

BEFORE THE OHIO POWER SITING BOARD

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In the Matter of the :
Application of Buckeye :
Wind, LLC for a :
Certificate to Install :
Numerous Electricity :
Generating Wind Turbines : Case No. 08-666-EL-BGN
in Champaign County to be :
Collected at an Electric :
Substation in Union :
Township, Champaign :
County. :

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PROCEEDINGS

before Ms. Greta See and Ms. Katie Stenman,
Administrative Law Judges, at the Public Utilities
Commission of Ohio, 180 East Broad Street, Room 11-A,
Columbus, Ohio, called at 9:00 a.m. on Thursday,
November 12, 2009.

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VOLUME III

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1 Thursday Morning Session,
2 November 12, 2009.

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4 ALJ STENMAN: Let's go another round of
5 appearances starting with the company.

6 MR. PETRICOFF: Thank you, your Honor.
7 On behalf of the applicant Buckeye Wind, M. Howard
8 Petricoff, Michael Settinar, and Steve Howard. And
9 I'd also like to add an additional appearance of Gina
10 Rosa, and she will probably take Mr. Howard's place
11 in terms of cross-examination.

12 ALJ STENMAN: Want to go around the
13 table?

14 MR. MARGARD: On behalf of the Board
15 staff, Werner Margard and John Jones, Public
16 Utilities Section, Margaret Malone and Christina
17 Grasseschi of the Environmental Protection Section.

18 MR. VAN KLEY: Jack Van Kley and Chris
19 Walker from Van Kley & Walker. We represent Union
20 Neighbors United, the McConnells, and Julie Johnson.

21 MS. FLAIVE: On behalf of Champaign
22 Telephone Company, Carolyn Flahive, Thompson Hine,
23 LLP, 41 South High Street, Columbus, Ohio.

24 MR. BROWN: Daniel A. Brown, Brown Law
25 Office, representing the Urbana Country Club.

1 MS. NAPIER: On behalf of Champaign
2 County and Goshen, Rush, Salem, Union, Urbana, and
3 Wayne Townships, I am Jane Napier, Assistant
4 Prosecuting Attorney, along with Nick Selvaggio,
5 Champaign County Prosecuting Attorney.

6 ALJ STENMAN: We have some motions
7 pending before us at this time. With respect to the
8 motion regarding the testimony of Mr. Skillman, we'll
9 hold onto that until Mr. Weithman is present.

10 With regard to the motion concerning the
11 testimony filed at the public hearing, we're going to
12 table that as well until we're sure what's going to
13 happen with Dr. Nissenbaum.

14 That leaves us with the motion to exclude
15 the testimony of Mr. Wunsch and Ms. Taylor, and at
16 this time the Bench will deny that motion. All those
17 are not experts. We believe that the best course for
18 dealing with that testimony is for the Board to give
19 it appropriate weight.

20 The same will be true of the testimony or
21 the motion to include the testimony of Mr. Bauer,
22 that will be denied also. We're going to allow all
23 of that testimony.

24 And with that I believe that Buckeye can
25 call their next witness.

1 MR. PETRICOFF: Thank you, your Honor.
2 Before we do that, your Honor, I would like to ask
3 your indulgence in terms of dealing with the maps.
4 When we have the maps that go with the application --
5 let me start back.

6 The application, when you follow the
7 rules you file four copies with big maps and 20
8 copies with small maps. The set that we brought for
9 the Bench were the big maps.

10 What happened when the cross-examination
11 came of Mr. Shears is everybody immediately
12 gravitated to the big maps, which of course are the
13 Bench's maps.

14 I think the same is going to be true for
15 Ms. Meinke when we call her, and I have talked with
16 counsel on the other side.

17 And with that, with the Bench's
18 indulgence we may want to use the big maps for her to
19 look at and if so, I have small maps for the Bench,
20 at the end of which the Bench is welcome to keep both
21 the large and the small.

22 ALJ STENMAN: That's excellent. And we
23 also have an easel that we brought in this morning if
24 that helps with the large maps, although it's a
25 little antiquated.

1 MR. PETRICOFF: I'm not a structural
2 engineer, but just eyeing it I don't think that's
3 going to work.

4 ALJ SEE: The State works with what it
5 has.

6 MR. PETRICOFF: Your Honor, with --

7 ALJ SEE: Mr. Petricoff, before you move
8 on to Ms. Meinke, I had asked Union Neighbors United
9 and the company to look at UNU Exhibit 45. Have you
10 had an opportunity to do that?

11 MR. SETTINERI: Your Honor, yes. We did
12 produce the entire article. I have looked at what
13 was identified as UNU Exhibit 45 and at this time
14 we'll withdraw our objection to that.

15 ALJ SEE: Given that there are no
16 objections to the admission of UNU Exhibit 45. It
17 will be admitted into the record.

18 (Exhibit admitted.)

19 ALJ STENMAN: You may call your next
20 witness.

21 MR. PETRICOFF: Thank you, your Honor.
22 Before that I would like to have marked as Buckeye
23 Exhibit No. 7 the direct prepared testimony of Cara
24 Meinke.

25 ALJ STENMAN: So marked.

1 (Exhibit marked.)

2 MR. PETRICOFF: And with that I'd like to
3 call Ms. Meinke to the stand.

4 ALJ STENMAN: Please raise your right
5 hand.

6 (Witness sworn.)

7 ALJ STENMAN: Go ahead.

8 MR. PETRICOFF: Thank you, your Honor.

9 - - -

10 CARA W. MEINKE

11 being first duly sworn, as prescribed by law, was
12 examined and testified as follows:

13 DIRECT EXAMINATION

14 BY MR. PETRICOFF:

15 Q. Morning, Ms. Meinke. Could you state
16 your name and business address for the record?

17 A. My name is Cara Meinke, and my business
18 address is 25864-F Business Center Drive, Redlands,
19 California.

20 Q. I have shown you what has now been marked
21 as the applicant's, Buckeye Wind's Exhibit No. 7 and
22 ask if you can identify that document.

23 A. This is my testimony.

24 Q. And if I were to ask you the same
25 questions today that are in this document would your

1 answers be the same?

2 A. Yes.

3 Q. Are there any amendments or updates you
4 would like to make to that testimony?

5 A. No.

6 MR. PETRICOFF: Your Honor, the witness
7 is available for cross-examination.

8 ALJ STENMAN: Union Neighbors United?

9 MR. VAN KLEY: Thank you, your Honor.

10 - - -

11 CROSS-EXAMINATION

12 BY MR. VAN KLEY:

13 Q. Good morning, Ms. Meinke.

14 A. Good morning.

15 Q. I want to ask you about the birds and the
16 bats this morning. I understand those are both your
17 areas of expertise in this; is that correct?

