25 conditions except for noise that we jointly offered with

1 Staff?

2 A. No. Sorry. All of the conditions -- all of the
3 conditions that Staff had and we agreed to.

4 Q. Okay. And that is Exhibit 32. Do you have that in
5 front of you?

6 A. I do not.

7 Q. And then also 33. And I'll ask if you agree with my
8 representation that 32 are the jointly agreed-to
9 conditions with Staff; is that right?

10 A. Yes. That's correct.

11 Q. And Exhibit 33 has two conditions on it, a proposed
12 sound condition and then one regarding turbine
13 flexibility that we'll get to here in a minute; is that
14 right?

15 A. Yes. That's correct.

16 Q. All right. Let's talk about the conditions that are
17 in Exhibit 32. Do you have any conditions that you would
18 like to highlight at this time?

19 A. Yes. So sPower agreed with Staff to limit the
20 shadow flicker on a residence not just to -- or sorry.
21 At a nonparticipating receptor to not just 30 hours a
22 year but also 30 minutes a day. I know that there was
23 some questions as to how that technology works.

24 In short, we know when shadow flicker's going to
25 occur on the receptor, and so what we do is we

1 automatically program the turbine to shut down a few
2 minutes prior to hitting the 30 minute a day and then to
3 start up a couple minutes after shadow flicker would have
4 ended. And that's how the control system works.

5 Q. Is that a manual system, or is it automatically
6 programmed?

7 A. So it's programmed at the start of the wind farm
8 operation, but then it operates manually -- or sorry. It
9 operates automatically. So there's no human intervention
10 necessary to shut down the turbine to stop shadow
11 flicker.

12 Q. What is your update with respect to the project's
13 anticipated start date?

14 A. So the project anticipates starting construction in
15 January after a federal environmental review related to
16 our WAPA electrical interconnection.

17 Q. And what types of activities would you anticipate
18 starting construction with?

19 A. So in January with the ground frozen prior to
20 restrictions during the fall occurring, we would expect
21 the construction of the 115-kilovolt transmission line,
22 as well as work on some of the project substation on
23 either end of that line.

24 There will be also improvements to roads that can be
25 done locally. Obviously, temperature and weather,

1 seasonal issues, are challenging.

2 Q. The third item you wanted to talk about was turbine
3 flexibility. Please explain what it is the Applicant
4 would like with respect to turbine flexibility?

5 A. Sure. So for up to nine turbines we'd like to have
6 the option, if necessary, to replace them with a
7 2.3-megawatt machine of the same manufacturer. And this
8 would be necessary if it was required to qualify for the
9 production tax credit or PTC.

10 Q. What is the size of the GE 2.3 turbine?

11 A. So the GE 2.3 turbine, 2.3 megawatts, an 80 meter
12 hub height, and 116 meter rotor diameter.

13 Q. And how does that compare, larger or smaller, to the
14 turbine model proposed for the project?

15 A. So it's a smaller turbine model. The current
16 turbine model sits at a hub height of 111.5 meters with
17 137 rotor diameter, and it's a 3.8 megawatt machine.

18 Q. When will Prevailing Wind Park be able to determine
19 whether the GE 2.3 turbine is needed for production tax
20 credit purposes?

21 A. On or before July of next year.

22 Q. How would the Commission address this proposed
23 turbine model change? Is that something that you've laid
24 out in Exhibit 33?

25 A. So yes. Under Exhibit 33 it lays out how we would

1 address the change in turbine as well as submitting the
2 necessary documentation to show that it complies with all
3 the conditions of the permit.

4 Q. Those conditions would include noise, setbacks,
5 cultural resources, wetland avoidance?

6 A. Yes. That's correct.

7 Q. Other than the updates that you've just noted, would
8 your answers to the questions in your prefiled testimony
9 be the same as if I asked you them here today?

10 A. Yes.

11 MS. AGRIMONTI: Mr. Pawlowski is available for
12 cross-examination.

13 MS. EDWARDS: Did you move to admit A --

14 MS. AGRIMONTI: A33 was part of the list of
15 exhibits that I believe were admitted earlier today.

16 MS. EDWARDS: I was referring to the one that
17 was objected to. I think it was A8.

18 MS. AGRIMONTI: Oh. Yeah. Thank you.

19 I would move admission of Exhibit A8 sponsored
20 by Mr. Pawlowski.

21 Thank you, Ms. Edwards.

22 MS. JENKINS: I'll object to that.

23 MR. DE HUECK: And would you like to share what
24 you're objecting to?

25 MS. JENKINS: My concern is I thought that

1 Mr. Thorstad would be testifying, and I expected to be
2 able to cross-examine him.

3 MR. DE HUECK: Your objection is noted for the
4 record. I'm going to overrule the objection and allow
5 Mr. Pawlowski to adopt the testimony of Keith Thorstad.

6 MR. ALMOND: And I would just join in that
7 objection.

8 MR. DE HUECK: So noted.

9 MR. ALMOND: For the same reason, that
10 Mr. Thorstad is not here to be cross-examined for the
11 testimony that he's submitted.

12 Or did I say Mr. Pawlowski? I meant Thorstad.

13 MR. DE HUECK: So, with that, A8 will be
14 admitted. And we'll begin cross-examination with
15 Mr. Almond. And you are free to cross-examine regarding
16 A8.

17 MR. ALMOND: It's all cross-examination; right?

18 MR. DE HUECK: Correct.

19 CROSS-EXAMINATION

20 BY MR. ALMOND:

21 Q. First and probably most important question, what
22 football game were you at?

23 A. I was at the Virginia Tech-Notre Dame game at
24 Virginia Tech.

25 Q. Who were you rooting for?

1 A. I went to a state university so I was rooting for
2 Virginia Tech.

3 Q. Okay. This new turbine model, when did it first
4 become -- when were you first put on notice that you
5 might be considering a different turbine model than the
6 GE 3.8 megawatt model?

7 A. I would say within the last couple of weeks.

8 Q. And was the potential to utilize the GE 2.3 megawatt
9 turbine model communicated on the docket on-line
10 anywhere? Do you know?

11 A. Not that I'm aware of.

12 Q. I want to jump into where Ms. Agrimonti was asking
13 you about Prevailing Winds.

14 And I understand that sPower purchased the asset
15 that is Prevailing Wind Park; is that correct?

16 A. Yes. That's correct.

17 Q. Were you involved in that purchase process?

18 A. Yes, I was.

19 Q. And who from Prevailing Winds did you have
20 interactions with?

21 A. So from Prevailing Winds I dealt quite a bit with
22 the board members, and I made a presentation to the, I
23 guess, shareholders.

24 Q. And, again, the question was who were those people,
25 to the best you can recall their names?

1 A. Sure. So in terms of board members, there was
2 Ron Hornstra and Eric, and right now his last name is
3 escaping my mind as well. And yeah. I believe Keith
4 Thorstad also sat on the board, but I could be mistaken
5 in that.

6 Q. Is it Eric Johnson?

7 A. Oh, Eric Johnson. Yes. Thank you.

8 Q. And you said you also presented to shareholders of
9 the project?

10 A. Yes. And it was a large audience of shareholders.

11 Q. And, again, I'm going to do the same thing I did
12 with Ms. Peters so just a yes or I don't know would be
13 sufficient.

14 A. Sure.

15 MS. AGRIMONTI: Mr. de Hueck, I'm going to
16 object to this line of questioning. I do not see the
17 relevance in who the investors are in the seller of the
18 project that is now being brought forward by a different
19 Applicant. Therefore, I don't believe we should take the
20 time at a hearing to hear whether he remembers who was
21 an investor or present at a meeting.

22 MR. DE HUECK: He's testified that he was
23 involved in this process. I'm going to allow Mr. Almond
24 to run through his list quickly.

25 Q. Doug Koupal.

1 A. I don't recall.

2 Q. Dennis Brandt.

3 A. I don't recall.

4 Q. Alfred Bartunek.

5 A. I can't recall.

6 Q. Arlo Dewald.

7 A. I don't recall.

8 Q. Mildred Roth.

9 A. I don't recall.

10 Q. Keith Raysby.

11 A. I don't recall.

12 Q. Paul Erck.

13 A. I don't recall.

14 Q. Rodger Brandt.

15 A. I don't recall.

16 Q. Dennis Powers.

17 A. I don't recall.

18 Q. Greg Hall.

19 A. I don't recall.

20 Q. Daryl Becvar.

21 A. I don't recall.

22 Q. Did sPower or Prevailing Wind Park negotiate with

23 any of the leaseholders?

24 A. Yes. We did.

25 Q. So explain that. Did you sign up new leases? Did

1 you renegotiate leases that were already signed up?

2 A. Oh, sure. So we signed up additional leases.

3 Q. How many additional leases did sPower sign up?

4 A. I don't recall off the top of my head. I would say
5 it was probably 30 or 40 percent of the total project
6 acreage and I would say the vast majority of the
7 115 kV line.

8 Q. I don't have the number in front of me. How many
9 lease agreements are there signed up for this project?

10 A. I don't know the number.

11 Q. Do you have any awareness or knowledge of other
12 future projects that are being planned in the area?

13 A. Apologies. Is this in general or --

14 Q. Yes. In general.

15 A. I don't have any particular knowledge, no.

16 Q. Okay. And given you've adopted the testimony of
17 Keith Thorstad, has he ever mentioned to you the
18 possibility of future projects in the area?

19 A. No, he has not.

20 Q. In your prefiled testimony you talked about the
21 county permitting processes. And I want to talk about
22 the Bon Homme County permitting process.

23 What approval did you get for the project in
24 Bon Homme County?

25 A. So for Bon Homme County we went before -- and I may

1 get the specific bodies crossed but the zoning board, and
2 they voted for -- or sorry. They voted in -- and I also
3 apologize if I get the three counties a little confused.
4 But I believe Bon Homme affirmed that we complied with
5 their ordinance -- sorry. We complied with their
6 permitted use under the statute.

7 Q. And can you refer to us in the docket where that --
8 evidence of that agreement exists?

9 And if you want to look to your counsels, I'm happy
10 if they provide it.

11 MS. AGRIMONTI: I will represent that it is in
12 Mr. Pawlowski's testimony. We have requested minutes
13 from that meeting, and we will submit them when they are
14 received.

15 And just for clarification, it's the County
16 Board of Commissioners, and it's the ordinance rather
17 than a statute.

18 Q. Would you agree with everything she just said?

19 A. Yes. I agree with everything she just said.

20 Q. So from Bon Homme County sPower received
21 affirmation from the Board of County Commissioners that
22 the project complies with their ordinances?

23 A. Yes. As I understand it.

24 Q. What about Charles Mix County? And I'll represent
25 to you that's the county that doesn't have zoning

1 ordinances.

2 A. Yes. So Charles Mix County does not have any zoning
3 ordinances so the approval sPower received was a building
4 permit for each of the turbines and I believe some
5 portion of the collector system.

6 Q. Did the county offer any other approvals for the
7 project aside from building permits?

8 A. The county did not offer any approvals.

9 Q. And I understand as part of the process with Charles
10 Mix County you on behalf of sPower, I believe, completed
11 an Affidavit and submitted it to Charles Mix County?

12 A. Yes. That's correct.

13 Q. Can you just explain why that was done?

14 A. The county didn't have zoning and wanted some
15 assurances on setback and sound and shadow flicker, and
16 so we signed an Affidavit binding the project to that
17 and, I believe, submitted it into the record for the
18 Commission.

19 Q. And was that submitted on the date that's on the
20 Affidavit? Did you sign it the same day it was submitted
21 at the meeting?

22 A. Yes. That's correct.

23 Q. I was going to ask you when the meeting was, but I'm
24 guessing you don't remember.

25 A. I don't remember the exact date. I'd have to look

1 at the Affidavit.

2 Q. So if we want to know what date that meeting was, we
3 could look at the Affidavit?

4 A. Yes. That's correct.

5 Q. When was the first time sPower Prevailing Winds
6 Project first went to the Charles Mix County Commission?

7 A. I'd be hard pressed to think of an exact date
8 because going to the Commission without any formal
9 hearing and sitting in and answering questions is
10 something that occurs all the time for wind development.
11 But certainly towards the beginning of this year.

12 Q. The beginning of 2018?

13 A. At the very least. Certainly it more than likely
14 also occurred in 2017 as well prior to sPower purchasing
15 the project.

16 Q. How many meetings did you -- how many county
17 commission meetings, actual meetings, did you personally
18 attend?

19 A. For Charles Mix?

20 Q. Yes. Sorry.

21 A. It had to be somewhere around seven or eight.

22 Q. And the meeting during which they considered your
23 Affidavit, I guess, walk the Commission through what
24 happened at that meeting.

25 A. Sure. So the idea of offering up an Affidavit

1 actually occurred probably three meetings before I signed
2 the Affidavit and submitted it to the Commission. It
3 wasn't a formal hearing of the project. Owned -- sPower
4 and myself as a representative executed the Affidavit and
5 gave a copy to the County Commissioners as well as
6 submitted it to the PUC.

7 And, you know, conversations took place between the
8 Commissioners as to what they wanted to include, what
9 they were looking for, what they thought were reasonable
10 setbacks, as well as numerous public comment periods.

11 Q. Was there a point in time during that meeting when
12 you and Commissioner Keith Mushitz stepped out into the
13 hallway to have a private conversation?

14 A. Yes. The Commissioner requested that I step out
15 into the hall.

16 Q. And tell us about that conversation.

17 A. The question was simply what was the closest
18 receptor to the turbines. There was quite a bit of noise
19 in the meeting. Once the conversation was over we
20 reentered the room.

21 I asked my attorney that -- I was uncomfortable that
22 I had met with the Commissioner outside of the room in a
23 public hearing, although no action was being taken by the
24 Commission on behalf of the project. And myself and then
25 the Commissioner recounted our conversation in front of

1 everybody in the room.

2 Q. And what was the answer to his question?

3 A. I don't -- so I think it was roughly 1,700 feet was
4 the answer.

5 Q. And by receptor what was he talking about?

6 A. So receptor just is for any of the noise receptors
7 that we have. That was what the reference was. The
8 noise and shadow flicker receptors.

9 Q. And that 1,700-foot distance for that receptor, do
10 you know whether that was a participating or
11 nonparticipating receptor?

12 A. Oh. Sorry. So that was a nonparticipating
13 receptor.

14 Q. Did you guys discuss anything else in the hallway?

15 A. No, we did not.

16 Q. When was the last time you spoke with Commissioner
17 Mushitz?

18 A. That same day.

19 Q. Following county -- or Charles Mix County's receipt
20 of your Affidavit, did the turbine layout change at all?

21 A. Yes. As was stipulated by previous testimony, a
22 turbine was eliminated, and two turbines were moved.

23 Q. Which two turbines were moved?

24 A. I don't recall.

25 Q. Do you know if Bridget Canty submitted prefilled

1 testimony describing the relocation, minor shifts, of a
2 couple of turbines?

3 A. I don't know the specifics of her testimony.

4 Q. Do you know approximately where the two turbines
5 were located at in the project that were relocated?

6 A. I do not.

7 Q. When were they relocated?

8 A. I don't know. Sometime recently.

9 Q. Who decides whether to locate or relocate turbines?

10 A. So sPower does. And depending on what the reason is
11 for relocation, that person makes the call on whether or
12 not it needs to be relocated.

13 My understanding was that because the turbines being
14 moved was a very small amount and well within the
15 discretion we're asking the Commission under the
16 Application to be able to move the turbines, for whatever
17 technical reasons the turbines were moved. And I did not
18 intervene or provide any input into it.

19 Q. Did you provide any sort of approval for moving of
20 them?

21 A. No, I did not.

22 Q. I'm sorry. What was your title for this project?

23 A. So I'm vice president of wind development for
24 sPower. So I oversee all of the development on the wind
25 side.

1 Q. A little bit about the project area. They had an
2 attachment or another map up, but --

3 MR. ALMOND: Can we just throw yours back up,
4 please.

5 Thanks, Mollie.

6 Q. How many acres are in the project area?

7 A. I don't know the exact amount of acres off the top
8 of my head.

9 Q. More than 50,000; correct?

10 A. That sounds about right.

11 Q. How many turbines are you guys proposing to build?

12 A. A maximum of 61.

13 Q. Can you repeat that answer, please.

14 A. A maximum of 61 turbines.

15 Q. And the setbacks from nonparticipant residences.
16 We're dealing with two different ones here; right? A
17 thousand foot and 2,000 foot, depending on the county?