18 A. That's correct.

19 Q. Why don't we start with the birds. I
20 understand that you did some surveys of birds in the
21 area of the project area?

22 A. That's correct.

23 Q. All right. And the purpose of your
24 surveys was to determine what species of birds lived
25 in the area as well as those that migrated through

1 the area?

2 A. Yes, generally.

3 Q. And with regard to the birds that move
4 through the area on migration, you did some surveys
5 through radar; is that right?

6 A. That's correct.

7 Q. And the radar was used to detect birds at
8 night as they were flying through the project area?

9 A. Yes.

10 Q. Now, the purpose of doing that radar
11 survey was to determine the density of the numbers of
12 birds moving through the area; is that right?

13 A. Generally, yes.

14 Q. And the reason that you were interested
15 in finding out how many birds were flying through the
16 area is because you wanted to determine the potential
17 for those birds hitting the turbines and killing
18 themselves.

19 A. Generally speaking, yes.

20 Q. You are aware that birds on migration do
21 have a tendency to run into the turbines?

22 A. I don't know that I would agree with that
23 statement as it's been made.

24 Q. Okay, well, why don't you correct the
25 statement for me so we make sure we have it accurate

1 for the record.

2 A. Some nocturnally migrating birds have
3 collided with turbines, that's correct.

4 Q. And that's the reason you did your
5 survey, right? Is to determine how much harm there
6 would be to the bird populations flying through.

7 A. We did our survey to determine the,
8 generally the volume of migratory activity within the
9 project area.

10 Q. And the reason that you made that
11 determination was because you wanted to determine how
12 much of a risk the turbines were to the birds flying
13 through the area.

14 A. Yes. The potential level of impact to
15 give some indication of that. That's why the survey
16 was done.

17 Q. Now, how many radar detectors did you use
18 for this purpose?

19 A. We used one.

20 Q. Did you use one in Champaign County?

21 A. I believe it was in Logan County.

22 Q. So the one detector that you used was
23 outside of the Buckeye Wind Project area?

24 A. That's correct.

25 Q. How much of an area is in the Buckeye

1 Wind Project area, do you know?

2 A. How much area is included in the current
3 application?

4 Q. Yes.

5 A. I believe it's something like
6 9,000 acres.

7 Q. Okay. Can you tell me how many square
8 miles that would be?

9 A. Not offhand, no.

10 Q. To help you out with that, would you look
11 at Exhibit N of the application that I believe is in
12 front of you?

13 A. Okay.

14 Q. All right, and Exhibit N is the -- is a
15 2007 Migration Survey Report; is that right?

16 A. Yes.

17 Q. And is that a document that you either
18 prepared or that was prepared under your supervision?

19 A. Yes.

20 Q. Would you look at page 1 of that document
21 please and tell me if you see where it is written how
22 many square miles are in the project area?

23 A. I see that.

24 Q. And how many acres is in the project
25 area?

1 A. It says 53,760.

2 Q. Is that acres again?

3 A. Yes, it is.

4 Q. How many square miles? Do you see where
5 it says there that the project area of 84 square
6 miles?

7 A. Yep.

8 Q. So you had one radar detector covering a
9 project area of 84 square miles and that radar
10 detector was outside of that acreage; is that right?

11 A. That's correct.

12 Q. Let's move on to talk about the bats.
13 You also did a survey of the bats in the project
14 area; is that correct?

15 A. We did several surveys for bats, yes.

16 Q. And it's my understanding, and you tell
17 me whether I'm right, that you did acoustic surveys
18 as well as mist-net surveys; is that right?

19 A. Yes. We also did swarm surveys.

20 Q. And a swarm survey is a survey in which
21 you observed the bats coming out of a cave or a mine?

22 A. We didn't just observe them, we captured
23 them. Yes.

24 Q. All right. And the purpose for that is
25 to find out how many bats in the area are living in

1 those caves or mines?

2 A. Actually the particular purpose of that
3 survey was to find out whether or not Indiana bats
4 were hibernating within that particular cave.

5 Q. Are bats important for the ecosystem?

6 A. Yes, very.

7 Q. Why are they important for the ecosystem?

8 A. A number of reasons. One of the largest
9 reasons is their consumption of insects, at least
10 from a human perspective. Economically they are very
11 important for that reason and ecologically as well.

12 Q. Are they important for agriculture due to
13 the fact that they eat insects?

14 A. Yes, to some extent, yes. It depends
15 what population of bats you're talking about.

16 Q. Sure.

17 A. Particularly the Brazilian free-tailed
18 bats can consume a lot of crop pests. So those
19 species of bats are well known for that.

20 Q. And the Indiana bat has a diet that
21 includes beetles; is that right?

22 A. That's correct.

23 Q. And beetles can be harmful to
24 agriculture?

25 A. They can be.

1 Q. The Indiana bat's diet also influences
2 flies, mosquitoes, gnats, midgen, and noseeums?

3 A. Among other things, yes.

4 Q. And we all know why those are good to be
5 eaten by other creatures.

6 Bats also pollinate plants; is that
7 right?

8 A. Some of them do. Indiana bats do not.

9 Q. But some species of bats do?

10 A. Sure.

11 Q. And that's important for agriculture too,
12 is it not?

13 A. Yes, it is.

14 Q. And like the birds, the bats sometimes
15 fly into turbines; is that right?

16 A. Yes, they do.

17 Q. And so the reason that you did your
18 surveys of bat populations is to attempt to assess
19 the relative risk of bats killing themselves in the
20 turbines.

21 A. Yes, that's correct.

22 Q. And is it true that besides flying into
23 the turbines bats can also experience what's called a
24 barotrauma?

25 A. Yes.

1 Q. What's a barotrauma?

2 A. It's essentially a change in air pressure
3 caused by the turbines, and if the bats are flying
4 within that airspace, they can -- it's a rapid
5 decompression and it can cause their lungs to
6 collapse.

7 Q. When bats either fly into turbines or
8 experience barotrauma, do they drop dead right under
9 the turbine or do they fly a ways before they drop?

10 A. I don't know as that's been definitively
11 determined.

12 Q. Isn't it important to know that for
13 purposes of mortality surveys after the turbines are
14 put up to find out how many bats are being killed by
15 the turbines?

16 A. I would think it would be important to
17 know. I just at this time I don't believe it is
18 known.

19 Q. What's the travel range for the species
20 of bats that you've found in the project area?

21 A. Well, to clarify, we didn't --

22 Q. What species of bats are you talking
23 about?

24 A. I was talking --

25 Q. Well, I understand you found how many

1 species, about nine or so?

2 A. Seven.

3 Q. Seven, okay.

4 Of those seven do they -- do all seven of
5 those species have about the same travel range or is
6 there a difference species by species?

7 A. Well, generally the species that
8 overwinter in caves, cave-dwelling bats, they tend to
9 be shorter distance migrants. They travel to and
10 from their hiberna to their summer breeding places.
11 They can go as far as 300 miles, 350 miles has been
12 documented.

13 The other species of bats that were found
14 in the project area are some call them tree bats,
15 foliage roosting bats.

16 There's several different names for this
17 sort of group of bats but there's three species of
18 Lasiurus bats, and they're cross-continental
19 migrations, so.

20 Q. Let's talk about the surveys that you did
21 for the bats. Let's talk first about the mist-net
22 surveys.

23 Mist-nets are large nets that you put up
24 that birds or bats will fly into and get caught; is
25 that right?

1 A. Yes.

2 Q. And the intent is that you would set the
3 nets up in such a way where the bats would not see
4 them and therefore would not try to avoid them,
5 right?

6 A. Yes.

7 Q. And then after they fly into the nets
8 then you and your team come out and look at them,
9 take them out of the net and catalog them and let
10 them go, right?

11 A. Right.

12 Q. What was the purpose for doing your
13 mist-net survey?

14 A. The purpose was to determine the presence
15 or probable absence of Indiana bats in the project
16 area as well as to understand the species
17 composition.

18 Q. And the Indiana bat's an endangered
19 species; is that right?

20 A. It's federally endangered, yes.

21 Q. I thought it would be useful to talk a
22 little bit about the habitat of the Indiana bat as it
23 has a relevance to actions that need to be taken to
24 protect the Indiana bat in this project area. So why
25 don't we talk briefly about the Indiana bat's

1 habitat.

2 Now, the Indiana bat is one of those bats
3 that during the winter does hibernate in caves?

4 A. Yes.

5 Q. And during the rest of the year it roosts
6 in the trees.

7 A. Yes. It has been documented roosting in
8 other structures besides trees, but mostly trees.

9 Q. And the Indiana bat rests under the bark
10 of a tree; is that right?

11 A. Typically, yes.

12 Q. So it selects trees that have bark that
13 is halfway or so peeled off the trunk of the tree so
14 it can lodge itself underneath that bark.

15 A. Correct.

16 Q. And the trees in which it roosts can
17 include trees that are in forested tracts?

18 A. Yes.

19 Q. And when it nests in or when it rests in
20 a forested tract it usually stays towards the edge of
21 the tract where the sun can reach it and warm it?

22 A. Not necessarily at the edge. That is one
23 of the places that they have selected roosts. They
24 can also roost within a center of a forest and in a
25 canopy gap from a blow down.

1 Q. Okay. So generally speaking, it roosts
2 on edges of forested tracts whether those edges are
3 on the outside or inside around the canopy, a canopy
4 break.

5 A. Yeah, I would say the key thing is solar
6 exposure. So if there's a more mature snag that
7 stands above the rest of a coasted canopy, they could
8 also roost there. So the key there is solar
9 exposure.

10 Q. The Indiana bat also roosts on small
11 clusters of trees?

12 A. Yes, in some cases.

13 Q. And in some cases it also roosts in
14 isolated trees in open areas.

15 A. Yeah, it depends on the habitat
16 connectivity and how close those areas are to larger
17 forest stands, but generally, yes.

18 Q. The Indiana bat also nests in the trees;
19 is that right?

20 A. Yes.

21 Q. The Indiana bat nests in what are known
22 as maternity colonies?

23 A. That's correct.

24 Q. And a maternity colony is a collection of
25 bats that usually include the females and their

1 young?

2 A. Yes.

3 Q. With an occasional male mixed in perhaps?

4 A. Perhaps.

5 Q. But ordinarily the males roost
6 separately, right?

7 A. Ordinarily, yes.

8 Q. How many Indiana bats are commonly found
9 in a maternity colony?

10 A. There have been as many as a hundred
11 documented. And sometimes more than that.

12 Q. And these maternity colonies are also
13 found in forested tracts, right?

14 A. Yes.

15 Q. They would be found on the edges or in
16 canopy breaks?

17 A. Yes.

18 Q. And it's true, isn't it, that most
19 maternity colonies have been found in agricultural
20 areas with fragmented forest?

21 A. Can you repeat that question please?

22 Q. Sure. Isn't it true that most maternity
23 colonies of Indiana bats are found or have been found
24 in agricultural areas with fragmented forest?

25 A. I don't know that I would agree with the

1 statement that "most" have been found. There
2 certainly are healthy populations of summer breeding
3 Indiana bats within agriculture settings, yes.

4 Q. I'm going to hand you what is being
5 marked as UNU Exhibit 53.

6 (Exhibit marked.)

7 Q. Ms. Meinke, I've handed you what has been
8 marked as UNU Exhibit 53. Do you recognize this as
9 part 1 of the U.S. Fish & Wildlife Service's Indiana
10 Bat Draft Recovery Plan, First Revision?

11 A. Yes.

12 Q. And this is a document you used to
13 prepare your reports in this case; is that right?

14 A. Certainly we used this as a reference
15 document, yes.

16 Q. I'd like to refer you to page 67 of that
17 document. Please look at the last paragraph on that
18 page and the first sentence.

19 You see the sentence that says "Most
20 Indiana bat maternity colonies have been found in
21 agricultural areas with fragmented forests"?

22 A. I do.

23 Q. Does that change your view on whether
24 this is true?

25 A. Well, not necessarily. Basically over

1 half of the Indiana bat maternity colonies have been
2 discovered in the last ten years. The first one was
3 discovered in the early '70s, so we're still sort of
4 trying to understand a lot about where Indiana bats
5 prefer to roost.

6 Q. But certainly according to this document
7 a significant number of Indiana bat maternity
8 colonies have been found in agricultural areas with
9 fragmented forests.

10 A. Yes.

11 Q. Okay.

12 A. And I believe that's consistent with what
13 I said.

14 Q. Okay. And in some cases maternity
15 colonies of Indiana bats have been found in isolated
16 trees in open areas; is that right?

17 A. Yes.

18 Q. In fact your testimony says that, right?

19 A. Right.

20 Q. It's true, isn't it, that humans have not
21 come close to finding all the maternity colonies of
22 Indiana bats in Ohio?

23 A. Yes.

24 Q. They're pretty hard to find, aren't they?

25 A. Yes, they are.

1 Q. Let's talk about the travel range for the
2 Indiana bat. The Indiana bat flies around foraging
3 for insects, right?

4 A. Correct.

5 Q. And it also flies around finding water to
6 drink?

7 A. Yes.

8 Q. And sometimes it switches roosts so it
9 travels from roost to roost.

10 A. Correct.

11 Q. Now, I'd like to refer you to your direct
12 testimony on page 13 of that testimony. I'm sorry,
13 answer 13, not page 13.