18 A. It does vary by county. If I recall, I think
19 it's -- yeah. That sounds about right. I'd have to
20 review the specifics, but that sounds about right.

21 MS. AGRIMONTI: I would ask if Mr. Almond wants
22 to talk about a specific setback, that it be designated
23 as the type of setback and county in which we're
24 discussing.

25 Q. Approximately how many acres do you need to site a

1 turbine?

2 A. Each turbine takes up less than an acre. You
3 generally also include the access road associated with
4 it.

5 Q. But to account for setbacks and stuff, is there any
6 estimated number of acres you need to site a turbine?

7 MS. AGRIMONTI: Objection. Vague. I don't know
8 what setbacks he's talking about.

9 MR. DE HUECK: Did you hear Ms. Agrimonti?

10 MR. ALMOND: I heard the objection. I guess the
11 question is whether or not he thinks the question is
12 vague or whether he thinks he can answer the question.

13 MR. DE HUECK: And can you just ask a better
14 question?

15 MR. ALMOND: Yeah. Sure.

16 Q. When a developer like sPower is looking for a wind
17 development project or looking to develop a project, do
18 they have a number of acres per turbine that they're
19 looking at in order to develop their project?

20 A. No. That number varies greatly depending on what
21 the physical project actually looks like.

22 Q. Yeah. So does anyone from -- is there a number, I
23 guess? Is there any number that you look at to see if
24 you have -- you know, you've got a project area that's
25 50,000 acres. Are you able to look at that and estimate,

1 I wonder how many turbines we can put in 50,000 acres?
2 Or is there nothing in the industry that has that type of
3 formula or number?

4 A. A lot of information goes into what we can put in
5 terms of number of turbines. The local setback
6 requirements, noise, shadow flicker. Is the project --
7 what's the shape of the project area we have? Are we
8 along a ridge line? There's a lot of factors that go
9 into this.

10 Q. Right. So you don't have a general number of acres
11 for a turbine?

12 A. I do not.

13 Q. Okay. Take a look at Exhibit I-16. It's in the
14 binder to your right on top.

15 A. I have it open.

16 Q. Now I anticipate when Mr. Hubner testifies later in
17 this matter he's going to say that when he was approached
18 about signing up for this project that document was
19 provided to him, and it was represented to him that he
20 could have the possibility of having 12 turbines on
21 1,985 acres.

22 MS. AGRIMONTI: Objection. Relevance. This is
23 a lease that was not executed, offered by a party that is
24 not in this proceeding. Relevance.

25 MR. DE HUECK: I believe that's what the exhibit

1 states on it.

2 Go ahead, Mr. Almond.

3 Q. So if we take 61 turbines and if 12 of them can fit
4 on 1,985 acres, by my math that's about 20 percent of the
5 turbines can fit on 1,985 acres. You want to check the
6 math?

7 A. I'm sorry. Is there a question?

8 Q. Yeah. Would you agree that's what the math works
9 out to be?

10 A. No. I would not.

11 Q. Okay. So 12 divided by 61 is what? Approximately
12 20 percent; correct?

13 A. So I'd like to point out that on the document
14 before me it specifies that the size of the machine is a
15 2-megawatt machine. And sPower's proposed a 3.8-megawatt
16 machine with a rotor diameter of 137 meters. I can't --

17 I don't know the rotor diameter that was specified
18 for this 2-megawatt machine, so I don't know what the
19 spacing of it looked like. So there's not enough
20 information here to draw any conclusions.

21 Q. And that's a good point. Would you agree that that
22 type of information should be shared with people when
23 they're signing up for lease agreements?

24 A. When people sign up for lease agreements there's a
25 lot of conversations that are had, and generally we

1 always try to answer all of their questions, including a
2 range of turbines. But it's not always written down.
3 And certainly rotor diameter is a nuance that some people
4 want to know and others don't.

5 Q. And consistent with your prior testimony, about
6 70 percent of this project was signed up through
7 Prevailing Winds; correct?

8 A. I think I said 40 percent was signed up by sPower.
9 So I'd say it's closer to 60 percent, not 70 percent.

10 Q. Okay. So 60 percent of the project area or acres
11 signed up were signed up by Prevailing Winds; right?

12 A. Yes. The previous developer.

13 Q. Okay. And you have no knowledge of what
14 representations were made by Prevailing Winds to the
15 people signing up, do you?

16 A. Certainly as a part of our due diligence in the
17 project, we needed to understand what was said to the
18 landowners, what promises had been made, and to
19 understand what obligations sPower was stepping into. So
20 I feel comfortable that what was done and said all seemed
21 reasonable.

22 Q. Walk me through that due diligence because I need to
23 know that.

24 A. Sure. So as with anything, we review the
25 documentation, often ask to speak to landowners and

1 understand interactions with the community just to get a
2 sense.

3 Q. Did you speak with anyone from Prevailing Winds
4 about them signing up people?

5 A. Yes. They were involved in the transaction.
6 Certainly the previous developer -- so we spoke with them
7 about it.

8 Q. So as this due diligence process, you guys conversed
9 with those individuals who were going around and getting
10 people signed up on behalf of Prevailing Winds?

11 A. That's correct.

12 Q. And who are those individuals?

13 A. So that would be Eric Johnson and Ron Hornstra.

14 Q. As part of your guys' due diligence process, did you
15 speak with any other individuals other than Eric Johnson
16 and Ron Hornstra?

17 A. Roland Jurgens and Keith Thorstad.

18 Q. Aside from those four individuals as part of your
19 guys' due diligence process, did you speak with anyone
20 else?

21 A. At the previous developer? Not that I can remember.
22 Not to say that there wasn't a conversation that I don't
23 remember.

24 Q. And this due diligence process you discussed, you
25 said you had reached out to landowners to find out how

1 the negotiations took place with them. Which landowners
2 did you guys reach out to?

3 A. I don't recall.

4 Q. How many landowners?

5 A. I don't know that number off the top of my head.

6 Q. Okay. In your prefiled testimony you make the
7 assertion that a two-mile setback for nonparticipants
8 would eliminate the ability to develop a wind farm in the
9 project area.

10 Do you remember making that assertion?

11 A. Can you direct me to where that is in my testimony,
12 please.

13 Q. I can't. But does that sound like something you'd
14 say?

15 A. I believe --

16 Q. I believe it was in your Rebuttal.

17 A. I'd need to see the document. Please provide it.

18 Q. Go to your Rebuttal, please.

19 A. Can you direct me to which exhibit that is?

20 MS. AGRIMONTI: A6.

21 MR. ALMOND: I think it's A7.

22 MS. AGRIMONTI: A7. Sorry. A7 is the Rebuttal.

23 Q. A7, page 3.

24 And I'll strike the question actually, and I'll just
25 ask a general question.

1 Would a two-mile setback for nonparticipants be
2 viable for this project?

3 A. I haven't done and looked at the analysis.

4 Q. What about a mile and a half? Have you done that
5 analysis?

6 A. Actually I want to restate before. So there was
7 analysis done that was shared at the county showing the
8 different setbacks and what it would eliminate. I don't
9 have that on me.

10 Q. And I've seen that analysis, and it talks about
11 which turbines where they're currently placed would be
12 eliminated by certain setbacks; right?

13 A. That's correct.

14 Q. And my question is has there been an analysis
15 conducted about whether or not turbines in the layout
16 could be adjusted to comply with, for example, a mile
17 setback?

18 A. I'd like to make a correction there.

19 So the analysis that was done is it took
20 nonparticipating receptor, and it created circles around
21 it. So one mile, half-mile, two miles. So that analysis
22 was agnostic to the actual layout, although it did show
23 what turbines would be eliminated.

24 Q. And you said it was -- what were the different
25 distances showing the setbacks?

1 A. I don't recall exactly, but they were on mile
2 distances. I also don't recall if it was done
3 specific -- I believe it was done by sPower.

4 Q. So sPower provided the counties a document showing
5 what setbacks?

6 A. Sorry. Apologies. sPower did not provide the
7 counties with the setback. The setback was done by an
8 employee of the State of South Dakota. sPower provided
9 the GIS files that were used to create that. So turbine
10 locations, receptors, those types of files.

11 Q. So this South Dakota state employee, who is that?

12 A. Brian McGinnis.

13 Q. So Mr. McGinnis created a map showing different
14 setbacks around each receptor?

15 A. To my recollection, yes.

16 Q. And which county did he do that for?

17 A. It was for -- it was for Charles Mix. I don't
18 recall if it included the other two counties or not.

19 Q. So you don't recall if this analysis showing how
20 larger setbacks might influence the project was done for
21 the entire project?

22 A. That's what I stated.

23 Q. Okay. So back to the original question. I mean,
24 has sPower performed any sort of analysis attempting to
25 apply a one-mile setback for nonparticipants?

1 A. No. sPower took the setbacks that were specified in
2 each of the jurisdictions that we were in and applied
3 those setbacks.

4 Q. So you didn't try to use a three-quarter-mile
5 setback?

6 A. Correct. We did not -- we applied the setbacks for
7 the counties that we were in.

8 Q. So you don't know whether or not this project could
9 be approved with a larger setback for nonparticipants.
10 Is that an accurate statement?

11 A. sPower has designed the project around what the
12 counties had for setbacks and moved forward with that in
13 the layout and has provided that information in our
14 Application.

15 Q. I understand that. So but, again, if the Commission
16 were to adopt a three-quarter-mile setback, you don't
17 know whether or not that would affect this project's --
18 well, this project by where the turns are currently, yes,
19 but could the project be designed to account for larger
20 setbacks for nonparticipants?

21 A. I don't have the information to answer that
22 question.

23 Q. And that analysis wasn't performed because the only
24 analysis that was performed was using the setbacks that
25 existed for the respective counties; right?

1 A. That's correct.

2 Q. Do you know the number of occupied residences within
3 the project area?

4 A. I don't -- I don't know the exact number, but my
5 understanding --

6 Q. I'll help you.

7 A. Okay. Well, I was --

8 Q. Let's go to A14-1.

9 A. Okay. I'm there.

10 Q. And if you'd familiarize yourself with that
11 document. I think you can answer my questions. I think
12 just the first page probably goes through it.

13 (Witness examines document.)

14 A. I've familiarized myself with the document.

15 Q. Now how many occupied residences are there in the
16 project area or within a half-mile of the project area?

17 A. Apologies. I was looking for the project area, and
18 the half-mile threw me off.

19 It looks like, according to this exhibit, there was
20 a little over 160.

21 Q. Let me help you out here.

22 MS. AGRIMONTI: Yeah. I don't want this
23 information to be misrepresented either. It's an
24 exhibit for Ms. Canty, and he is asking Mr. Pawlowski
25 about it.

1 And the number's 146, 137 in the Application and
2 then 9 for the verification process. I don't think
3 that's in dispute.

4 MR. ALMOND: So 146 occupied residences within
5 the project area or a half-mile of the project area;
6 right?

7 MS. AGRIMONTI: Yeah. Or assumed documented,
8 yes. I can't tell you for sure there was somebody living
9 in the building, that Burns & Mac went out and made
10 judgment calls.

11 Q. For the purposes of the project, sPower assumed
12 146 occupied residences either within the project area or
13 a half-mile of the project area.

14 Are you with me?

15 A. This is -- I mean, this is outside of my testimony.

16 Q. Well, it sounds like your attorney's willing to
17 agree to 146 assumed occupied residences in that -- in or
18 around the project area.

19 Now in response to a data request that we sent over,
20 we asked the number of landowners that would have a
21 turbine on their property, and the response was 35. Does
22 that sound right to you?

23 A. Can you direct me to that document, please.

24 Q. Do you know how many landowners are going to receive
25 a turbine?

1 MS. AGRIMONTI: Objection. The witness has
2 asked very kindly for the document and not be tested on
3 his memory, and I think it's appropriate to have it
4 placed in front of him.

5 MR. DE HUECK: Yeah. Agreed.

6 MS. AGRIMONTI: Mr. Almond, if you could
7 identify which request you are identifying.

8 MR. ALMOND: Yeah. Turn to I-26 for me, please.

9 Q. If you'd turn to Data Request 1-14. The question
10 was, "Assuming all turbines are built, how many
11 participating landowners will have a turbine located on
12 their property?"

13 And it looks like you provided the information, and
14 the answer was 35 landowners; right?

15 A. That's correct.

16 Q. In providing that answer what did you look at?

17 A. In order to get that answer we utilized the --
18 basically the information in our GIS system and database
19 in order to pull which landowners the turbines fell on.

20 Q. Now go to Exhibit I-29 for me.

21 A. I've got it open.

22 Q. Do you see Data Request 4-2? It asks to "Provide
23 the names of the 35 landowners who will have a turbine on
24 the property. In doing so, identify the county in which
25 the landowner owns the land where the turbine will be

1 placed."

2 And the response was, "See Attachment 4-2"?

3 A. It was not my response, but I do see the response.

4 Q. Can you look over your shoulder at the map up there.
5 Does it say Attachment 4-2 in the top right-hand corner?

6 A. Yes, it does.

7 Q. So if we look at that map, we should be able to
8 identify the different landowners who are going to
9 receive a turbine; is that correct?

10 A. According to someone else's testimony in this
11 document, yes.

12 Q. Can we rely on Bridget Canty's testimony?

13 A. Yes. I'm just pointing out that this is not my
14 testimony.

15 Q. Of the stated 35 landowners who will receive a
16 turbine, how many reside within the project area or
17 within a half-mile of the project area?

18 A. I don't know the answer to that question.

19 Q. Is sPower able to get the answer to that question?

20 A. Where people live is a matter of public record so I
21 would assume it's with -- it's possible.

22 Q. So we can look at Attachment 4-2 over your right
23 shoulder there, look at all the landowners, and then
24 figure out whether or not those individuals reside in or
25 around the project area; right?

1 A. Yes.

2 Q. Okay. Going back to Exhibit I-29, 4-3. I know it's
3 not your responses. It's a response from Jessica Sauzna
4 [phonetic]. Who's Jessica Sauzna?

5 A. Sorry. Hold on just -- Jessica's an employee of
6 sPower on the land team.

7 Q. Okay. And I understand she gave this answer, but I
8 assume you can rely on Jessica; right?

9 A. Yes.

10 Q. And the question was asked how many lease agreements
11 were executed for the project.

12 Jessica provided that answer of 136 full-rights
13 agreements, five no-turbine lease, and three setback
14 waivers.

15 And for the benefit of the Commission can you
16 explain kind of those three different agreements?

17 A. Sure. So a full-rights agreement is a lease that
18 allows for landowners who wants to participate in the
19 fullest capacity possible for the wind farm, which would
20 include access roads, underground collector system, wind
21 turbines, project substation, all of the infrastructure
22 that's core to the project.

23 MR. ALMOND: No further questions.

24 MR. DE HUECK: Mr. Fuerniss.

25

CROSS-EXAMINATION

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BY MR. FUERNISS:

Q. Mr. Pawlowski, nice to see you again.

Would you say from your knowledge of the project area that there would, in fact, be potential for more wind energy development in that area?

A. First off, it's good to see you again as well.

So there's always a potential for wind energy development, depending on wind resource and other factors and what we consider the area. So the State of South Dakota certainly, and in those areas there is a wind resource that could be utilized.

Q. But you don't know at this time if there would be more plans for further development?

A. Yeah. I don't know. Other factors that go in are the transmission capacity. I know sPower doesn't have any plans for further wind energy development in the area.

Q. Okay. Thank you.

How much were you yourself involved in the development of the Application that was submitted to the PUC? Did you just oversee all the other people that put things together to go into that or --

A. So yeah. I mostly oversaw the people that put stuff together and weighed in as they requested my thoughts or

1 any large decisions affecting the project.

2 Q. I find it interesting in the Application in
3 Section 6.3, Consequences of Delay.

4 Now in light of some of the testimony that we heard
5 earlier today as far as consensus or nonconsensus, if you
6 will, on effects of shadow flicker and noise levels and
7 so forth, could there not potentially be benefits to
8 delay to the larger public?

9 A. I can't speak to that. What I can say is that we
10 have submitted an Application and all the information for
11 the project, and that's up to the Commission to make the
12 decision.

13 Q. All right.

14 Maybe this is a stupid question, but why in the
15 first place do you do all these studies and measurements
16 first for shadow flicker and for sound levels?