14 A. Okay.

15 Q. And go to page 5 of that answer where
16 that answer is occurring. I believe that in the
17 second sentence you say that "Indiana bats do not
18 routinely forage in open areas, but prefer to forage
19 among trees, over streams, along habitat edges, and
20 in small clearings in forests."

21 Do you see that?

22 A. I do.

23 Q. And although Indiana bats don't routinely
24 forage in open areas, it's not uncommon for them to
25 forage in open areas, is it?

1 A. It depends what you mean when you say
2 "open areas."

3 Q. Well, what about foraging over
4 agricultural fields, they do do that, do they not?

5 A. They have been documented doing that,
6 yes.

7 Q. Now I'm looking at the next sentence of
8 your testimony which says "Visual observation of
9 Indiana bats suggests that foraging over open fields
10 or bodies of water more than 50 meters (150 feet)
11 from a forest area does occur, although less commonly
12 than in forested sites along edges."

13 You see that?

14 A. I do.

15 Q. Would you go back to Exhibit 53 please
16 and go to page 69. And I'd like to refer you to the
17 second to last paragraph on page 69. And please look
18 at the last sentence of that paragraph.

19 And you'll agree that the sentence from
20 your testimony that I have read is almost taken word
21 for word from the last paragraph -- from the last
22 sentence of that paragraph on page 69 of Exhibit 53?

23 A. Yes.

24 Q. So you did use Exhibit 53 to prepare your
25 written testimony in this case.

1 A. Yes. I've stated that already.

2 Q. Okay. I thought you stated that you had
3 used it to prepare your report for the application.

4 A. Oh, okay. Yes.

5 Q. So you've used it both for -- to prepare
6 your report for the application and to prepare your
7 written testimony.

8 A. It's a reference document I use regularly
9 for many purposes. Yes.

10 Q. It's an important reference for Indiana
11 bats, isn't it?

12 A. It is.

13 Q. Now, did you read the Indiana Bat
14 Recovery Plan to determine how far Indiana bats are
15 found to fly into fields for foraging?

16 Let me to help you out. Why don't you go
17 back to page 69 of that report, that is the page 69
18 of UNU Exhibit 53.

19 Q. And go to the last paragraph on that page
20 where you see the second sentence of that paragraph
21 says "Agricultural lands, intermediate deciduous
22 forests, old field, and water were used in proportion
23 to availability."

24 You see that?

25 A. I do.

1 Q. And that sentence refers to Indiana bats
2 using this type of habitat for foraging; is that
3 right?

4 A. Yes.

5 Q. Now go to page 66 of Exhibit 53. And I'd
6 like you to look at the first paragraph on that page.
7 Go about two-thirds through the first paragraph going
8 to a sentence starting "there are observations." And
9 then tell me when you find that sentence.

10 A. Okay.

11 Q. And it says "There are observations of
12 Indiana bats crossing interstate highways and open
13 fields."

14 Is that right?

15 A. Yes.

16 Q. Have you read that reference from Brack
17 1983 about Indiana bats crossing open fields?

18 A. I believe I have seen it, yes.

19 Q. Now, it's true, isn't it, Indiana bats
20 are known to fly as far as five miles to forage and
21 to go to roosts?

22 A. Yes.

23 Q. In fact, Exhibit 53 also talks about
24 that, doesn't it?

25 A. The Recovery Plan?

1 Q. Yes.

2 A. Yes.

3 Q. Let's talk briefly about the acoustic
4 surveys that you did for the Indiana bat. Now, as I
5 understand it, an acoustic survey uses detector
6 devices to record the calls of bats?

7 A. Correct.

8 Q. And the detector devices that you used
9 can be used to identify at least some of the bat
10 calls that you hear as to the species making the
11 calls?

12 A. Correct.

13 Q. How many detector locations did you use
14 for the project area?

15 A. Two.

16 Q. And one of them was in Logan County?

17 A. That's correct.

18 Q. And that one was outside the project
19 area?

20 A. Yes.

21 Q. So you only used one inside the actual
22 project area.

23 A. Yes.

24 Q. I'd like to refer you to Exhibit N of the
25 application which you should have in front of you in

1 the binder. And I would like you to go to page 30 of
2 that document.

3 You have that in front of you?

4 A. I do.

5 Q. All right. Under the paragraph for
6 "Discussion" -- let me first of all ask you,
7 Exhibit N is a document that you prepared; is that
8 right?

9 A. Yes. I oversaw the preparation of it,
10 yes.

11 Q. Did you review it after it was prepared
12 to make sure it was accurate?

13 A. I did.

14 Q. So paragraph 3.4 has a discussion of your
15 acoustic survey; is that right?

16 A. Yes.

17 Q. And this is the survey that you did in
18 2007?

19 A. That's correct.

20 Q. And according to that paragraph under the
21 heading "Discussion" the overall mean detection rate
22 of bat calls during the survey period was 6.73 calls
23 per detector night?

24 A. Yes.

25 Q. What does that mean?

1 A. It means that on average there were 6.73
2 calls detected per night.

3 Q. And those would be bat calls recorded on
4 the detector devices.

5 A. Yes.

6 Q. Now table 3-4 on that same page provides
7 a similar number for or the same type of number for
8 bat calls detected at other wind farm project areas;
9 is that correct?

10 A. Yes.

11 Q. And you've provided this table for
12 purposes of comparing the number of bats that were
13 detected in the Buckeye Wind Project area to the
14 number of bats found in other project areas for wind
15 farms; is that right?

16 A. Yes.

17 Q. And you concluded that the overall number
18 of bat calls detected in the project area was similar
19 to the number found in other projects; is that right?

20 A. Yes.

21 Q. However, two of the detection devices in
22 your project were not working during a period of high
23 migration activity; isn't that right?

24 A. That's possible. I haven't looked at
25 this in a while, but probably, yes.

1 Q. Well, just look at the last sentence of
2 discussion on that page.

3 A. Okay.

4 Q. See where it says that "The north tree
5 and the south low detectors were not operating during
6 a period of increased bat activity from October 2 to
7 October 9 which could have affected the overall
8 detection rate"?

9 A. I do see that.

10 Q. Now I'd like you to keep your finger
11 where you are right now in that exhibit and go to
12 page 25 of the same report.

13 Table 3-1 is a summary of the bat call
14 detections that were made in your project; is that
15 right?

16 A. Yes.

17 Q. And the column labeled "Detection Rate"
18 in that chart has the number of bat calls that were
19 recorded?

20 A. Yes.

21 Q. I'd like to direct your attention to the
22 number of bats found for the South Tree detection
23 area. You see that?

24 A. I do.

25 Q. The detection rate there was 28.38; is

1 that right?

2 A. That's correct.

3 Q. And that's considerably larger than the
4 number of bat calls found by the other detectors,
5 right?

6 A. Yes.

7 Q. Where was the south tree detector
8 located?

9 A. That was in Logan County and I believe
10 there's a map in the report showing the location. I
11 can't tell you exactly where it is by memory.

12 Q. Well, maybe you should look at that map
13 because doesn't the word "south" imply it was in --
14 that it was the south detector?

15 A. I'm sorry, I apologize, Champaign County.
16 Yes, sorry about that.

17 Q. There is a map though showing your
18 locations, isn't there, in your report?

19 A. Yes. It's on page 22.

20 Q. Let's just turn there briefly. And the
21 south detection area is shown to be directly east of
22 is that Urbana?

23 A. Yes.

24 Q. And you can tell it by the little bat
25 symbol where it's located?

1 A. Yes.

2 Q. Now, if you keep your finger on page 25
3 and compare it to the table on page 30, compare the
4 number of 28.38 bat calls found per detector night at
5 the south tree to the number of bats found per
6 detector night at other projects in the U.S. for wind
7 farms. Okay, have you done that?

8 A. Yes.

9 Q. And you will see that at 28.38 bats per
10 night if you were to apply -- if were you to put that
11 number into the chart, that would be the third
12 highest detection rate found for all of these
13 projects; is that right? If you were considering
14 only the south tree detector?

15 A. Yes, but not necessarily, because each of
16 these values are averages for probably many different
17 detectors so it's hard to say how that one individual
18 detector compares to these values.

19 Q. But it is fair to say that the number of
20 bats found at the south tree detector is high
21 compared to what you find at most of the detectors.

22 A. Again, I can't comment on that because
23 these are averages of many detectors. So I can tell
24 you that the number of calls recorded at the lowest
25 height detector was much higher than those recorded

1 at the higher level detectors.

2 Q. Go back to page 25. The north tree
3 detector was also a low detector, was it not?

4 A. Yes, it was.

5 Q. And that's -- there you found an average
6 of only 3.52 bat calls per night.

7 A. That is correct.

8 Q. Do you have any idea as to why you found
9 more bats calls at the south tree detector than at
10 your other detectors?

11 A. There's a lot of factors that go into why
12 we record higher call numbers at certain detectors.
13 A lot of it is detector placement and proximity to
14 forested areas. It could be if that particular area
15 there happens to be a roost nearby, a lot of things
16 can go into a call rate.

17 Q. Now I'd like you to turn to the
18 application Exhibit P. And Exhibit P is the
19 correspondence between your company and government
20 agencies concerning reports that you did for the
21 project area; is that right?

22 A. That's what it looks like, yes.

23 Q. I'd like you to find the document labeled
24 "Mist Netting Guidelines" in that Exhibit P. Do you
25 have that in front of you?

1 A. I do.

2 Q. This is a copy -- this is a copy of the
3 U.S. Fish & Wildlife Service guidelines for using
4 mist-nets to find bats; is that right?

5 A. Yes.

6 Q. And these were the guidelines that were
7 used to design the mist-net survey for the Buckeye
8 Wind Project area?

9 A. These along with direct communication
10 with the Reynoldsburg Office of the Fish & Wildlife
11 Service.

12 Q. The mist-netting guidelines are standard
13 procedure for mist-netting of bats; is that right?

14 A. Yes.

15 Q. I'd like you to look at the heading on
16 the first page of those guidelines for recommended
17 net site spacing. See that at the bottom?

18 A. Yes, I do.

19 Q. It says that for stream corridors it is
20 recommended that you set up one net site per
21 kilometer of stream; is that right?

22 A. Yes.

23 Q. Bats often follow streams when they fly;
24 is that right?

25 A. Yes.

1 Q. They're corridors for their flight
2 because they feel more comfortable flying there?

3 A. That's correct.

4 Q. Did your survey put up any mist-nets in
5 the stream corridors?

6 A. I believe we did. I don't have that
7 information at hand right at this moment, but I
8 believe that we did. Some of the net sites.

9 Q. Did you set up one net site per kilometer
10 of stream in the project area?

11 A. What we did was worked with the
12 Reynoldsburg Office of the Fish & Wildlife Service
13 and they identified priority forest tracts in which
14 we were to place our mist-nets.

15 Q. And of those priority sites how many of
16 them involved stream corridors?

17 A. I don't have that information right now.

18 Q. Does your report show that information?

19 A. I'm not sure.

20 Q. Under "Recommended Net Site Spacing" it
21 also says that for non-corridor land tracts is
22 recommended that you put in two net sites per square
23 kilometer of forested habitat; is that right?

24 A. That's what it says.

25 Q. Did you follow that recommendation for

1 your project?

2 A. I believe we did.

3 Q. Now if you catch bats in these mist-nets
4 between May 15 and August 15, then you know that you
5 have a nesting colony of Indiana bats in the area; is
6 that right?

7 A. It depends on what type of Indiana bat
8 you capture. If you capture a female and you track
9 it to a roost tree and you do an emergence count and
10 you find out there's a colony there, then, yes, you
11 can assume that.

12 Q. Wouldn't it be unusual to find an Indiana
13 bat in an area during this time of the year if it was
14 not living in the area? And they don't migrate
15 during that time, do they?

16 A. No.

17 Q. So it would be unusual to find them in an
18 area in which they're not living during that time of
19 the year.

20 A. Well, you asked me specifically if it
21 would indicate there was a colony present, and I was
22 clarifying that it wouldn't necessarily indicate a
23 colony.

24 Q. Oh, I see. Okay. But it would indicate
25 that the bat's living in that area.

1 A. Yes.

2 Q. What percentage of the Indiana bats in
3 the forested tract are ordinarily captured in the
4 mist-net survey?

5 A. I don't have an exact figure for you on
6 that.

7 Q. Would you agree if I -- would you agree
8 that approximately five percent of bats passing
9 through the capture area are actually caught in the
10 mist-nets?

11 A. I would agree that it's a relatively
12 small percentage. I can't speak to the five percent.

13 Q. Now you did your mist-net survey for
14 Buckeye Wind in the summer of 2008, right?

15 A. Yes.

16 Q. And at the time that you did your survey,
17 Buckeye Wind intended to site it's wind farm in both
18 Logan and Champaign County?

19 A. Yes. There was a larger area under
20 consideration for wind turbine development at the
21 time.

22 Q. At any rate, your mist-nets survey
23 covered areas in both counties, right?

24 A. Yes.

25 Q. Please turn back to Exhibit P of the

1 application. And I would like you to find the letter
2 dated January 18, 2008.