17 A. So the measurements are required under zoning in at
18 least one of the counties. And so as a part of meeting
19 the requirements that are set forth by the local
20 jurisdictions, we perform the studies that comply,
21 whether it's on a county or state or federal or municipal
22 level.

23 Q. I realize that you probably were not permanently
24 involved in going out and signing up any land. You said
25 something about a land team. I take it that's what they

1 do, go out and negotiate leases with people and so
2 forth?

3 A. That's correct. But I don't want to leave you with
4 the impression that I haven't met any of the landowners.

5 Q. Yeah.

6 A. I mean, I have tagged along for various meetings.

7 Q. So would you say that when you or the land team go
8 out and approach somebody, say, in rural Charles Mix
9 County, before you approach them do you think they have
10 much knowledge in general of wind farms or electricity
11 generation or any of these things that we're discussing,
12 potential hazards, potential effects, potential benefits?
13 Anything like that?

14 Have you discovered that the local folks are, in
15 fact, knowledgeable about these things before you
16 approach them?

17 A. So I would say obviously the level of understanding
18 varies. But given the number of local co-ops and
19 participation of folks and working with large equipment,
20 that the knowledge base seems pretty good.

21 But, obviously, you know, we're there to help
22 educate them on what the project is and to give them the
23 information that they need to make a decision.

24 MR. FUERNISS: Okay. Thank you.

25 MR. DE HUECK: Ms. Jenkins.

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CROSS-EXAMINATION

BY MS. JENKINS:

Q. Could you tell me, in your conversations with Keith Thorstad or Roland Jurgens has it ever been mentioned that they tried to sign up more easements around the project area?

A. Sorry. A quick clarification. Do you mean for the project or for another project?

Q. For another project.

A. So no.

Q. For this project?

A. Yes.

MS. JENKINS: Thank you.

MR. DE HUECK: Ms. Pazour.

MS. PAZOUR: No comment.

MR. DE HUECK: Staff.

MS. EDWARDS: Thank you. And I do have quite a bit so just a heads up.

(A short recess is taken.)

MR. DE HUECK: We're back in session.

Mr. Pawlowski is on the stand, and it is Staff's turn to cross-examine him.

CROSS-EXAMINATION

BY MS. EDWARDS:

Q. Thank you, Mr. Pawlowski. Who is your employer?

1 A. I'm employed by sPower.

2 Q. Okay. And turning to the testimony that you adopted
3 of Mr. Damon, page 1.

4 A. Do you know the exhibit to that?

5 Q. You can probably answer the question without
6 looking. He lists his employer as sPower Development
7 Company, LLC. Are those one in the same?

8 A. So, no, they're not. Let me provide better clarity.

9 So I'm employed by Sustainable Power Group doing
10 business as sPower. Sustainable Power Group owns sPower
11 Development Company, LLC. Mr. Damon incorrectly stated
12 his employer. He was employed by the same person as
13 myself.

14 Q. Okay. So sPower that you're employed with will own
15 Prevailing Winds?

16 A. SPower, which employs me, has a subsidiary called
17 sPower Development Company, LLC, and that entity owns
18 Prevailing Wind Park, LLC.

19 Q. Okay. I think I follow you. Thank you for the
20 clarification.

21 Turning to Mr. Damon's testimony, and I'll get the
22 number for you, I believe it's A6-3.

23 A. I have that open.

24 Q. When the tax benefits were calculated do you know
25 what capacity factor was assumed?

1 A. I would assume it's somewhere around 48 percent net
2 capacity factor. I would need to -- I'm trying to find
3 the exact number.

4 Q. So assuming 48 percent capacity factor, is that, in
5 your experience, reasonable for a wind farm or common for
6 a wind farm?

7 A. Yes. Wind farms can generally range from the low
8 30s to the low 50s, depending on what the wind resource
9 is, the age of the technology, and the location.

10 Q. So if a capacity factor ended up being lower in
11 reality, assuming the project was built, how would that
12 in general affect the tax benefits?

13 A. So my understanding is -- so my understanding is
14 that the State of South Dakota has two different taxing
15 mechanisms. One is a capacity tax, and the other is a
16 production tax. So a portion of that tax that would go
17 towards production would decrease.

18 Q. Thank you.

19 Turning to the calculated tax benefits to the
20 school, do you take into account local effort when you
21 calculate the tax benefits?

22 A. So my understanding -- and, again, if I have the
23 state law wrong, please correct me -- is that for the
24 first five years local efforts are not taken into
25 consideration, and then slowly from years six to 10 the

1 local effort is taken into account. And so it decreases
2 the money allocated from the State to the local
3 communities based on what they're getting off of the wind
4 farm.

5 And I'm sorry. I was describing the way the -- my
6 understanding of how the tax works. With respect to the
7 amount of money paid, the project benefits, I assume
8 you're looking on page 15 of 16. Is that correct?

9 Q. On page 15.

10 A. Yeah. 15 and 16.

11 Q. I don't know that I had a 16.

12 A. Oh, sorry. Yeah. There's two page numbers.

13 There's a page 15 of 16 and 16 of 16 are also referred to
14 as page 14 and page 15.

15 Q. Correct. Thank you. I have nothing further on that
16 line of questioning.

17 In your Rebuttal Testimony you discuss the county
18 level permitting status for the project; correct?

19 A. That's correct.

20 Q. And, for the record, what was the setback
21 requirement for Bon Homme County?

22 A. I believe Bon Homme -- sorry. When you asked for
23 setbacks do you want me to give you the whole list of
24 setbacks, or is there a particular setback you want me to
25 run through?

1 Q. Number of feet from nonparticipating residence.

2 A. 1,000 feet, to my recollection.

3 Q. And was that a not less than 1,000 feet?

4 A. I believe so.

5 Q. So would it be correct that a, say, 2,000-foot
6 setback would be not less than 1,000 feet?

7 A. That's correct.

8 Q. And, therefore, would be consistent with the county
9 ordinance?

10 A. That's correct.

11 Q. On page 3 of your Supplemental Testimony --

12 A. Sorry. What exhibit is that?

13 MS. SMITH: A7.

14 Q. Supplemental is A6.

15 MS. AGRIMONTI: That's correct.

16 Q. Do you have that in front of you?

17 A. I have Exhibit A7, which is my Rebuttal Testimony
18 from September 26 of this year.

19 Q. Okay. I think -- I believe I am looking at A6,
20 which is your Supplemental Testimony. Not rebuttal. And
21 then at about line 75.

22 A. Sorry. Is that -- that's just A6, no dash after it?

23 Q. Correct.

24 A. I've got that in front of me.

25 Q. Okay. So can you turn to line 75?

1 A. Okay.

2 Q. In that question you were asked about concerns from
3 members of the public over height of the proposed
4 turbines. Do you recall that?

5 A. I do.

6 Q. And your response was essentially that the project
7 is legally sufficient; correct?

8 A. That's correct.

9 Q. Do you have anything to add to that at this point
10 beyond what's legally sufficient to address those
11 concerns?

12 A. Sure. So what's not stated in here with respect to
13 the height is that the project is committed to installing
14 an ADLS system, pending the FAA allowing us to turn it
15 on. But we are installing an ADLS system, which sends a
16 signal to the FAA lights at night to stay off unless the
17 radar system, which is approved by the FAA, detects
18 an air draft within certain parameters. Then that signal
19 stops, and the FAA -- the lights will turn on on the top
20 of the turbines.

21 Q. Thank you.

22 Now turning to the discussion of shadow flicker.
23 Has this shadow flicker control equipment we've discussed
24 today been used on any projects you've worked on in the
25 past?

1 A. So for sPower, no. For projects I've worked on
2 prior to sPower, I honestly can't recall. But I would --
3 I would venture to say probably not.

4 Q. And pursuant to your testimony today, it's not a
5 manual shutoff; correct?

6 A. Correct. The system is programmed to turn off at
7 certain times. So in order for the machine not to be
8 turned off, there would have to be manual intervention.

9 Q. So how does a turbine know if it's getting close to
10 that 30 hour or 30-minute threshold?

11 A. So the turbine itself doesn't actually know. What
12 we have is the modeling. So the position of the sun is
13 well known, and so as was alluded to in previous
14 testimony, we actually know when and on what day homes --
15 or sorry -- receptors will have shadow flicker.

16 And so we can go in and program those dates and
17 times for the machine to shut off so that we don't exceed
18 those limits.

19 Q. And when you referred to that earlier testimony from
20 today, that was Mr. Anderson's correct?

21 A. That's correct.

22 Q. And were you here when he testified about an
23 assumption on sunlight?

24 A. Yes, I am. Or was.

25 Q. So if it's based off that assumption, what's the

1 failsafe for if the assumption understated the amount of
2 sunlight?

3 A. So we would need to be conservative in how we
4 program the system to function such that instead of a
5 machine starting to shut down exactly when we hit the
6 30-minute mark, that it starts shutting down earlier than
7 that to make sure that we're not exceeding that amount of
8 time.

9 Also the programming for the machine is designed
10 based on, you know, what we're assuming the sun's
11 position is. And so when we're actually programming the
12 machine we're not looking -- we're assuming that there is
13 no blockage of light.

14 Q. Will the shadow flicker equipment be installed on
15 all of the turbines or just some of them?

16 A. So all of the turbines it's a software feature. So
17 there's no physical equipment. It's computer programming
18 on a part of the control system which operates the
19 machines.

20 Q. Okay. And when you look at shadow flicker and how
21 to mitigate that, do you take into consideration the
22 sensitivity of a receptor?

23 A. We apply the same methodology to the receptors that
24 we've committed to. So once the receptor's identified
25 it's not treated any differently from any other receptor.

1 Q. So say a bedroom would be the same as a machine
2 shed?

3 A. If the machine shed is occupied as a receptor, yes.

4 Q. Okay. Could you please refer to Staff Exhibit S4.
5 And there should be a white binder up there that has all
6 of the Staff exhibits handy.

7 A. What I have is labeled A, B, C, and it has the
8 number 1 in it.

9 I have it in front of me.

10 Q. Thank you. Could you please turn to page No. 2 of
11 that exhibit? It should be Applicant's Response to Data
12 Request 4-2.

13 A. I have that page in front of me.

14 Q. The respondents to that question are listed as
15 Mr. Howell and Mr. Anderson; correct?

16 A. Yes. That's correct.

17 Q. Are you the appropriate company witness to make a
18 commitment based off of those responses?

19 A. Yes. I can make a commitment for the project.

20 Q. Judging by that response, it appears that the sound
21 levels at those residences range between 28 and 36 dBA.
22 Is that your understanding?

23 A. Yes. That's what I see on here.

24 Q. So could you commit at this time to the project
25 being built pursuant to those representations?

1 A. No.

2 Q. And why not?

3 A. The project meets and was designed around a
4 45 decibel requirement, and that's what the project is
5 committed to in all but one county.

6 Q. So isn't it a bit misleading then to put that as a
7 data request response for these participants?

8 A. This is the -- so no. This is the sound level that
9 the model shows at those locations.

10 Q. What could you commit to with respect to these
11 locations?

12 A. So we've committed to, in our Application, 45 dBA.

13 Q. Were you present for Dr. Roberts's testimony this
14 morning?

15 A. Yes, I was.

16 Q. And he stated that he knows of no basis for the
17 30 hours per year shadow flicker requirement; correct?

18 A. That's correct.

19 Q. Turning to Staff Data Request 6-1. Let me find that
20 for you.

21 A. I'm sorry. Can you say that one more time, please.

22 Q. Staff's Data Request 6-1. It should be in S5.

23 A. S5 is not in the book I have. It ends at S4.

24 (Counsel hands document to the witness.)

25 Q. Are you familiar with this document?

1 A. I don't believe so. I would need a minute to look
2 through it further.

3 Q. Okay.

4 (Witness examines document.)

5 A. No. This document doesn't contain any testimony
6 from myself, and I don't believe I've reviewed this prior
7 to the hearing.

8 Q. Were you the respondent to Staff Data Request 6-1?

9 MS. SMITH: Ms. Edwards, may I ask, is that a
10 set of all the responses in one? I'm wondering if he's
11 not turned to the right page that you're on.

12 A. Oh, page 23. I do know this one.

13 Q. Forgive me.

14 Were you the respondent to that data request
15 question?

16 A. Yes, I was.

17 Q. Can you please read the last sentence of your
18 response to 6-1.

19 A. "In addition, the project will comply with all
20 applicable shadow flicker requirements and commitments."

21 Q. Could you read the entire thing. I'm sorry. The
22 entire answer.

23 A. Sure. "Based on studies and documentation addressed
24 by testimony in Prevailing Wind Park, a shadow flicker
25 requirement of less than 30 minutes per day or 30 hours

1 per year is not necessary to avoid adverse impacts on
2 land use or health. See E.g., the testimony submitted by
3 Aaron Anderson and Dr. Mark Roberts. In addition, the
4 project will comply with all applicable shadow flicker
5 requirements and commitments."

6 Q. So in your answer you said refer to the testimony
7 submitted by Aaron Anderson and Dr. Mark Roberts. Do you
8 know which testimony you were referring to?

9 A. Off the top of my head right now, no.

10 Q. How about the last sentence when you said the
11 project would comply with commitments? If you can't
12 comply with the commitments in your data request answers,
13 which commitments are you complying with?

14 A. So there was the -- the data request was not a
15 request for a commitment. The data request was for
16 information as to what our model shows at the receptor
17 locations.

18 I've made two commitments. One, agreeing with Staff
19 on 30 hours a year and 30 minutes per day. And I've also
20 made a commitment in my Affidavit to Charles Mix County
21 to the same standard.

22 Q. Okay. And turning to the nine turbines you spoke
23 about earlier, when did you become aware that the project
24 might utilize different turbines?

25 A. Within the last couple of weeks.

1 Q. Thank you.

2 And then turning to Exhibit A33. Is it your
3 understanding then that Staff has not made any agreements
4 or commitments with respect to A33?

5 A. Please give me one second to pull it up.

6 So my understanding is that's what I was reading
7 from for the beginning of my testimony. So if you can
8 just give me a second to locate it to make sure I'm
9 referencing the correct document.

10 I have it in front of me now. Would you mind please
11 asking the question again.

12 Q. Is it your understanding with respect to A33 that
13 Staff has made no commitments or representations with
14 respect to this exhibit?

15 A. As far as I'm aware, that's correct.

16 Q. Thank you. When sPower purchased the project were
17 there any representations made in the purchase agreement
18 about whether turbines would be placed on certain
19 parcels?

20 A. No.

21 Q. So you maintained the ability to be flexible in your
22 siting at that time?

23 A. That's correct.

24 MS. EDWARDS: Thank you. No further questions.

25 MR. DE HUECK: Commission questions starting

1 with Commissioner Nelson.

2 COMMISSIONER NELSON: Thank you. The Affidavit
3 that has been referenced that you filed with Charles Mix
4 County, the commitments that you made in there regarding
5 setbacks and noise, et cetera, do these commitments apply
6 to the other two counties also?

7 THE WITNESS: No. Those commitments are to
8 Charles Mix.

9 COMMISSIONER NELSON: And why would you not
10 offer the same protection to the other counties for their
11 residents?

12 THE WITNESS: The other counties did not
13 request them and had setback ordinance and requirements.
14 Charles Mix did not have any.

15 COMMISSIONER NELSON: What is the setback
16 ordinance and requirement in Hutchinson County?

17 THE WITNESS: Hutchinson County, I believe, is
18 1,000 feet.

19 COMMISSIONER NELSON: I was curious about the
20 line of questioning that Ms. Edwards had with you
21 regarding the modeled noise levels at various receptors.
22 And she asked you what I thought was a pertinent
23 question, whether you would guarantee those, and you
24 adamantly refused and instead fell back on 45 dBA level.

25 That tells me that you are not confident in your

1 model, the accuracy of your model. Is that correct?

2 THE WITNESS: No. That's not the case at all.
3 The request was for us, or sPower, to specifically agree
4 to a dBA level for a limited number of people within the
5 project area.

6 If you take note, the Charles Mix agreement is
7 for a 43 dBA level, and that's for the entire county. So
8 to make a commitment -- I didn't feel it was proper to
9 make a commitment to specific landowners but rather we
10 make a commitment to the jurisdiction in which we operate
11 in.

12 COMMISSIONER NELSON: And understanding that you
13 operate -- I mean, you're under state jurisdiction as
14 you're sitting in front of us here so we may come up with
15 some different deal before this deal is done.