3 A. Okay.

4 Q. Go to page 3 of that document. Do you
5 have that?

6 A. I do.

7 Q. All right. Look at the third page of
8 that document and go to the second paragraph.
9 Actually the first full paragraph which starts with
10 the words "mist-net surveys."

11 A. Uh-huh.

12 Q. All right. Now, this paragraph describes
13 the number of mist-net sites that you set up, right?

14 A. Uh-huh.

15 Q. Yes?

16 A. Yes.

17 Q. Okay. And thinking back to the mist-net
18 guidelines from the U.S. Fish & Wildlife Service for
19 non-corridor forested tracts, it was recommended that
20 you set up two net sites per square kilometer of
21 forest habitat; is that right?

22 A. Yes.

23 Q. And if you had done that, then you would
24 have set up at least 33 net sites within the project
25 area; is that correct?

1 A. Well, yes.

2 Q. But you only set up approximately half of
3 that, right?

4 A. Well, actually we had 17 sites at which
5 there were two nets placed at each of those sites.

6 Q. Okay. And when the guidelines talk about
7 a net site, they're talking about two nets per site;
8 isn't that right?

9 A. That's correct.

10 Q. So what you actually did was
11 approximately half of what the guidelines
12 recommended.

13 A. Well, not necessarily. I mean we worked
14 with the Reynoldsburg Office of the Fish & Wildlife
15 Service and we identified 17 priority forest tracts
16 in which to sample and the level of effort that we
17 used for our sampling was in accordance with their
18 recommendations.

19 Q. Okay. So you followed their
20 recommendations but their recommendations did not
21 follow the U.S. Fish & Wildlife's recommendations in
22 the mist-netting guidelines, did it?

23 A. Well, the reason that the number of sites
24 may have been less than the total number of square
25 kilometers that's reported here, you know, that was

1 part of the discussion with Fish & Wildlife Service
2 as to the most appropriate habitat within the project
3 area for capturing Indiana bats.

4 So it was an evolving discussion of where
5 the most suitable habitat was and what the
6 appropriate sampling effort was for that area.

7 Q. Well, go back to the mist-netting
8 guidelines please. I'd like you to go to the second
9 page of those guidelines.

10 At the top of the page under "Minimum
11 Level of Effort" you will see that it says "Netting
12 at each site should consist of at least four net
13 nights, a minimum of two net locations at each site,
14 and a minimum of two nights of netting."

15 Do you see that?

16 A. Yes.

17 Q. So the guidelines recommend that you set
18 up one net site per kilometer of stream and two net
19 sites per square kilometer of non-corridor forest
20 habitat and each one of those net sites should
21 include a minimum of two net locations; is that
22 right?

23 A. Yes.

24 Q. And what you did in connection -- in
25 conjunction with the recommendations of the

1 Reynoldsburg Office was to set up 17 net sites for
2 forested tracts that had two net sites each.

3 A. Yes.

4 Q. So it was a difference of 17 versus 33
5 that were recommended by the Fish & Wildlife
6 guidelines.

7 A. Well, what I can tell you is we worked
8 with the Reynoldsburg Office of the Fish & Wildlife
9 Service to determine our netting effort, and it was
10 deemed suitable. We went out with them and we
11 selected mist-net sites with Fish & Wildlife Service.
12 So that's what I can tell you.

13 Q. Yeah, I understand. I think you've
14 explained that adequately to us.

15 But it's true that the recommendations
16 from the Reynoldsburg Office that you were following
17 did not literally follow the mist-net guidelines; is
18 that right?

19 A. Well, it appears that there is a
20 discrepancy there, but as I said, there are a number
21 of considerations that went into the amount of
22 forested habitat that was being considered or the
23 amount of suitable habitat in the project area.

24 Q. What do you regard as being "suitable
25 habitat" for the Indiana bat as you used it in your

1 last answer and which I think may be reflected in
2 your report as well?

3 A. Well, the general guidance given by
4 Fish & Wildlife for areas likely to be suitable for
5 maternity colonies are those forest stands greater
6 than a hundred acres that also support water futures.

7 Q. And in the project area you found 16.3
8 square kilometers of what you have just defined as
9 suitable habitat for the Indiana bat?

10 A. I don't have that number in front of me.

11 Q. Okay. Well, go back to the letter of
12 January 18, 2008, page 3. Look at the same paragraph
13 that we've been discussing, and do you see in the
14 second line of that paragraph the answer to the
15 question?

16 A. Yep.

17 Q. So at 16.3 square kilometers of what you
18 have termed as suitable habitat for maternity
19 colonies of Indiana bats within the project area; is
20 that right?

21 A. Yes.

22 Q. However, that is not the entirety of all
23 the forested area in the project area; is that right?

24 A. No.

25 Q. Do you know how many square kilometers or

1 miles or acres of forested habitat there is in the
2 project area?

3 A. I don't have that exact number, no.

4 Q. Is it fair to say that the 16.3 square
5 kilometers that was designated suitable habitat for
6 Indiana bats within the project area is only a
7 fraction of the forested area or treed area in the
8 project area?

9 A. It represents probably the majority of
10 forested habitat.

11 Q. Do you have any idea what percentage of
12 the forested area it represents?

13 A. No, I don't.

14 Q. And as you've already stated, maternity
15 colonies can sometimes occur in just one isolated
16 tree, right?

17 A. Yes.

18 Q. So your mist-nets may not have been set
19 up in the right area to detect a maternity colony if
20 it were located in an isolated tree or in a -- in
21 trees in a smaller forested tract.

22 A. Well, it's very difficult to capture
23 Indiana bats in areas of isolated trees. You have to
24 create an area that funnels in the bat movement.

25 Q. Just one more reason why they're hard to

1 find, right?

2 A. Yeah.

3 Q. And so you would not have expected to
4 find a colony that may have been roosting in an
5 isolated tree or in a clump of just a few trees.

6 A. Well, no, not necessarily. Because we
7 mostly capture bats that are foraging at night or
8 traveling. So we could catch a bat that was roosting
9 in an isolated tree or one that was roosting in a
10 forest stand.

11 So where they go after we capture them is
12 not necessarily related to where we -- the location
13 where we capture them.

14 Q. Now that you've had the opportunity to
15 read the description of your mist site areas in the
16 letter of January 18, 2008, does that refresh your
17 recollection as to whether any mist-net sites were
18 set up on stream corridors?

19 A. I'm sorry, what is the question?

20 Q. Now that you've had a chance to look at
21 the letter that we've been discussing, does that
22 refresh your memory as to whether any mist-nets were
23 set up for Indiana bats on stream corridors in the
24 project area?

25 A. No.

1 Q. Doesn't refresh your memory?

2 A. (Shakes head.)

3 Q. Okay. Now, in that same paragraph of the
4 letter I'd like you to look at the third sentence.
5 It's the sentence starting "within the identifying
6 woodlots."

7 Do you see that sentence?

8 A. I do.

9 Q. According to that sentence the mist-nets
10 were set up only in areas located within proximity to
11 proposed wind turbine sites; is that correct?

12 A. Okay, yes.

13 Q. What was considered to be "within
14 proximity to proposed wind turbine sites"?

15 A. I'm not sure what rationale was used.

16 Q. Now, your mist-net survey did find some
17 Indiana bats, didn't it?

18 A. Yes, it did.

19 Q. And the ones that you found were located
20 in Logan County?

21 A. That's correct.

22 Q. And so those are outside the present
23 project area from Buckeye Wind?

24 A. Yes.

25 Q. How many did you find there?

1 A. We found a total of three.

2 Q. That's the number that you found in the
3 mist-nets?

4 A. That's correct.

5 Q. And did you track those bats back to
6 their roosts?

7 A. Yes.

8 Q. Were any of them females?

9 A. Two were.

10 Q. Did you find a maternity colony?

11 A. Yes.

12 Q. How many Indiana bats did you find in the
13 maternity colony?

14 A. I believe the largest cumulative count
15 was, I think it was 43.

16 Q. Why don't you go to Exhibit X please in
17 the binder in front of you. In the application. Go
18 to page 15 of that document. And that shows that
19 your recollection's correct, that there were 43 bats
20 found in that colony; is that right?

21 A. Yes.

22 Q. How far did you find that those bats
23 traveled to get from the capture location to the
24 maternity colony?

25 A. It appears that the mean distance from

1 the roosted capture site for the male was
2 approximately 2,000 meters, and for the females 2,400
3 and about a thousand.

4 Q. One of these bats averaged 13,773 feet
5 per day; is that right?

6 A. Yes.

7 Q. And that's about two miles, isn't it?

8 A. Yes.

9 Q. So you or somebody under your supervision
10 tracked these bats through a radio transmitter of
11 some sort that you had attached to them; is that
12 right?

13 A. Yes.

14 Q. Describe the route that the bats followed
15 to get from the capture area to the maternity
16 colonies.

17 A. I don't know that I can describe that
18 route to you.

19 Q. Did they cross fields in that route?

20 A. I believe there were instances of the
21 bats being tracked into open areas. I can't tell you
22 the distance from those locations to an adjacent
23 forest stand.

24 Q. Now, go back to Exhibit P please. And
25 find the letter dated April 9, 2009. Do you have

1 that?

2 A. I do.

3 Q. Now, this letter was written after you
4 found the Indiana bats in that area, correct?

5 A. Yes.

6 Q. And I'd like you to go to page 2 of that
7 letter to the second full paragraph.

8 After you found these Indiana bats you
9 were informed by ODNR and Fish & Wildlife Service
10 that the wind turbines would have to stay at least
11 five miles away from an area in which the Indiana bat
12 had been found; is that correct?

13 A. Well, what they said in fact was that in
14 order to avoid going through a formal consultation,
15 that turbines should be at least five miles.

16 Q. And the reason they told you that is
17 because according to this paragraph in the second and
18 third sentence it is says "A buffer of 5 miles is
19 applied to all Indiana bat locations. The buffer
20 distance was determined through published accounts of
21 the maximum foraging distance Indiana bats will
22 travel from a roost tree."

23 Is that right?

24 A. Yes.

25 Q. And then in the next paragraph it is

1 stated that there was one turbine where the Fish &
2 Wildlife Service was going to allow Buckeye Wind to
3 put that turbine within the five miles but it would
4 have to be right on the edge of the five-mile buffer;
5 is that right?

6 A. Yes.

7 Q. And after that occurred then you're aware
8 that Buckeye Wind at that point at least decided to
9 take those turbine sites in that area out of the
10 project; is that right?

11 A. Yes.

12 Q. Now I'd like you to go to your written
13 direct testimony and find answer 9. And I'd like to
14 read to you the second to last sentence of your
15 answer which says "The proposed Project adheres to
16 the U.S. Fish & Wildlife recommended setback distance
17 of five miles from the Indiana bat capture and roost
18 locations identified in the summer 2008 mist-netting
19 study."

20 Do you see that?

21 A. Uh-huh.

22 Q. Now, this was -- okay, and then the next
23 sentence you say "Based on this, U.S. Fish & Wildlife
24 Service concluded in an April 9, 2009 memo that no
25 impacts to Indiana bats or their habitat are

1 anticipated for the proposed Project."

2 Right?

3 A. Uh-huh.

4 Q. Now go back to Exhibit P and find that
5 April 9, 2009 letter. And that's the same letter
6 that we've been discussing, right?

7 A. Yes.

8 Q. Go to page 2 of that letter and the third
9 full paragraph on that page. Please look at the last
10 sentence of that paragraph. Do you have that
11 starting with the words "based on the siting"?

12 A. Yes.

13 Q. And it says "Based on the siting of this
14 turbine relative to the buffer line, and the general
15 lack of suitable Indiana bat in close proximity to
16 the proposed turbine location, the Service agrees
17 that Indiana bats are unlikely to be impacted by this
18 turbine."

19 That's the turbine we've been talking
20 about that they were going to let you put in close to
21 the edge of the buffer, right?

22 A. Uh-huh.

23 Q. Now let's go to another sentence in the
24 next paragraph. Last sentence or the second to last
25 and the last sentences of that paragraph.

1 You'll see that it says "The Service
2 firmly believes that as the project is currently
3 proposed, Indiana bats are unlikely to occur within
4 the project area and that take of Indiana bats will
5 not occur. At this time, we do not believe that
6 additional consultation relative to the Indiana bat
7 is warranted for this project."

8 You see that?

9 A. Uh-huh.

10 Q. So when you say that in your testimony
11 that the U.S. Fish & Wildlife Service concluded no
12 impacts to Indiana bats or their habitat are
13 anticipated for the proposed project, that conclusion
14 by the Fish & Wildlife Service was based on the
15 information they had at the time they wrote this
16 letter of April of 2009, right?

17 A. That's correct.

18 Q. Since that time there have been Indiana
19 bats found in Champaign County, haven't there?

20 A. Yes.

21 Q. And those -- do you know when those bats
22 were found? Approximately July of 2009; is that
23 right?

24 A. Yes.

25 Q. So it occurred after this letter was

1 written.

2 A. That's correct.

3 Q. And the conclusion of the Fish & Wildlife
4 Service of this letter was based on the fact that at
5 that time no Indiana bats had been found around the
6 project area.

7 A. Correct.

8 Q. Do you know how many Indiana bats have
9 been found in Champaign County?

10 A. No, I don't.

11 Q. Now, go to question and answer 12 of your
12 testimony. Question 12 asks "Are you aware of any
13 Indiana bats captured in the Applicant's specific
14 Project Area in Champaign County?"