16 This issue of switching out nine turbines in
17 order to maintain your ability to access the PTC, I'm not
18 understanding that. Help me understand what that's all
19 about.

20 THE WITNESS: Sure. So there's two
21 methodologies for qualifying for the PTC under Treasury
22 rules. One of those is -- for this project is through
23 the construction of a main power transformer and doing
24 that work for the project.

25 The other way to qualify is to have spent

1 5 percent of the total project cost on the project. Both
2 of these items had to occur prior to the end of the year
3 in 2016.

4 And so the project has a transformer, which we
5 expect to qualify. However, the nine turbines would
6 represent the -- of the 5 percent of the cost of the
7 project.

8 COMMISSIONER NELSON: Okay. Thank you.

9 I want to delve just a little bit deeper into
10 this issue of the shadow flicker control mechanism that's
11 on your turbines. And I appreciate your explanation of
12 that.

13 But as I'm understanding it, I mean -- I guess
14 the question is does that use the same model as the model
15 used to estimate the shadow flicker?

16 THE WITNESS: So I don't know the exact answer
17 to that. What I would say is that we would look to
18 revise the model to make sure that it did not
19 inadvertently create assumption of cloud cover when there
20 could not be any. And so, therefore, the model we would
21 use actually would be conservative.

22 I would have to delve in more to the exact
23 determination of sky cover that was used in that model to
24 answer for the turbines, but for the model that we would
25 use we would assume zero sky cover at any point during

1 the day.

2 COMMISSIONER NELSON: So no cloud cover, 365
3 during the daytime; correct?

4 THE WITNESS: That's correct.

5 COMMISSIONER NELSON: Okay. Well, it probably
6 doesn't get anymore conservative than that so if that is,
7 in fact, the way it operates, I appreciate that.

8 You indicated that you're responsible for
9 development in general. And I've got a couple of really
10 kind of general questions, and I'm assuming you're the
11 best witness for those kind of questions. Is that
12 accurate?

13 THE WITNESS: Yes.

14 COMMISSIONER NELSON: He says with hesitation,
15 understandably.

16 In the state statute that we're all here about
17 that gives us the -- gives the Applicant the burden of
18 proof in order to obtain a permit -- and I'm looking at
19 49-41B-22, Subpart 2, and that says, "The facility will
20 not pose a threat of serious injury to the environment,
21 nor to the social and economic condition of inhabitants
22 or expected inhabitants in the siting area."

23 I want to ask you a couple of questions about
24 that.

25 It appears -- this Commission, frankly, has been

1 dealing with this project longer than you've been
2 involved in this project. This project or attempted
3 predecessors. And it appears to me, and I don't know if
4 there's anybody that's really going to disagree with
5 this, but that this project has already caused serious
6 injury to the social condition of the inhabitants in the
7 area.

8 Seeing that this may be disqualified already on
9 that basis alone, can you address that?

10 THE WITNESS: Well, I guess I don't -- I don't
11 under -- I guess I don't understand the statement.
12 Certainly there are Intervenors all the time for
13 projects, and so I guess I -- I don't see that in the
14 project.

15 COMMISSIONER NELSON: And so what you are
16 testifying is you've not observed any of the social
17 disruption that we think is happening in that area; is
18 that correct?

19 THE WITNESS: I just want to be clear. So what
20 I have observed is that there are people who are unhappy
21 about the project, and they are, you know, of similar
22 numbers that I've seen in other projects and other
23 interventions in projects. And so I haven't witnessed
24 social disruption.

25 But ultimately that decision is left up to the

1 Commission, and we've put together an Application with
2 all of our information for you to make a decision.

3 COMMISSIONER NELSON: Let me talk just a little
4 bit about the other parameter of that particular statute,
5 and that's the economic condition.

6 There's been a -- and maybe I'll ask you first.
7 Have you spent any time reading through the various
8 comments that were either made at the public input
9 meeting or that we have received as a Commission?

10 THE WITNESS: So I was present at the public
11 meeting and gave the presentation and sat through all of
12 the comments so I'm familiar with them.

13 I have perused the website and read through
14 comments. I can't represent that at this point I've read
15 all of them.

16 COMMISSIONER NELSON: Okay. I think based on
17 all of that you'll have a good flavor for where I'm
18 going. There's an individual by the name of Jerome
19 Powers that runs a hunting business. And a number of his
20 clients sent in comments saying if these go up, we don't
21 want to come to the area. He's very concerned about the
22 economic impact that this is going to have on his hunting
23 business, whatever that business is.

24 And while we don't have any of that formal
25 testimony as part of this proceeding yet -- maybe it will

1 come. I don't know -- how are we to wrestle with that
2 issue?

3 If this, in fact, does have a negative impact on
4 his business, on his economic ability to do his business,
5 why would that not be a disqualifier?

6 THE WITNESS: So to my knowledge, building wind
7 turbines does not adversely impact the ability to hunt or
8 have gaming operations in the area.

9 COMMISSIONER NELSON: Are you an expert in the
10 area of hunting and hunting lodges?

11 THE WITNESS: No. Absolutely not. I'm just
12 saying, to my knowledge, based on the wind farms that
13 exist, there doesn't appear -- I have not seen any study
14 or any data supporting the fact that there's an impact.
15 But I'm not an expert.

16 COMMISSIONER NELSON: I think the last
17 question -- and you heard it from me very early this
18 morning and I think it was Mr. Anderson punted to you on
19 this -- the issue of shadow flicker and 30 hours.

20 I mean, why is 30 hours acceptable and 31 is
21 not?

22 THE WITNESS: So I don't know the answer for
23 that. What I do know is that -- and I believe it's
24 Hutchinson County. It may be Bon Homme. But one of the
25 two the most stringent shadow flicker requirement they

1 can impose under their ordinances is a maximum of
2 30 hours a year. And I believe they have the discretion
3 of also requiring no more than 30 minutes a day.

4 And that is a common standard that you see. We
5 applied that standard to the project.

6 COMMISSIONER NELSON: So nobody really knows the
7 magic of 30. Is that what you're telling me?

8 THE WITNESS: I don't know it. And there was
9 testimony given today, but all I can say is that we
10 followed what the ordinance had and applied what was the
11 most stringent condition.

12 COMMISSIONER NELSON: And I appreciate that. I
13 suspect we're going to have some testimony that's going
14 to tell us that 30 is not the right number, and so,
15 obviously, I'm trying to figure out how do we document
16 that 30 is? And so I gave you the opportunity.

17 I think that's all the questions I've got.

18 MR. DE HUECK: Chairman Fiegen.

19 CHAIRWOMAN FIEGEN: Thank you.

20 I think I'm going to spend most of my time on
21 the prefiled testimony of James Damon because you are
22 adopting that testimony, I believe, and can answer these
23 questions for us; correct?

24 THE WITNESS: Correct.

25 CHAIRWOMAN FIEGEN: Okay. I'm probably going to

1 go all over the board so just forgive me. I have notes
2 everywhere. And, you know, I was just --

3 I was so confused about these nine turbines, and
4 I think Commissioner Nelson had you clarify that. It's
5 all -- it's all about a loophole of securing your federal
6 financial support.

7 THE WITNESS: So it provides a second avenue.
8 So in our view the project qualifies, but having the
9 flexibility to also use the secondary methodology is
10 something that we would like to preserve.

11 CHAIRWOMAN FIEGEN: Okay. And those turbines,
12 you were talking -- you know, sometimes I don't write
13 down fast enough because I know Reece was asking you
14 questions on his board over there. And I thought these
15 nine turbines, they were less --

16 No. 3.8 megawatts is the one you're looking at.
17 And then these nine are --

18 THE WITNESS: 2.3 megawatts.

19 CHAIRWOMAN FIEGEN: 2.3. Okay.

20 And what Reece was talking about over there was
21 the original land agreements were looking at that
22 2 megawatt or something; right?

23 THE WITNESS: So for clarification, there was a
24 sheet that the Intervenors have introduced, and it was an
25 exhibit that showed the calculation of turbines and

1 payouts at the top. It noted the assumption of a
2 2 megawatt machine.

3 CHAIRWOMAN FIEGEN: All right. I still need to
4 put the puzzle pieces together here because on Damon's
5 page 8 -- where is the 2,000-foot setback? Which county
6 is that? And is that a setback of a nonparticipating
7 resident?

8 It's been talked about today. I don't see it in
9 Damon's stuff on page 8.

10 There's been conversation today about a
11 2,000-foot setback. Nobody really clarified if it was a
12 resident or -- I mean, nonparticipating or participating.
13 Do you remember that line of questioning, and can you
14 help me understand?

15 THE WITNESS: I do. And I'm relatively certain
16 that this is where it comes from.

17 But in the Affidavit submitted to Charles Mix
18 County it specified 2,000 feet from a nonparticipating
19 landowner.

20 CHAIRWOMAN FIEGEN: Okay. So that was after
21 Damon's prefiled testimony.

22 THE WITNESS: That's correct.

23 CHAIRWOMAN FIEGEN: Damon also talks on page 12
24 a little bit about telecommunications.

25 Did you work with the telephone company, and do

1 you have any issues with copper or anything there in that
2 area?

3 THE WITNESS: So our understanding is that there
4 is fiberoptics in the area, which will be relatively easy
5 to bring into the facility.

6 CHAIRWOMAN FIEGEN: So the local telephone
7 company has no issues.

8 THE WITNESS: I can't testify to that. I can
9 just say the service that the project needs to operate is
10 available in the area.

11 CHAIRWOMAN FIEGEN: Okay. So Damon talked about
12 microfitting, and you guys have asked for 500 feet. As
13 you may know -- I don't know if you know this so you can
14 just clarify if you do -- the Commission continues to
15 secure more information every time we have an
16 evidentiary hearing.

17 These evidentiary hearings are new for this
18 Commission. The dynamics have changed in South Dakota.
19 And evidentiary hearings are now becoming the norm. So
20 we have changed our microfitting feet on two dockets so
21 far. Are you aware of that, and 500 feet is not part of
22 the other two agreements?

23 THE WITNESS: I'm aware that the Commission has
24 put set limits on other projects for micrositing the wind
25 turbines. And I'm fairly certain and know that it's less

1 than 500 feet.

2 CHAIRWOMAN FIEGEN: Okay. Thank you.

3 Also on page 12 of his testimony he talks a
4 little bit about safety. The Commission certainly is
5 very interested in safety. And are you providing a
6 safety manual to the Commission on now the two turbines
7 that you have selected?

8 THE WITNESS: So we've provided the Commission
9 with a safety manual for the 3.8 megawatt machine and can
10 also submit a manual for the 2.3 megawatt machine.

11 MS. AGRIMONTI: May I interject, Chair? I
12 apologize. We do have the safety manual and the
13 operations manual available for the 3.8 machine.

14 What General Electric has advised us is that we
15 can submit it to the Commission as confidential
16 information, but they would restrict access for attorneys
17 eyes only for parties. We need to have a discussion on
18 that.

19 Nobody so far has asked us to do that, but we do
20 have it available and can provide it to the Commission.

21 CHAIRWOMAN FIEGEN: I have to ask my advisor a
22 quick question if I can ask you this. So just wait one
23 second.

24 (Pause.)

25 CHAIRWOMAN FIEGEN: The attorneys are over

1 there, the advisors here. So here we go. My attorneys
2 will have to gavel me if I can't ask this.

3 So will you get us information on the safety --
4 and if it's confidential, that's fine. The safety
5 information for the feet of ice throw and the safety
6 issues on that?

7 MS. AGRIMONTI: Sorry to interject again. There
8 is a public document regarding ice throw and blade throw
9 setback considerations that's already been placed in the
10 record. It is in responses to Intervenors' Data Request
11 Set No. 4. I'm not sure I have the document number, but
12 I'll get it for you, the exhibit.

13 I may have to come back to it, but I will get
14 it. There is a public document and, as I mentioned,
15 there are the confidential documents that if the Chair is
16 requesting them, we will submit.

17 CHAIRWOMAN FIEGEN: Great. Thank you.

18 Also now I can't remember where this testimony
19 was so -- there is so much paper. And my memory is not
20 as good as it used to be, and I blame my two boys for
21 that. And now my husband, of course.

22 (Discussion off the record.)

23 CHAIRWOMAN FIEGEN: Someone testified that in
24 order to avoid struggles or an issue with your PPA, was
25 it like the fourth quarter everything had to be built in

1 2019 or the PPA was null and void?

2 I'm sorry. I can't remember exactly who
3 testified on that, but I thought it was in some of your
4 information that one of the three of you testified on.

5 THE WITNESS: Sure. So we're required to
6 deliver power at the end of 2019.

7 CHAIRWOMAN FIEGEN: And so you know we have lots
8 of rights in South Dakota. So if that doesn't happen by
9 the end of 2019 and you don't deliver that power, then
10 the PPA is null and void? Is that what the testimony
11 that I read -- when I read it I'm going like, that's how
12 I understood it, how it was written.

13 THE WITNESS: I would need to see the testimony
14 specifically, but there are various commercial remedies
15 and items that I'm hesitant to get into because of the
16 confidentiality restrictions in the PPA.

17 So I guess that's kind of where I'll leave my
18 statement.

19 CHAIRWOMAN FIEGEN: Those are my questions until
20 Commissioner Hanson and all my advisors are done asking
21 questions. I might come back.

22 MS. AGRIMONTI: I will note that the exhibit I
23 was trying to find was I-28, which includes setbacks and
24 is a public document from General Electric.

25 COMMISSIONER HANSON: Good afternoon,

1 Mr. Pawlowski.

2 THE WITNESS: Good afternoon.

3 COMMISSIONER HANSON: I understand you're
4 adopting the Thorstad and Damon and your own testimony.
5 Is there anyone else's?

6 THE WITNESS: No. That's the only testimony.

7 COMMISSIONER HANSON: Anyone else's you'd like
8 to?

9 THE WITNESS: No.

10 COMMISSIONER HANSON: Okay. Are there any
11 changes you want to make to any of those?

12 CHAIRWOMAN FIEGEN: You sound like an attorney.

13 COMMISSIONER HANSON: Well, we always give you a
14 chance to change them before we ask the questions. You
15 hesitate.

16 THE WITNESS: There's nothing that comes to mind
17 off the top of my head, but if there's an error in the
18 testimony, I'll correct it.

19 COMMISSIONER HANSON: All right. Forgive me
20 ahead of time. I haven't had a chance to -- we've
21 received eight or nine e-mails today with information and
22 additional filings. And, of course, we received
23 Exhibit A32, the permit conditions that were jointly
24 proposed and agreed to.

25 So if I miss something on there, if we miss

1 something on there, please forgive us for it because some
2 of us haven't had a chance to read through all of this
3 information today while we're going through the
4 evidentiary hearing.

5 I'm going to also start with Mr. Loren -- Damon.
6 Mr. Damon's testimony. And you don't have to turn to the
7 page, however, on page 10 of his testimony he talks about
8 practicable. And that's a very uncomfortable word.

9 THE WITNESS: Sorry. I didn't hear it.

10 COMMISSIONER HANSON: Practicable. Well, I'll
11 read the sentence or at least a portion of it.

12 "Wetland impacts are avoided to the greatest
13 extent practicable and all other applicable regulations
14 and requirements are met." That means that you're going
15 to meet some requirements, but we'll see whether you can
16 meet the other ones.

17 That word has created some -- well, that
18 qualification has created some discomfort for us in the
19 past. So when you're putting your regulations together
20 or your suggestions, rather, we appreciate you avoiding
21 words of that nature, adjectives.

22 On page 11 you refer -- or excuse me. Well,
23 it's your testimony now. You refer to, "During this time
24 a maintenance crew will be on-site 24 hours a day."

25 In the past when we've worked with wind farms

1 on -- well, pipeline companies, et cetera, on-site has
2 given different meaning, and I'm curious what is on-site?

3 THE WITNESS: Sure. It would be helpful if I
4 could look at the exact wording. Do we know which
5 exhibit?

6 COMMISSIONER HANSON: It's on page 11 of
7 Mr. Damon's.

8 THE WITNESS: Sure. Do you know the page
9 number?

10 COMMISSIONER HANSON: No, I do not.

11 MS. AGRIMONTI: A6-2. How about A6-3.

12 THE WITNESS: So in specification on the
13 maintenance crew and what it means -- so I would first
14 identify the fact that the wind facility is monitored
15 from three separate locations; one on-site at the
16 operation and maintenance building, one in Salt Lake
17 City, Utah where our remote operations center is, and
18 then another, because this is a GE project, will be at
19 GE's operation in, I believe, Schenectady, New York.

20 We will have the ability to dispatch somebody
21 24 hours a day, but I would not say that the maintenance
22 building is going to be occupied 24 hours a day but
23 rather there is somebody on call that can respond to
24 issues.

25 However, the turbines are monitored 24 hours a

1 day by sPower by people in our remote operations center
2 in Salt Lake City.

3 COMMISSIONER HANSON: Thank you. You covered
4 that very well with the exception of -- and you covered
5 everything I was curious about with the exception of I'm
6 assuming that that individual or individuals who would be
7 occupying the O&M facility, they're not going to be
8 housing there 24/7, of course, but how close to that
9 facility do you anticipate that they will be housing?

10 THE WITNESS: So depending on whether it's
11 an issue with the turbines or a high-voltage issue with
12 the substation, we have people on call that are able to
13 respond. And, again, depending on the situation,
14 certainly within two hours, sometimes -- depending on
15 what the issue is, it can be within 30 to 45 minutes. It
16 depends on what the item is.

17 If it is the functioning of a turbine, the
18 turbine is shut down until somebody can go out and
19 address whatever it is, if it's visual inspection. So
20 but, again, it depends on what the issue is that's being
21 experienced on-site.

22 COMMISSIONER HANSON: Thank you.

23 On page 14 of Mr. Damon's testimony he refers
24 to -- on line 398. And I don't know if your --

25 THE WITNESS: I have it.

1 COMMISSIONER HANSON: Is it structured that way
2 for you?

3 THE WITNESS: Yes, it is.

4 COMMISSIONER HANSON: Okay. The first line
5 states, "Prevailing Wind estimates that \$220,000 of food,
6 supplies, and fuel would be purchased locally by the
7 project and project staff annually (or 20.4 million over
8 the life of the project)."

9 The life of the project, however, is for
10 30 years, and 220,000 times 30 would be 6,600,000, not
11 20,400,000. So I was confused by that. Can you help me
12 with that?

13 THE WITNESS: Sure. When I look -- and it's
14 an obvious math error, I would -- I would have to sit
15 down and look at the exact numbers of where it came out.
16 There is -- well, for one -- I'd have to sit down and
17 look at the math and how it got there. But I agree with
18 you.

19 COMMISSIONER HANSON: Okay. If you'd get back
20 to us on that, I appreciate it. All of the figures on
21 the next page work out to a 30-year basis. They're all
22 correct. So that threw me off a bit. Appreciate you
23 getting back to us on that.

24 Jumping to -- let's see if I have the right
25 testimony. Mr. Thorstad's testimony, prefiled, excuse

1 me, I'm curious if each individual turbine will contain
2 emergency power supplies to allow remote operation of the
3 control systems.

4 I believe it did, but it doesn't specifically
5 say that, that I can find anywhere. But I believe from
6 the discussion so far at least I'd reach that conclusion,
7 but I haven't heard positively that it does.

8 THE WITNESS: So, yes, that's correct.

9 COMMISSIONER HANSON: Thank you.

10 On the directional drilling through the wetland
11 areas, will that be done with conduit and then have the
12 wiring go through the conduit?

13 I'm referring to on page 3, "Will the collection
14 system be installed underground?" And it explains that
15 there will be some directional drilling.

16 THE WITNESS: I would not expect us to install
17 conduit unless there was some other feature that required
18 it. But it would be just insulated cable drilled through
19 and pulled.

20 COMMISSIONER HANSON: These will be in wetland
21 areas and in streams? You will still go through the
22 process without conduit?

23 THE WITNESS: So my expectation would be that it
24 would be deep enough in the ground that the conduit
25 wouldn't be necessary. However, if during

1 construction -- the decision could also be made that
2 conduit is necessary for some or all of them.

3 I'd also like to point out that I do not know
4 the requirements in the State of South Dakota so it could
5 be possible a conduit is required. But, obviously, it's
6 in our best interest, and we want to build the best
7 project possible for reliability in operations.

8 COMMISSIONER HANSON: Thank you.

9 On page 4 I see you're not using guy-wires for
10 met towers. I appreciate that for the avian purposes.

11 You state that the towers will be lit. The
12 towers would be lighted and painted as necessary to
13 provide -- they will -- what color will they be? Do you
14 know?

15 The light. Not the tower itself but the --

16 THE WITNESS: Or sure.

17 COMMISSIONER HANSON: Are they the typical red
18 light?

19 THE WITNESS: Yes. It's a red light. Also
20 please understand that the met tower is tied into the
21 ADLS system, which suppresses the turbine lights as
22 well.

23 COMMISSIONER HANSON: Are you familiar that --
24 there's a theory at least, and I don't know how strong it
25 is, that with whooping cranes that they are attracted to

1 a red light?

2 THE WITNESS: I am not familiar with that, no.

3 COMMISSIONER HANSON: Ms. Canty, I believe? Is
4 that who will be testifying on -- she's here; right? I
5 see her in the back so I'll ask her. She'll have an
6 opportunity to check that out.

7 On page 5 discussing the personnel, it refers to
8 245 jobs during construction at peak demand. Do you know
9 how many job hours are involved here?

10 Because if someone works for -- you know, you
11 have 40 people who work for a month and you say, wow,
12 40 jobs are being produced, it's not the same as a year's
13 worth of work there so --

14 THE WITNESS: So I -- we do have that data and
15 what the expectation is during construction. I do not
16 have that at my fingertips but can certainly provide it.

17 COMMISSIONER HANSON: I'd like that if you
18 would. Thank you.

19 I'm going to jump to your testimony. I already
20 asked some of these questions so I'm going -- I had
21 intended to ask the same question of different
22 individuals just to see if you were consistent, and
23 you've been consistent so far so I won't ask you the same
24 questions.

25 There was some disagreement -- and, again,

1 forgive me if this has already been set forth in the
2 Exhibit A32. There was some disagreement regarding the
3 decommissioning of wind turbines. And I believe you came
4 up with a -- well, I won't describe your position in
5 comparison to the one that Darren Kearney of staff was
6 relating, but is that part of the agreement? Have you
7 folks reached an agreement on what the decommissioning --
8 the escrow account would be for decommissioning and how
9 that would be structured?

10 THE WITNESS: Yes. We agreed to the
11 structuring. Or as far as I know from last Friday, we
12 agreed to what it was at that point.

13 COMMISSIONER HANSON: All right. Thank you.
14 And thank you for your testimony. Those are all the
15 questions I have.

16 MR. DE HUECK: Redirect.

17 MS. AGRIMONTI: Possibly may be able to avoid
18 redirect depending on --

19 MR. DE HUECK: I'm sorry. Commissioner Fiegen
20 has an additional question.

21 CHAIRWOMAN FIEGEN: I just need to go back to
22 Commissioner Hanson's question on on-site.

23 Damian [sic] in his prefiled testimony on
24 page 11 -- and he's the one that talks about the
25 maintenance crew will be on-site. And that's what

1 Commissioner Hanson talked about 24 hours. And then
2 Commissioner Hanson talked about what does on-site -- and
3 can you clarify that.

4 But when I look at this, I mean, he certainly
5 states that it's from the O&M maintenance building. Is
6 that what it looks like to you?

7 THE WITNESS: That's how I read the testimony,
8 yes.

9 CHAIRWOMAN FIEGEN: But that's not how it's
10 going to be. Is that what you said to Commissioner
11 Hanson?

12 THE WITNESS: Correct. So with respect to the
13 O&M building, while it is a staging area and a location
14 that we -- and it's the operation and maintenance staff.

15 While that is a staging area, even during the
16 day often the folks who are operating and maintaining the
17 facility are not in the building but rather are on-site
18 at turbines, in turbines, at nacelles, at a substation
19 doing work, as opposed to a single location.

20 The single location monitoring is really handled
21 out of Salt Lake, although they have the ability to log
22 in and see any of the computers they want -- or I'm
23 sorry. Any of the turbines they want from their
24 computer. But the maintenance is occurring at the
25 machines.

1 CHAIRWOMAN FIEGEN: So I made an assumption that
2 the next paragraph that talks about eight to 10 full-time
3 jobs -- are those full-time jobs in the project area, or
4 are they in a different state?

5 THE WITNESS: No. So those -- those jobs are
6 people who their address for work is the O&M building.
7 That is where they go every day. That is where they
8 change. That's where they get their tools. They are
9 people locally or that live locally and going there for
10 work.

11 That does not take into account anybody that is
12 associated with the facility that is remote.

13 CHAIRWOMAN FIEGEN: So then why does it take two
14 hours to respond to an issue? Why would they be two
15 hours away? Wouldn't you keep someone --

16 I mean, it's just like pipeline safety. And I
17 know it's different. It's a different issue. But there
18 could be fires or whatever the case could be.

19 THE WITNESS: So we wouldn't look to keep
20 somebody two hours away. And when I spoke to the
21 response I meant to the location of the response time.

22 So depending on what the issue is, we would have
23 a different response time by when we wanted somebody from
24 O&M to get there. Obviously, as soon as possible is
25 always preferred, but the question is, you know, what's

1 the severity of the issue, and what's the response time
2 that's needed?

3 CHAIRWOMAN FIEGEN: And my very last question
4 and I know Ms. Edwards talked a little bit about it but
5 it's Mr. Damon's response on the school district's
6 \$371,000 annually in taxes paid.

7 Is that the whole 30 years of that area
8 school's, or is this misstated and it's really -- it goes
9 to the state, to the state school aid formula in a
10 graduated way from year five to year 10 and then after
11 year 10 it's all in the state aid school formula?

12 THE WITNESS: So all of the money goes to the
13 school, and then there is a graduated, as it's offset.
14 But that money is going to the school, but as the local
15 contribution starts to be taken into consideration for
16 what the state's funding there is graduation. However,
17 that money is still going into the schools.

18 CHAIRWOMAN FIEGEN: Yeah. I guess technically,
19 but probably not with the local people. It's not above
20 and beyond what they're -- so, technically, you could --

21 You know, there's all legal issues and
22 statements, but I don't think your local citizens might
23 necessarily always agree with a legal response because
24 that above and beyond money that sometimes is stated
25 isn't there anymore after year 10.

1 THE WITNESS: That's correct. And that's my
2 understanding as well.

3 And certainly I've been conscious in the
4 community of talking about it in the graduated way. And,
5 of course, that conversation with people locally is
6 different than providing on-the-record testimony, which
7 has to be precise.

8 CHAIRWOMAN FIEGEN: Okay.

9 MR. DE HUECK: Further cross-examination,
10 Commissioner Hanson.

11 COMMISSIONER HANSON: Don't sound so excited. I
12 just have one additional question.

13 Would Prairie Winds be willing to shut down
14 operations during the whooping crane migration?

15 THE WITNESS: Sorry?

16 COMMISSIONER HANSON: Prevailing Winds. Excuse
17 me. Or Beethoven, Crocker.

18 THE WITNESS: We've not made any commitments to
19 that, and the conversations that have been had with U.S.
20 Fish & Wildlife Service I'm probably not the best person
21 to speak to those. It falls outside of my testimony --
22 outside of my expertise.

23 I have not been a direct party to them, but we
24 do have others testifying who I believe could provide the
25 information you're looking for.

1 COMMISSIONER HANSON: But that person would be
2 subject to your thoughts and appraisal.

3 THE WITNESS: Correct. So pending that
4 testimony, I mean, right now, no. I would not make that
5 commitment to shut down during whooping crane migration.

6 But, obviously, there will be additional
7 testimony and conversations so it's something that I'd be
8 happy to revisit. And it would also require additional
9 analysis on my part.

10 COMMISSIONER HANSON: Would you agree that every
11 block in the foundation has to be cemented in in order
12 for the permit to be approved?

13 THE WITNESS: Yes. So we would -- we would make
14 this commitment -- as I said, I'm not inclined to make
15 this commitment now. I understand you would want to know
16 whether or not we would make that commitment prior to the
17 issuance of the permit.

18 But, you know, as with the additional
19 information I'm going to provide, that can be a part of
20 it.

21 COMMISSIONER HANSON: Thank you.

22 COMMISSIONER NELSON: I was not planning to go
23 down this road at all, but I've got to follow up on
24 Commissioner Hanson's question.

25 My understanding is that normal operating

1 procedure for wind farms is that if a whooping crane is
2 spotted in the area, that the farm shuts down. Is that
3 your normal operating procedure?

4 THE WITNESS: So I'm not aware of that as an
5 operating condition. I would say that the migration
6 question was a little different.

7 COMMISSIONER NELSON: Absolutely. I'm asking a
8 more targeted question.

9 THE WITNESS: Yeah. So I don't know what the
10 normal operating procedure is from U.S. Fish & Wildlife
11 that sPower has committed to and what's done. But we do
12 follow the recommendations and the guidelines of U.S.
13 Fish & Wildlife Service and work with them on the
14 operation of the facility.

15 COMMISSIONER NELSON: And which of your
16 witnesses would be able to speak to that?

17 THE WITNESS: Bridget Canty would be the one to
18 speak to that.

19 COMMISSIONER NELSON: Thank you.

20 MR. DE HUECK: I'm going to ask you if you want
21 to redirect, but I think you had something you wanted to
22 say.

23 MS. AGRIMONTI: Thank you. I can do it by
24 redirect, but I don't believe what I have to say is
25 controversial.

1 I believe the Chair was asking some questions
2 about turbine flexibility, and Mr. Damon's testimony had
3 the 500 feet from the application. The Applicant has
4 since agreed to a 250-foot flexibility, and that's in the
5 Condition No. 23.

6 Also Mr. Pawlowski was asked about a setback
7 requirement, and he couldn't recall if it was Hutchinson
8 or Bon Homme. I'll represent as a matter of law
9 Hutchinson doesn't have any setbacks so it must be
10 Bon Homme.

11 MR. DE HUECK: Now any redirect?

12 MS. AGRIMONTI: Not unless somebody objects to
13 what I just said.

14 MR. DE HUECK: Mr. Almond, recross based on
15 Commission questions?

16 RECROSS-EXAMINATION

17 BY MR. ALMOND:

18 Q. I don't remember who asked the question, but did you
19 testify earlier that your land team was still out signing
20 up easements for this project?

21 MS. AGRIMONTI: Objection. That is outside the
22 scope of the Commissioner questions.

23 MR. DE HUECK: I believe she's correct. That
24 didn't come up during Commission questions.

25 Q. So sPower hired Burns & McDonnell; right?

1 A. Burns & McDonnell.

2 Q. Specifically, Chris Howell to go do a sound
3 analysis; right?

4 A. Yes.

5 Q. Or noise analysis. And Aaron Anderson who did a
6 flicker analysis; right?

7 A. Yes.

8 MS. AGRIMONTI: Again, I'm going to object. I
9 do not recall the Commissioners asking any questions
10 about the --

11 MR. ALMOND: This will go into the line of
12 questioning that Commissioner Nelson started off with.

13 MR. DE HUECK: Which was what?

14 Yeah. Just ask your question.

15 Q. Yeah. So Commissioner Nelson asked about committing
16 to the sound flicker levels and noise levels predicted by
17 Mr. Howell and Mr. Anderson. And earlier we heard
18 Mr. Anderson testify that he predicted the worst-case
19 scenarios for the project when it comes to shadow
20 flicker.

21 If you look at Mr. Howell's report, he has the same
22 language actually, provided the worst-case predicted
23 sound pressure levels for the given receptors.

24 So if both of those individuals predicted the
25 worst-case levels for all of the receptors, why aren't

1 you willing to commit to those values for the sound
2 analysis or the flicker analysis at each receptor?

3 A. So, as was asked and as I answered to the
4 Commissioner, we agreed to a decibel level of 43 for the
5 county of Charles Mix, and we've applied the Bon Homme
6 standard to Hutchinson County as well. And so we've made
7 commitments to the county and the regulatory body, not
8 for individual receptors.

9 Q. And you're representing to the Commission through
10 your two experts, Mr. Howell and Anderson, that this
11 project as built worst-case scenario are those values in
12 their two reports at each receptor?

13 A. What we're representing is what's in the report and
14 what's been provided. And that's -- that's what the
15 report showed.

16 Our commitment is to 45 decibels in Bon Homme and
17 Hutchinson and 43 in Charles Mix for nonparticipating
18 receptors.

19 MR. ALMOND: I have no further questions.

20 MR. DE HUECK: Mr. Fuerniss?

21 MR. FUERNISS: I guess I have a little bit of a
22 question. I think Commissioner Fiegen brought this up
23 about the original land agreements.

24

25

RE CROSS-EXAMINATION

1
2 BY MR. FUERNISS:

3 Q. Do you recall how much land -- what the amount of
4 acreage was before sPower became involved, what had
5 already been leased?

6 I think you said a percentage, something like that,
7 but do you know what the amount of land might have
8 been?

9 A. I don't know the acreage off the top of my head. I
10 think I represented that about 60 percent of the project,
11 excluding the 115-kilovolt line, was under lease.

12 Q. Okay. Would you have any idea where in that map
13 that original 60 percent or so may have been? Was it
14 more in one area of the project footprint than another?

15 A. I do not have that information.

16 Q. Would you know anything about a map that is in
17 Exhibit I-18?

18 MS. AGRIMONTI: Mr. de Hueck, I've let a few
19 questions go by. Again, I believe this is outside the
20 scope of the Commissioner questions.

21 MR. DE HUECK: Well, I recall Kristie asking
22 about the percentages. And so I'm going to allow him
23 to -- I think he's still trying to flesh it out.

24 Let's just look at the map and let him ask his
25 question.

1 MS. AGRIMONTI: Could I have the exhibit
2 restated again, please.

3 MR. FUERNISS: I believe it's I-18.

4 MS. AGRIMONTI: Thank you.

5 A. I have the map in front of me. I'm sorry. What was
6 the question?

7 Q. Well, I'm just trying to establish what -- when
8 sPower came onto the project what lands were already
9 leased? And what was it and whereabouts those lands may
10 have been?

11 Does this map help us in any way there?

12 A. No. This map doesn't appear to indicate what lands
13 are leased.

14 Q. Can you tell me what this map does indicate?

15 A. It appears to show the outline of the project. And
16 it has some areas designated, and while on this print
17 it's orange, I'm going to assume it's red. And my
18 assumption is those would be landowners that definitely
19 do not want to participate in the project.

20 However, that is speculation on my part and is -- so
21 I'll leave it at that.

22 MR. FUERNISS: Thank you.

23 MR. DE HUECK: Ms. Jenkins, any
24 cross-examination based on Commissioner questions?

25 MS. JENKINS: I have no questions.

1 MR. DE HUECK: Ms. Pazour.

2 MS. PAZOUR: None at this moment.

3 MR. DE HUECK: And Staff.

4 MS. EDWARDS: Thank you.

5 RE CROSS-EXAMINATION

6 BY MS. EDWARDS:

7 Q. I believe it was Commissioner Nelson that asked
8 about the change in turbines, and you stated that that
9 change was to preserve a tax methodology?

10 A. That's correct. There's two tax methodologies. We
11 intend for the project to qualify under the one that
12 it -- that we've always planned on it. However, we
13 wanted to keep a second avenue open.

14 Q. Okay. And I'm aware of the two different tax
15 methodologies from the IRS standpoint.

16 Which are those -- which one are you relying on now,
17 and which one do you intend to preserve and how?

18 A. Sure. So relying on now is the construction of the
19 main power transformer for the project. And preserve
20 would be a 5 percent of capital cost on the project
21 having been spent prior to the end of 2016.

22 Q. And then turning to a discussion you had with
23 Commissioner Hanson regarding underground conduit, do you
24 recall that discussion?

25 A. I do.

1 Q. You had made some commitments in a data request, and
2 I'm feeling less confident about those commitments now.

3 Can you commit at this time to the Commission today
4 that if you -- if this project damages any field tile
5 when laying that underground conduit, you will repair and
6 replace the field tile?

7 A. Yes. That is our commitment to the landowners that
8 we have all the rights and we would make that commitment
9 to the Commission. However, if for whatever reason the
10 landowner insists that we do something slightly
11 different, I would not want to force us to do something
12 on their land.

13 But that is our commitment to the landowners, and
14 we're happy to make that Commitment to the Commission.

15 Q. You keep saying "landowner." So what if you damage
16 the tile which causes indirect damages on the neighboring
17 property's land? Say flooding. Is there a plan to
18 remediate that?

19 A. We would not -- we would not cause damage to another
20 landowner's land. That's something that we would
21 remediate and we would commit to the Commission to
22 remediate.

23 And I apologize. I was thinking of it specifically
24 in the context of landowners that we have leases. But,
25 of course, we remediate if we're causing issues on other

1 landowners' nonparticipating land.

2 MS. EDWARDS: Thank you.

3 No further questions.

4 MR. DE HUECK: Mr. Pawlowski, thank you for your
5 testimony. You may step down and, Prevailing Wind, you
6 may call your next witness.

7 (The witness is excused.)

8 (Discussion off the record.)

9 MR. DE HUECK: Prevailing Winds, go ahead and
10 call your next witness.

11 MS. AGRIMONTI: Prevailing Wind would call
12 Mike MaRous.

13 Michael MaRous,
14 called as a witness, being first duly sworn in the above
15 cause, testified under oath as follows:

16 MS. AGRIMONTI: My apologies. I had a different
17 order and I thought I was at the right page and I'm there
18 now.

19 DIRECT EXAMINATION

20 BY MS. AGRIMONTI:

21 Q. Mr. MaRous, could you please introduce yourself to
22 the Commission.

23 A. My name is Michael MaRous. I am a real estate
24 appraiser. I hold the MAI and the CRE designation --

25 MR. DE HUECK: Can I ask you to turn on your

1 mic. I can totally hear you, but we've got to have you
2 mic'd.

3 THE WITNESS: Sorry. There was a light on, but
4 it was red. Thank you.

5 Should I start over.

6 MR. DE HUECK: Sure.

7 A. My name is Michael MaRous. I'm president of
8 MaRous & Company. I am a real estate appraiser and have
9 been for over 40 years. I've held the MAI designation
10 for over 35 years and have sat on many national
11 committees.

12 Been president of the Chicago Chapter. I'm also on
13 the National Board of the Counselors of Real Estate. I'm
14 a licensed real estate appraiser, general certified, in
15 the State of South Dakota.

16 I have appraised over 15,000 properties, probably
17 \$15 billion worth of value and have done probably well
18 over 100 impact studies in my career.

19 I graduated from University of Illinois
20 Champaign-Urbana with a degree in finance and
21 specialization in urban land economics. And I have
22 testified before this Commission before.

23 Q. On what occasions did you testify before this
24 Commission?

25 A. The Crocker and the Dakota Range proposed wind farm

1 projects.

2 Q. In this matter did you file Prefiled Supplemental
3 Direct Testimony in August of this year?

4 A. I did.

5 Q. Is that Exhibit A15 and Exhibits A15-1 through 7?
6 Do you have those before you?

7 A. I have to move some books.

8 I do.

9 Q. And did you also file Rebuttal Testimony that was
10 revised and submitted yesterday as A16-R?

11 A. Yes.

12 Q. Can you please provide a brief summary of the topics
13 covered in your testimony?

14 A. Basically I reviewed the project submission. I
15 inspected the area and the footprint. I looked at
16 existing facilities in the project, did extensive
17 research into valuation, economics, value trends,
18 character of the area, and also southeast South Dakota.

19 Also interviewed many market participants, both
20 auctioneers, landowners, in the area. Did review and in
21 my report did analysis of peer-reviewed articles looking
22 at value impacts based on proposed -- or actual wind
23 farms. Also did extensive match pair analysis both in
24 South Dakota and some adjoining states.

25 As part of this, basically to get the feel of

1 on-the-ground activity, did research and conducted
2 surveys with the assessors in eight counties that have
3 over 25-unit wind farms to research to see if they had
4 gotten complaints, if they had had hearings and reviews
5 and had real estate tax reductions because of the
6 proximity of turbines.

7 Also did that -- some more survey in Minnesota,
8 Iowa, and Illinois, probably covering, you know, several
9 million acres of land, and there's been no granted tax
10 appeals in that. And, obviously, took into consideration
11 any of the issues, objector concerns, et cetera. But I
12 am not a doctor. But did review and rely on some of
13 these other expert studies.

14 And then in the Rebuttal, the Rebuttal just went to
15 the issues initially. The property value guarantees and
16 some of the issues with that consideration.

17 Q. And what was your ultimate conclusion with respect
18 to the project's potential impact on property values?

19 A. It was really a -- in my opinion, a relatively
20 straightforward conclusion that there would be no
21 negative impact on property values based on the proposed
22 project.

23 Q. Do you have any additions or corrections to your
24 prefiled testimony?

25 A. I don't believe so.

1 Q. If I asked you the same questions that are written
2 in your prefiled testimony, would your answers be the
3 same?

4 A. Yes.

5 MS. AGRIMONTI: Mr. MaRous is available for
6 cross-examination.

7 MR. ALMOND: No questions from Intervenors.

8 MR. DE HUECK: Mr. Fuerniss, do you have any
9 questions?

10 MR. FUERNISS: I have no questions.

11 MR. DE HUECK: Ms. Jenkins.

12 MS. JENKINS: No questions.

13 MR. DE HUECK: Ms. Pazour.

14 MS. PAZOUR: No questions.

15 MR. DE HUECK: And Staff.

16 MS. EDWARDS: No questions.

17 MR. DE HUECK: Commission questions.

18 Commissioner Nelson does have a question.

19 CHAIRWOMAN FIEGEN: Do you go first?

20 MR. DE HUECK: Well, I can start with Chairman
21 Fiegen. Do you have questions?

22 CHAIRWOMAN FIEGEN: I do.

23 MR. DE HUECK: Okay.

24 CHAIRWOMAN FIEGEN: So you talked about your
25 extensive research.

1 THE WITNESS: Yes.

2 CHAIRWOMAN FIEGEN: Do you believe that
3 extensive research on the impact of land values in
4 South Dakota in wind parks may take more time than is
5 given?

6 Although Mr. Lawrence doesn't sound like he is
7 going to testify, and I would ask him this question
8 because he stated it before, that it's going to take some
9 time to really do an extensive research on land values.

10 So you've indicated that you did an extensive
11 research. So are you confident in your explanation that
12 there is no adverse -- or does there need to really be
13 more research?

14 And I can't ask David because he's not going to
15 be here.

16 THE WITNESS: So the answer is, since you
17 brought up Mr. Lawrence, who I highly respect, he did
18 bring up comments in regard to my report and some
19 additional raw research that he had done.

20 Based on that, in light of just what you said,
21 it's an ongoing process, and we're trying to understand
22 everything that's going on and the impacts, that he had
23 basically 10 leads on potential transactions.

24 It turns out that there were two transactions,
25 both of large ag pieces. One was a 480-acre farm in

1 Jerauld that was just ag land and was about 3 miles east
2 of a wind farm, and there was another 330-acre parcel
3 that was actually on Avon and Jerauld in part of a wind
4 farm.

5 It was interesting. There's three turbines on
6 it. And the first property sold for \$3,300 an acre in
7 the end of 2017. The second property, which is pasture,
8 you know, which doesn't generate a lot of rent and
9 generally doesn't reflect a lot of value, sold for about
10 \$2,800. And I did go look at those properties and in --
11 going through further verification.

12 But the answer is I think what you heard
13 Dr. Roberts -- you know, it's ongoing investigation. And
14 that's really, Commissioner, one of the reasons that we
15 went to Iowa to look at where they've had a longer
16 history, low density, real productive ag, and how it's
17 impacted. And I think there were 28 assessors that I
18 talked to in 28 counties, and they were all incredibly
19 positive about the impact on value.

20 Now that ties in with hogs. It ties in with
21 corn. Soybeans. It was just, you know, an additional
22 piece of the puzzle.

23 So while there are people that have, you know,
24 negative feelings -- and, you know, again that kind of
25 goes to architectural and anything else. And I know

1 there are people that don't like them, but all
2 indications because of everything analyzed, considered,
3 the economic impacts, it's all positive as far as value.

4 But will things change? Can I predict the
5 future? Of course not. But I can tell you based on what
6 I've seen and the strong indications we have and the
7 positive economics of it -- and really in this one really
8 we were able to talk to quite a few different land
9 participants.

10 And it's basically based on, you know, proximity
11 to services, paved roads, proximity to employment
12 centers, such as Mitchell, such as, you know, Sioux Falls
13 that's -- and modern facilities that's driving the value.

14 CHAIRWOMAN FIEGEN: So you stated that you did
15 interviews. Were those face-to-face interviews in
16 Bon Homme, Charles Mix? Or are you talking about the
17 eight counties?

18 You talked about you did interviews. You talked
19 to market auctioneers. You talked to land appraisers.
20 Is that all in the Bon Homme area? The Charles Mix area?
21 I just didn't hear the qualifications of where those
22 people -- where they were found.

23 THE WITNESS: It's basically the answer is I
24 talked to them. I did not have face to face. I talked
25 to them on the phone, verified --

1 CHAIRWOMAN FIEGEN: From where?

2 THE WITNESS: I've got the list in the report,
3 but it kind of went down from Deuel all the way down
4 through Avon, basically not quite over to Sioux Falls,
5 west of Bon Homme.

6 And a lot of these auctioneers and brokers, they
7 handle large geographic areas, and they were stating the
8 same things. The interesting issue in the subject
9 footprint area because of the, you know, personal and
10 emotional controversy, there were a couple that gave me
11 opinions but did not -- you know, they wanted
12 confidentiality as part of their name because they have
13 relationships and business contacts and they did not want
14 to report and I held it out.

15 CHAIRWOMAN FIEGEN: How many days did you spend
16 face to face in the footprint?

17 THE WITNESS: I was -- well, I've been to the
18 footprint three times. I was there looking at it for
19 another project because I was interested, you know,
20 basically to see Beethoven, and while I was there I ended
21 up a little bit north. I didn't know that this project
22 was going forward, but I ended up in it.

23 And then I was there in May. You know, I drove
24 70 miles in the footprint. And then I was there
25 yesterday for a short time period.

1 CHAIRWOMAN FIEGEN: So do you know what the
2 building permits are for a quarter of land in those
3 counties?

4 So a farmer might have a quarter of land. Can
5 they have four building permits where they can sell off
6 acreages? Tell me how you evaluated the value of those
7 building permits.

8 THE WITNESS: That's a very good question
9 because it really ties in to basically the counties, and
10 it ties in to access. But the reality is it ties in to
11 market demand. And in the last few years and
12 particularly going back to about 2008 when there was the
13 real estate recession, there's been very little new
14 construction so there hasn't been demand. There hasn't
15 been evidences of the subdivision of these parcels.

16 What's happened more is in the family farm
17 where, you know, a child or a relative, you know, wants a
18 3- to 10-acre tract and then they subdivide it off. But
19 there's really no indication of that happening on an
20 active basis.

21 CHAIRWOMAN FIEGEN: Did you listen to -- or did
22 you read because I don't think you were at our public
23 hearing.

24 Did you read the public hearing that we had, the
25 public input hearing, or did you read any of the comments

1 about people coming back here and moving here, retiring
2 here? Did you read any of that or see any of that?

3 THE WITNESS: I actually read, but I didn't do
4 it word for word. I read it just to get the feel for it.
5 What was interesting about that in my -- you know, again,
6 I've seen it all throughout South Dakota is there are
7 people that are coming back for retirement, but what's
8 happening when there's some illness, a death, a divorce,
9 a lot of times -- and I think you heard earlier with the
10 lady saying, you know, that they were looking, you know,
11 possibly at moving because of, you know, the age
12 situation.

13 The other critical item that we look at with any
14 project, you know, is where are the best and the
15 brightest going? Are they staying, or are they not
16 coming back even to visit? And that was resounding with
17 the market participants where Avon has strong schools but
18 there still needs to be economic opportunity for
19 employment and that's really driving what you're going
20 at.

21 And, you know, the retirees, you know, there's a
22 longevity potential issue with that, unfortunately, and
23 I'm one of them. I look at the reality, and I hear from
24 my wife.

25 CHAIRWOMAN FIEGEN: We're going to go back to a

1 couple of questions I asked you about before, and I don't
2 know if you've answered those.

3 Building permits, the counties that this is
4 built in, Charles Mix, Bon Homme, and Hutchinson, what
5 are the building permits per quarter?

6 THE WITNESS: There's been virtually none.

7 CHAIRWOMAN FIEGEN: Okay. I'm sorry.

8 THE WITNESS: But from a legal standpoint --

9 CHAIRWOMAN FIEGEN: You know what, I'm asking
10 the wrong question. Maybe I don't know the definition of
11 it.

12 So if I owned a quarter of land, I a lot of
13 times have access to sell four acreages possibly in a
14 quarter of land. Tell me what that term is. If it's not
15 a building permit, what is that called?

16 THE WITNESS: Well, it's subdivision. It's a
17 building permit for a subdivision.

18 CHAIRWOMAN FIEGEN: Yeah. It's called -- like
19 in Minnehaha County, this is the county I'm aware of. If
20 I own a quarter of land in Minnehaha County, I have the
21 right to sell off four -- maybe four additional or
22 whatever.

23 MR. HUBNER: Housing eligibilities.

24 CHAIRWOMAN FIEGEN: Housing eligibilities. I am
25 so sorry. I have the wrong name. Building permits is

1 the wrong name. It's housing eligibilities.

2 So did you look at what Bon Homme, Charles Mix,
3 and Hutchinson, what the housing eligibilities for a
4 quarter of land are?

5 THE WITNESS: On a gross basis, I did not. But
6 to caution that, when you do that you have to provide
7 access. And the shape can impact. When you say a pure
8 quarter that's a little different but is it a buried
9 quarter or is it a corner and how would you do that
10 subdivision?

11 But the answer is, no, I did not.

12 CHAIRWOMAN FIEGEN: So in South Dakota I know
13 that in agriculture a lot of times farmers will sell off
14 one of their housing eligibilities. And they have access
15 to sell off a certain number according to the county.

16 The value of those housing eligibilities in a
17 wind park, did you investigate and in your research look
18 at the change in value of those housing eligibilities in
19 a wind park or a wind development?

20 THE WITNESS: The rough answer is generally I
21 did, but I didn't see any subdivision, recent subdivision
22 of any lots not only in the various footprints but
23 proximate to. So there was no market activity of that so
24 there was no data.

25 CHAIRWOMAN FIEGEN: Okay. I'm going to hold off

1 and see if I have anymore questions. Thank you.

2 THE WITNESS: You're welcome.

3 MR. DE HUECK: Commissioner Hanson, do you have
4 any questions?

5 COMMISSIONER HANSON: No. Getting to know your
6 way around South Dakota pretty well, aren't you?

7 THE WITNESS: I am.

8 COMMISSIONER HANSON: You update -- and
9 appraisals have a great value for a six-month period. So
10 no doubt you used some of the previous information on
11 this one or not?

12 THE WITNESS: I did.

13 COMMISSIONER HANSON: And I know it's probably
14 slim pickings -- I'm just thinking that it probably is --
15 for finding comparables for what you're looking for here.

16 Is that true, or were you able to find some good
17 comparables?

18 THE WITNESS: There were not good comparables.
19 It was slim pickings.

20 What's interesting, though, is the market is
21 relatively tight. Virtually nothing on the market.
22 There's demand, but the demand is closer to the towns on
23 paved roads with modern improvements that, you know, have
24 modern kitchens, that have modern layouts, that have
25 modern mechanicals. And so there's demand for that.

1 And maybe at some point there will be enough
2 where there's some of that division of some of these
3 agricultural pieces for some new housing.

4 COMMISSIONER HANSON: So you went -- instead of
5 a market value you used -- your appraisals were primarily
6 based upon income approach?

7 THE WITNESS: Well, I looked at the income, yes,
8 with the transactions but, again, went to the major
9 brokers, major auctioneers to see what was happening in
10 their market and how their potential buyers were
11 reacting, you know, particularly when they're looking at
12 properties, you know, proximate to Beethoven, as
13 example. And then, again, I went back to the Brookings
14 comparables, which were very good.

15 COMMISSIONER HANSON: Good. That would be
16 better than the income approach. Appreciate you doing
17 that. Thank you.

18 THE WITNESS: Yes.

19 CHAIRWOMAN FIEGEN: I have one more question.

20 MR. DE HUECK: Go ahead.

21 CHAIRWOMAN FIEGEN: Just wait one second.

22 So I think you talked about the best and the
23 brightest and, you know, trying to keep them in our home
24 state. You also, I think, heard possibly in testimony
25 maybe of Peter, I believe, that there is fiber here.

1 And I can't find my research that I'm looking
2 at, and I don't know if there's fiber to the premises
3 here or not. But that would mean that it would allow
4 people the opportunity possibly to work from home and
5 that there's been research done that possibly 22 percent
6 of Americans are now working from home full time or at
7 least part of their job is working from home.

8 So the best and the brightest certainly -- I
9 mean, economic development and living back home certainly
10 could happen if there's fiber to the home.

11 THE WITNESS: Absolutely. But it's not only
12 fiber. It's shopping. It's hospitals. It's medical
13 support. It's entertainment uses. It's restaurants.
14 It's diversity.

15 I mean, that's why, you know, Des Moines, as
16 an example, West Des Moines, why there's been -- you
17 know, the 18-hour city. And, you know, there's the --
18 the pull and tug and in South Dakota you've got very nice
19 open spaces. You've got great hunting. You've got great
20 services. You've got a lot going on. But you're not
21 going to appeal to everybody. And the fiber does help,
22 but it doesn't solve all the problems.

23 CHAIRWOMAN FIEGEN: Okay. Thank you.

24 MR. DE HUECK: Redirect.

25 MS. AGRIMONTI: I have no redirect.

1 MR. DE HUECK: Cross-examination based on
2 Commissioner Fiegen's questioning?

3 MR. ALMOND: Nothing.

4 MR. FUERNISS: I'm going to let my curiosity get
5 the better of me here.

6 CROSS-EXAMINATION

7 BY MR. FUERNISS:

8 Q. You answered the question of Commissioner Fiegen's
9 about how you had looked at land value and so forth, and
10 I think you said from Deuel, meaning Deuel County, down
11 to Avon.

12 Is that how I understood that?

13 A. Going north to south. And really south of Avon too.
14 Probably 15 miles south of Avon.

15 Q. My curiosity here is you realize that that area of
16 the state is part of what's called the Prairie Coteau?

17 A. I do.

18 Q. Okay. And the western part of this project that's
19 in Charles Mix County is on the Missouri Coteau.

20 A. I do know that.

21 Q. Okay. Would you say that then looking from Deuel
22 County south into Bon Homme County that would be
23 comparable to the west of that as well?

24 A. Well, there's comparability, just based on the ag
25 and the grazing type character. A lot of the Deuel is

1 very rough, has a lot of sloping terrain.

2 You know, it's proximate to Brookings, but, again,
3 you know, here you've kind of got Mitchell. You've got
4 Sioux Falls. I mean, there's similar characteristics,
5 but they're obviously not identical. But investors --
6 there's similar characteristics for investors, and then
7 it goes down to land rent and price.

8 Q. Okay. Because we often in Charles Mix County have
9 the feeling like we're the -- more like West River
10 South Dakota actually than East River because we are on
11 that Missouri Coteau, and I was just wondering, you know,
12 if that comparison was valid.

13 A. I think it is.

14 Q. Okay. Thank you.

15 A. Yes.

16 MR. DE HUECK: Ms. Jenkins.

17 CROSS-EXAMINATION

18 BY MS. JENKINS:

19 Q. I just would like to ask in real estate they talk
20 about location, location, location. How would you define
21 that?

22 Or what I should say is what would make -- you're
23 telling us that everybody wants to live near the city,
24 but what about the people that want to live away from the
25 traffic, away from a lot of people and that?

1 Wouldn't property in the country be considered that
2 way for a lot of people?

3 A. Well, that's multiple questions, but the answer is
4 yes. There is a certain part of the market that wants a
5 more open, more rural type community, but they still need
6 services.

7 They still need medical. They still like -- most of
8 them like paved roads. And unless they're independently
9 wealthy, they still need to work. So it becomes to
10 practical.

11 And then the other issue, if they're married, they
12 both have to have similar interests, or one's going to
13 win out.

14 MS. JENKINS: Thank you.

15 MR. DE HUECK: Ms. Pazour.

16 MS. PAZOUR: Nothing.

17 MR. DE HUECK: Thank you.

18 Staff.

19 MS. EDWARDS: Thank you.

20 CROSS-EXAMINATION

21 BY MS. EDWARDS:

22 Q. You testified that you went to a few projects in
23 Iowa, did you say, in response to Commissioner Fiegen's
24 question?

25 A. I looked at the history of Iowa, and I've been

1 involved with a couple of projects in Iowa and have done
2 research on the Iowa and have talked to the 18 assessors.
3 Yes.

4 Q. Do you know, were any of those projects of the same
5 height -- the towers of the same height these are?

6 A. They're coming. I don't know if any have been
7 built. They've been built on the East Coast and in
8 Michigan. There's a couple planned in Illinois, and
9 there's a couple Ida County, they're planned there, but
10 I'm not aware of any that are up.

11 MS. EDWARDS: No further questions.

12 MR. DE HUECK: With that, thank you for your
13 testimony, and you may step down.

14 THE WITNESS: Thank you.

15 (The witness is excused.)

16 MR. DE HUECK: We will take a break. I have
17 6 o'clock here so let's come back at, say, 6:15.

18 (A short recess is taken.)

19 MR. DE HUECK: We'll call the meeting back to
20 order. Prevailing Winds, you are free to call your next
21 witness.

22 MS. SMITH: Thank you. We will call
23 Daniel Pardo.

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DIRECT EXAMINATION

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BY MS. SMITH:

Q. Mr. Pardo, can you introduce yourself for the Commission. And you'll need to push the green button so your light turns on.

A. Yes. Thank you. My name is Daniel Pardo. I work for DNV GL, the consulting company that was engaged by the Prevailing Wind Park Project to provide the decommissioning assessment.

I have a bachelor's degree in mechanical engineering and a master's degree in wind energy and 14 years of practical experience in wind energy.

Q. And did you file Supplemental Direct Testimony in this matter on August 10, 2018?

A. Yes.

Q. And is that testimony found in Exhibits A11 and A11-1 through A11-2?

A. Correct.

Q. And can you provide a brief summary of the topics that are covered in your testimony?

A. Sure. So the testimony addresses the estimate that we have done for what the decommissioning costs for this specific project will be upon the conditions of today's market and the information provided by Prevailing Wind Park.

1 Q. And are you aware that the proposed hub height of
2 the turbine model has increased by 1.5 meters since you
3 conducted your analysis?

4 A. Yes. I'm aware.

5 Q. And does that change affect your decommissioning
6 cost estimate for the project?

7 A. It does at a small scale. It will affect on the
8 resale value or, sorry, the scrap value of the
9 components. Because there will be more steel for resale
10 apart from --

11 But, again, I think it's a minor percentage. And
12 apart from that, it wouldn't have any other impact.

13 Q. So if I'm understanding correctly, if it did have an
14 impact, it would be to decrease the cost when you're
15 taking into account salvage value?

16 A. That's correct.

17 Q. But, otherwise, it would not affect your analysis?

18 A. That's correct.

19 Q. And do you have any additions or corrections to
20 anything besides what we've just talked about?

21 A. No, I don't.

22 Q. And are the assumptions that are included in your
23 cost estimate for this project, are they conservative
24 estimates?

25 A. Yeah. We have made some conservative assumptions,

1 and these are explained in the document.

2 Q. And can you give some examples of those conservative
3 assumptions for your analysis?

4 A. Sure. One of them is that all project roads will be
5 decommissioned. In reality and what we think might
6 happen --

7 Yeah. I guess I should say what we think might
8 happen is that some of the roads or the landowners will
9 request those roads to be left for their own use.
10 However, this study assumes all roads will be
11 decommissioned.

12 Another conservative assumption is that all
13 collection system cabling will be removed. From the
14 information we received from Prevailing Wind Park this
15 collection system will be buried below the 4 feet
16 required grade, and they might decide to leave it in
17 place in the future.

18 But, again, the study assumes the cost for removing
19 it will be there and the project bear it. We also make
20 some conservative assumptions on the resale scenario.
21 For instance, that on the -- a percentage of the major
22 components which have been replaced in the last five
23 years in the turbines will be for sale on a secondhand
24 market.

25 We also assume that medium grade components like

1 small motors and older power electronics will not be for
2 sale -- or for resale, which is, again, something that we
3 consider can or could happen in 30 years down the road,
4 but we have decided not to include those potential
5 revenues for the project.

6 Q. And as far as the accuracy of your analysis, can you
7 explain -- I know it's addressed in your testimony, but
8 can you explain the reasons that you feel your cost
9 estimate is accurate?

10 A. Yes. So DNV GL for the decommissioning assessment
11 we're discussing here has made the assumption that the
12 decommissioning process resembles significantly the
13 construction process in a reverse order. And taking that
14 into account and the fact that DNV GL participates as an
15 independent engineer in approximately 75 percent of the
16 financing operations for wind farms in the United States,
17 that gives us a good understanding of the construction
18 process.

19 And we are confident on the method we have used. So
20 we think that the numbers on the estimates we've given
21 here are the best and most accurate representation we
22 can give of the decommissioning of this particular wind
23 farm.

24 Q. All right. And if I asked you the questions in your
25 testimony, would you have the same answers that were

1 given in writing?

2 A. Yes.

3 MS. SMITH: I have no further questions and
4 offer Mr. Pardo for cross-examination.

5 MR. ALMOND: No questions.

6 MR. DE HUECK: Mr. Fuerniss.

7 MR. FUERNISS: Just one question.

8 CROSS-EXAMINATION

9 BY MR. FUERNISS:

10 Q. If someone was to say the decommissioning cost might
11 be more on the order of \$350,000 per turbine, how would
12 they have possibly come up with a number like that?

13 A. I would have to say there would be -- there will
14 need to be a discussion on what the assumptions on that
15 calculation would be to be able to answer it.

16 Q. Well, I mean, that's an extreme difference, wouldn't
17 you say, from what you're estimating some \$50,000? Is
18 that the number that I saw?

19 A. I agree it's a big difference.

20 Q. Yeah. Well, I'm just wondering how someone else
21 could have possibly come up with such a huge number or
22 they possibly weren't taking into account the resale
23 value of anything possibly or scrap metal or anything
24 like that?

25 A. I guess there can be many possibilities, but I

1 wouldn't be able to speak to a study which we haven't
2 reviewed or authored.

3 MR. FUERNISS: Thank you.

4 MR. DE HUECK: Ms. Jenkins.

5 MS. JENKINS: No questions.

6 MR. DE HUECK: Ms. Pazour.

7 MS. PAZOUR: No questions.

8 MR. DE HUECK: Staff.

9 MS. EDWARDS: No questions.

10 MR. DE HUECK: Commission questions.

11 Commissioner Hanson.

12 COMMISSIONER HANSON: Good evening.

13 Would you say your analysis incorporated very
14 much the same work that you did on the decommissioning
15 cost analysis for Dakota Range Wind Project?

16 THE WITNESS: Yes. So the methodology is the
17 same one. And what we've changed is the project-specific
18 variables, and, as you can probably tell, some of the
19 values for the scrap material. But apart from that, it's
20 very similar.

21 COMMISSIONER HANSON: Okay. Correct. That's
22 why I was wondering where you came up with the slight
23 differences.

24 I appreciate that. Thank you.

25 THE WITNESS: You're welcome.

1 COMMISSIONER HANSON: No further questions.

2 MR. DE HUECK: Commissioner Fiegen.

3 CHAIRWOMAN FIEGEN: Do you know the cost it
4 would be if you decommissioned the entire foundation?

5 THE WITNESS: I don't know that. It can be
6 calculated, though.

7 CHAIRWOMAN FIEGEN: Okay. And does your
8 decommissioning plan, does that go down 4 feet?

9 THE WITNESS: Correct.

10 CHAIRWOMAN FIEGEN: Okay. So are there any
11 studies that the 4 feet won't affect cropland or drainage
12 in the future for agriculture if it's decommissioned to
13 only 4 feet?

14 THE WITNESS: The study that we were engaged to
15 do did not cover that subject.

16 CHAIRWOMAN FIEGEN: The last question I have is
17 on page 3 it talks about these are 2018 dollars. So the
18 \$51,000 is 2018 dollars and not calculated --

19 THE WITNESS: That's correct. 2018 dollars.

20 CHAIRWOMAN FIEGEN: But it appears that Staff
21 and you have an agreement that you'll look at that year
22 10, and there will be a report every year after that to
23 look -- oh, you probably don't make that agreement. It's
24 probably Prevailing Wind.

25 So are you aware of an agreement that has been

1 made between Staff and Prevailing Wind on
2 decommissioning?

3 THE WITNESS: I'm aware there has been an
4 agreement. I know that -- I've been informed about the
5 general terms of it. I don't know the specifics.

6 CHAIRWOMAN FIEGEN: Okay. Thank you.

7 THE WITNESS: You're welcome.

8 MR. DE HUECK: Redirect.

9 MS. SMITH: I don't have any.

10 MR. DE HUECK: Cross-examination based on
11 Commission questions.

12 Mr. Almond.

13 MR. ALMOND: None based off Commission
14 questions.

15 MR. DE HUECK: Mr. Fuerniss.

16 RE-CROSS-EXAMINATION

17 BY MR. FUERNISS:

18 Q. This is probably beyond the scope of your expertise
19 as well, but Commissioner Fiegen brought up the 4 feet
20 off the top of the foundation and, as I understand it,
21 these foundations are probably 65 feet in diameter.

22 As a farmer I find it difficult to imagine growing a
23 profitable crop above a 65-foot circle of concrete on
24 only 4 feet of soil. Can you address that in any way,
25 leaving that huge amount of concrete there?

1 A. I'm sorry. That was not included within the scope
2 of the assessment that we prepared here.

3 MR. FUERNISS: Thank you.

4 MR. DE HUECK: Ms. Jenkins.

5 MS. JENKINS: No questions.

6 MR. DE HUECK: Ms. Pazour.

7 MS. PAZOUR: No questions.

8 MR. DE HUECK: And Staff.

9 MS. REISS: No. And thank you for remembering
10 us.

11 MR. DE HUECK: With that, your testimony is
12 concluded. Thank you very much.

13 THE WITNESS: Thank you so much.

14 (The witness is excused.)

15 MR. DE HUECK: Prevailing Winds, you may call
16 your next witness.

17 MS. AGRIMONTI: The witness I intended to call
18 next was Dr. Ellenbogen. His setup will probably take a
19 little bit longer than others, and I understand there's
20 quite a bit of cross-examination anticipated by
21 Mr. Almond.

22 I don't know if this is a good time to end for
23 the day or if you'd like us to get him partially up on
24 the stand and see how far we can go.

25 MR. DE HUECK: I think we should begin and get

1 him at least sworn in and get your direct examination out
2 of the way.

3 MS. AGRIMONTI: All right then. We would call
4 Jeff Ellenbogen, that's Dr. Jeff Ellenbogen, a
5 neurologist.

6 DR. JEFF ELLENBOGEN,
7 called as a witness, being first duly sworn in the above
8 cause, testified under oath as follows:

9 DIRECT EXAMINATION

10 BY MS. AGRIMONTI:

11 Q. Dr. Ellenbogen, please introduce yourself to the
12 Commissioners.

13 A. Good evening. My name is Jeff Ellenbogen. I'm a
14 practicing physician in the state of Maryland,
15 board-certified neurologist and a board-certified sleep
16 specialist.

17 Q. Please provide an overview of your education and
18 your work history.

19 A. Sure. Education first. I went to college here in
20 the Midwest, the University of Michigan, and then to
21 medical school in Boston where I grew up at Tufts Medical
22 School. Then I did an internship residency in neurology
23 and a fellowship in clinical electrophysiology, all of
24 that at the University of Pennsylvania in Philadelphia.
25 Then I did a postdoctoral fellowship and a master's

1 degree in medical science both at Harvard Medical School.

2 Oh, and my work -- sorry. It was a two-part
3 question. Since then I was a neurologist at Mass.
4 General Hospital in Boston and assistant professor of
5 neurology there. I was the Director of Sleep Medicine,
6 their division, for about six years, and then I moved to
7 Johns Hopkins where I was similarly a neurologist and
8 sleep medicine system professor running a research lab
9 looking at the interface of sound and sleep. And I am
10 currently the director of the Sound Sleep Project.

11 Q. And what is the Sound Sleep Project?

12 A. The Sound Sleep Project is an effort to take
13 academic information, match it with industry in order to
14 foster and promote health, wellness, and medical
15 well-being of people with sleep-related disorders.

16 Q. Did you file Prefiled Direct Testimony in this case?

17 A. Prefiled Direct Testimony I did not.

18 Q. And did you file Rebuttal Testimony in September of
19 this year?

20 A. Yes.

21 Q. And do you have that before you as A18 and A18-1?

22 A. Pardon me a moment.

23 Yes.

24 Q. And then also could you please turn to A4-7 in that
25 same binder.

1 A. I don't think it's in this one. It must be in
2 another.

3 A4-7.

4 Q. Yes. Are you there?

5 A. Yes.

6 Q. I note on page 2 it identifies expert independent
7 panel members, and the first name there is Jeffrey
8 Ellenbogen M.D. Is that you?

9 A. Yes.

10 Q. Please provide a brief summary of the topics covered
11 in your testimony.

12 A. I was asked to cover a couple of different topics,
13 the first being my general impression of the project
14 itself with respect to health. I was asked to provide
15 testimony regarding my involvement for the panel in
16 Massachusetts that developed this Massachusetts study
17 that's been referred to today.

18 And I've also been asked to testify regarding
19 independent medical evaluations that I conducted in the
20 state of Michigan some years ago regarding people who had
21 registered complaints regarding their health from wind
22 turbines that they were living in proximity to.

23 Q. One of the things in your testimony you talked about
24 was the potential for misattribution of causes of
25 illnesses.

1 Can you tell me more about what you found in your
2 independent medical examinations with respect to that?

3 A. Yes. I'd be glad to, and I think this is a very
4 important topic.

5 First of all, what I did, and then some editorial
6 regarding it. I went to the state of Michigan. I was
7 asked to go there to evaluate four people who raised
8 concerns regarding their health and its causality or
9 presumed causality from turbines that they were living
10 near.

11 And so I was able to conduct a thorough history,
12 physical examination, and review of their medical
13 records. And I'll share an example, if I may, because I
14 think it's instructive. We could go over all of them,
15 but I think this is a good exemplary case.

16 It was a 60 year old farmer who raised concern that
17 the wind turbines that he was living near were causing
18 him to have imbalance. And to make a very long story
19 short, it was clear from the history and more importantly
20 from my neurological examination that he had a fairly
21 serious neuropathy, a disorder in which he was unable to
22 conduct sensory information from his legs to his brain.
23 Really common problem.

24 It was undoubtedly due to his very heavy alcohol use
25 and to his almost certain diabetes. Blood sugar is

1 fairly toxic to the nerves.

2 And here's where the misattribution comes in. I
3 felt that here was this very sincere man who had a very
4 genuine problem, and he had spent the better part of a
5 year or more through channels of litigation and focusing
6 entirely on wind turbines and why he was losing his
7 balance as a result of them. I felt he lost a lot of
8 time in diagnosing and treating and -- or at least
9 stopping the inciting event that was causing his
10 neuropathy.

11 I felt like it was a major disservice to him and his
12 health that he had read about the serious nature of wind
13 turbines causing severe health problems and he attributed
14 one of them which he had read about from imbalance to his
15 medical problem.

16 Q. Would your prefiled testimony be the same if I asked
17 you the same questions here today?

18 A. Yes.

19 Q. All right. I'd also like to ask you some questions
20 about Mr. Fuerniss who has provided some testimony in
21 this case.

22 Are you aware of Mr. Fuerniss's claim that he
23 suffers from vertigo?

24 A. Yes.

25 Q. And do you have training in diagnosing individuals

1 with vertigo?

2 A. Yes.

3 Q. What kind of experience do you have?

4 A. I'm a neurologist, and a major part of our training
5 has to do with the vestibular cochlear nerve that's
6 interfaced with the brain, cerebellum, so forth, and that
7 is the mechanism for which balance is considered to be a
8 problem.

9 With respect to the neurologic, there are lots of
10 causes, and maybe we'll have time to go over them. But I
11 have years of training that includes focusing on the
12 neurologic elements of vertigo and distinguishing them
13 from nonneurologic causes.

14 Q. And if you were looking for authoritative medical
15 references to use to identify symptoms of vertigo or
16 other diseases, where would you look?

17 A. Oh, there are lots of places, both online and text.
18 UpToDate is a terrific kind of general reference. Adams
19 and Victor is a terrific neurological text that has a
20 traditional -- a really thoughtful approach to vertigo.
21 Lots of choices.

22 Q. What are the symptoms of vertigo?

23 A. I believe the first step is deciding whether a
24 person has vertigo at all. And, you know, at the risk of
25 time -- I tend to be long winded so I will try not to be.

1 But the very first step is when someone says I have
2 vertigo, you know, really trying to understand what do
3 they have? Because a lot of people use that term, but
4 they actually mean lightheadedness, which is a much more
5 common problem. So that is a big branch in sort of the
6 diagnostic clinical tree is deciding whether a person has
7 lightheadedness, which could be cardiovascular, it could
8 be electrolyte imbalances, and so forth, versus true
9 vertigo, which is a misperception of motion, which has a
10 whole list of considerations by itself.

11 Q. Can you name a few cause of vertigo?

12 A. Sure.

13 (Discussion off the record.)

14 A. I'm answering the question about some of the
15 neurological cause of vertigo. Just to give some
16 examples briefly, and we can go into more detail if you'd
17 like. Vascular causes, including stroke. Infectious
18 causes, including labyrinthitis, an inflammatory problem
19 of the inner ear. Tumors of the peripheral eighth nerve,
20 cerebellum. This must be --

21 THE WITNESS: You're incredible if you're typing
22 that. You're a medical version of --

23 A. Connect tumors. Trauma is another one. Toxins,
24 very common. Most notably alcohol, but others. Alcohol
25 can also not be a toxin, but it can be toxic.

1 Medications.

2 Electrolyte imbalances like sodium glucose,
3 especially with diabetes. And a host of neurological
4 problems, benign positional vertigo, which is very
5 common, migraine headaches, multiple sclerosis. I could
6 go on, but those are the big ones.

7 Q. I didn't hear you identify wind turbines as a
8 potential cause. Do you have an opinion as to whether
9 wind turbines are a potential cause of vertigo?

10 A. I have no reason to believe that wind turbines would
11 cause vertigo.

12 Q. Can you review the medical records identified as
13 Fuerniss Exhibits 1 and 2? Those should also be
14 available to you.

15 A. I don't know where they would be available, but I do
16 recall reviewing them.

17 Q. I'll get you copies.

18 A. In front of me I have Exhibit IF-1. Does that make
19 sense?

20 Q. And IF-2?

21 A. IF-2.

22 Q. What did you learn from reviewing these two
23 documents?

24 A. I learned some things. It's incredibly sparse
25 information, but I could glean something from it.

1 First of all, I just start from the top coming down.
2 It's really only vital signs and a new prescription. And
3 then a follow up afterward that includes a change of the
4 medication. That's all the information that's available.
5 It's not a history. It's not an examination. There are
6 no tests whatsoever. So I couldn't render an opinion
7 based on this. It's just way too sparse.

8 But I noticed a few things. The person -- I
9 apologize with respect to his privacy, you know, sort of
10 filleting his personal life here, but he was -- he's
11 obese, has otherwise normal vital signs.

12 And when he was asked to take -- or was prescribed a
13 new medication, Meclozine, which is a drug that's
14 sometimes used for motion sickness -- that's its
15 principal use actually. It's a fairly healthy dose,
16 good-sized dose, and it was prescribed for one month.

17 And he was also continuing his aspirin, which I
18 could think of a lot of reasons -- I forgot to mention on
19 my list of possible causes of vertigo is migraine
20 headaches, and he could have chronic headache problems.
21 Preventing stroke. Aspirin, a baby aspirin, as he's on,
22 certainly vascular risk factors like obesity. So lots of
23 reasons that he could have vertigo just from the sparse
24 information.

25 And then the only other thing is the history.

1 Vertigo, nausea, and neck pain. So neck pain made me
2 worried. Maybe he had a recent trauma that could cause
3 vertigo as well.

4 Q. Thank you.

5 Mr. Fuerniss has represented that he believes that
6 the infrasound and low frequency noise from existing
7 turbines may contribute to these issues, as per Navy
8 nauseautic [phonetic] studies.

9 What is your response to that?

10 A. I have no basis or reason to believe that wind
11 turbines would cause vertigo at all. I would appreciate
12 the opportunity to evaluate him thoroughly and know what
13 he has had done because I worry that he is joining a long
14 list of people who have focused their health and
15 well-being on wind turbine causation, unsubstantiated
16 claims, and as a consequence have done, you know,
17 unnecessary harm to their own health by at the very least
18 causing delay of proper diagnosis and treatment of the
19 real underlying problem.

20 Q. Okay. Lastly, Dr. Ellenbogen, Dr. Punch asserts
21 that wind turbine noise is a significant disruptor of
22 sleep. And we've had a number of questions, and I know
23 that you were here today, about sleep disruption.

24 Do you agree with that statement?

25 A. I do not. I have looked at the literature both in

1 my participation for the Massachusetts study and in the
2 more recent literature, including a very large study from
3 Canada that is the only objective study of sleep in
4 existence regarding its interface with wind turbines that
5 showed no effect of sleep from wind turbines, either
6 objectively or subjectively.

7 Could they, if they got very loud, cause some sleep
8 disruption? Sure. But at the levels that we're talking
9 about here, I see no basis for that at all.

10 Q. Did the Health Canada Study evaluate any particular
11 dBA level?

12 A. They went up to 46 dBA.

13 MS. AGRIMONTI: Thank you. I have no further
14 questions, and Dr. Ellenbogen is available for cross.

15 MR. DE HUECK: With that, I think we'll -- yep.
16 I think this is a natural break for us, and we're going
17 to go ahead and recess until tomorrow.

18 MR. ALMOND: Before we recess, I have a
19 procedural issue I'd like to discuss. It's the issue of
20 the owner manuals Ms. Agrimonti was talking about
21 earlier, the GE owner manuals.

22 I would like to see those. I think if the
23 Commission were to do an order finding them confidential
24 for attorneys eyes only, I'd be able to look at them. Is
25 that fair?

1 MS. AGRIMONTI: Yeah. Mr. Almond, that was the
2 circumstances under which GE said we could disclose them.
3 So we would need a protective order that included an
4 attorneys eyes only provision.

5 MR. DE HUECK: If you would like to, just like
6 we did last time, prepare that, I'll sign it.

7 MS. AGRIMONTI: Yep. We can do that.

8 MR. ALMOND: I think the Commission can probably
9 make an oral order right now.

10 MS. AGRIMONTI: That would be fine as well. So
11 the request would be that -- and I have two documents
12 that I would submit, a safety manual and operating
13 manual, would be treated as confidential in the PUC's
14 docket, considered trade secret.

15 It would be disclosed to Mr. Almond for his
16 review only and not for that of his clients.

17 MR. DE HUECK: Do we need a vote on this? I
18 would --

19 COMMISSIONER HANSON: Your ruling.

20 MR. DE HUECK: I'm going to rule, yes, please
21 submit that. Let Mr. Almond view it. And we will keep
22 it confidential for lawyer eyes only.

23 MS. AGRIMONTI: All right. I will submit it on
24 that basis.

25 MR. DE HUECK: Thank you.

1 So, with that, we will recess until tomorrow
2 morning.

3 (Discussion off the record.)

4 MR. DE HUECK: We'll recess for tonight. We'll
5 reconvene at 8:30 tomorrow morning, and Mr. Ellenbogen
6 will take the stand and be subject to cross-examination.

7 See everyone tomorrow at 8:30.

8 (The hearing is in recess at 6:45 p.m.)

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STATE OF SOUTH DAKOTA)

COUNTY OF SULLY)

:SS CERTIFICATE

I, CHERI MCCOMSEY WITTLER, a Registered Professional Reporter, Certified Realtime Reporter and Notary Public in and for the State of South Dakota:

DO HEREBY CERTIFY that as the duly-appointed shorthand reporter, I took in shorthand the proceedings had in the above-entitled matter on the 9th day of October, 2018, and that the attached is a true and correct transcription of the proceedings so taken.

Dated at Onida, South Dakota this 31st day of October, 2018.

/s/ Cheri McComsey Wittler
Cheri McComsey Wittler,
Notary Public and
Registered Professional Reporter
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