15 And your answer to that question is "No."

16 What's your understanding of what the
17 word "specific" was meant to imply in or meant to
18 state in that question?

19 A. My understanding of the specific project
20 area are the turbines as they're laid out in the
21 application, plus a certain buffer distance around
22 them.

23 Q. And what's the buffer distance around
24 them that you believe is included in the term
25 "specific project area"?

1 A. I believe it's 914-foot distance.

2 Q. So your testimony in answer 12 says that
3 you don't know about any Indiana bats found within
4 914 feet of the proposed turbine site.

5 A. That's correct.

6 Q. Do you know how far from any of the
7 turbines, turbine sites any of the Indiana bats were
8 found?

9 A. I do.

10 Q. Okay, how far away?

11 A. I believe the closest maternity colony is
12 1.75 miles, the closest roost site is 1.2 miles, and
13 the closest capture location I believe is a quarter
14 mile.

15 Q. So all of these locations are within five
16 miles of a turbine site.

17 A. That's correct.

18 Q. Do you know how many maternity colonies
19 of Indiana bats have been found?

20 A. I don't.

21 Q. Do you know how many roost areas have
22 been found?

23 A. No.

24 Q. Do you know which turbines are close to
25 the maternity colony, roost, or capture areas?

1 A. No.

2 Q. Have you had discussions with either ODNR
3 or the Fish & Wildlife Service about the Indiana bats
4 that were found in Champaign County?

5 A. Yes.

6 Q. What have been the nature of those
7 discussions?

8 A. We were informed after the capture of the
9 Indiana bats this summer that they were captured and
10 that it would likely affect the current project.

11 Q. Did either of the government agencies
12 tell you how it would or how it could affect the
13 project?

14 A. Yes.

15 Q. And what were you told in that regard?

16 A. We were told that it would likely mean
17 that they would have to go through formal
18 consultation and either via Section 7 or Section 10
19 of the Endangered Species Act.

20 Q. Was there any discussion about whether or
21 not Buckeye Wind should abandon its plans to install
22 any of the turbines in the project area?

23 A. No.

24 Q. Did you ask either of the government
25 agencies about the number of maternity colonies of

1 Indiana bats that were found?

2 A. No.

3 Q. Why not?

4 A. It was evolving information. It was
5 still -- it was told to us during the capture season
6 and the total number of bats caught and maternity
7 colonies was still yet to be determined.

8 Q. Do you know how many Indiana bats were
9 found in colonies in that area?

10 A. I really don't.

11 Q. But according to your earlier testimony
12 it could be anywhere up to a hundred bats?

13 A. Possibly, yes.

14 Q. Do you know which portion of the project
15 area the bats were found in?

16 A. I believe at one point I was told in the
17 north/northwest portion area, but again I don't know
18 which bats or how many bats relative to the total
19 number that were captured.

20 Q. Okay. So, so far as you know they could
21 have been anywhere in the project area.

22 A. Yes.

23 Q. Do you have an explanation for why your
24 company did not find any Indiana bats when you did
25 your survey whereas somebody else was able to find

1 them?

2 A. There's a lot of possible reasons that
3 that could be the case.

4 Q. What are those reasons?

5 A. One of them is that because roosts are
6 ephemeral and they roost in dead trees and from year
7 to year those trees can fall over or be cut.

8 There could have been a roost tree that
9 was there last summer in a different area that was
10 not there this summer, therefore, the bats had to
11 move to a different roost tree. That's one possible
12 reason.

13 Q. So from year to year the bats really
14 could go anywhere in the project area.

15 A. They can move around quite a bit, yeah.

16 Q. Do you know how far the bats were found
17 from any of your mist-net sites?

18 A. Any of our mist-net sites. I believe the
19 one that I'm referring to that was captured in the
20 northwest portion was relatively close to one of our
21 capture sites. I don't have an exact distance.

22 Q. Can you identify that mist-net site?
23 Where it was?

24 A. No, I don't know the exact site. I was
25 just told by ODNR that it was relatively close to one

1 of our mist-net sites.

2 Q. Is that one of the -- is that in the
3 northwest part of the project area?

4 A. I believe it is.

5 Q. Have you had any discussions with ODNR or
6 the Fish & Wildlife Service about keeping a buffer
7 zone between the turbines in the area where the
8 Indiana bats have been found?

9 A. We've talked about a number of different
10 posts for avoiding and minimizing of take, and that
11 could be one of them.

12 Q. What are the other ideas that were thrown
13 out to minimize the take of Indiana bats?

14 A. Well, there's a lot of -- a whole range
15 of options. Some of them are habitat preservation in
16 a conservation bank, habitat enhancement through
17 forest management practices that create more suitable
18 conditions for Indiana bat foraging and roosting.

19 We talked about curtailment options for
20 turbines that are particularly close to suitable
21 Indiana bat habitat. Education programs, funding of
22 research.

23 Those are some of the options that were
24 discussed.

25 Q. Let's talk a little bit more about the

1 curtailment options for turbines close to the bats.

2 What do you mean by "curtailment options"?

3 A. Curtailment is, I think was discussed on
4 the first day of the hearing. Essentially it's the
5 speed, the wind speed at which the turbines become
6 operational and start feeding power into the
7 electrical grid.

8 Q. And that has been shown, has it not, to
9 be an effective way to reduce bat kills?

10 A. Yes, it has. It's limited information at
11 this point, but what we have so far looks as if it
12 does reduce bat mortalities substantially.

13 Q. And is it true that under this
14 curtailment option a turbine would not be turned on
15 until the wind speed reached at least four meters per
16 second?

17 A. Which curtailment option are you
18 referring to?

19 Q. The one that you're discussing concerning
20 not turning the turbines on until it reaches a
21 certain wind speed.

22 A. There haven't been any curtailment
23 options that have been identified at this point. I'm
24 not sure which one you're referring to.

25 Q. Well, let me go back and perhaps I didn't

1 phrase the question very well.

2 I asked you whether it has been shown
3 effective to turn the turbines on at only a certain
4 wind speed to reduce the number of bats that were
5 killed. Remember that?

6 A. Yes.

7 Q. Okay, and if that option were to be used,
8 it has been shown that turning the turbine on at the
9 wind speed reaching four meters per second will be an
10 effective way to reduce bat kills.

11 Do you agree with that?

12 A. No, that's not --

13 MR. PETRICOFF: I'm sorry, go on.

14 A. That's not consistent with my
15 understanding of the research that's been done.

16 Q. What's your understanding of the
17 research?

18 A. Well, there's only -- really there's
19 limited studies. The most -- the one in the area
20 most similar to the project is in Pennsylvania. It
21 was done by Ed Arnett and there's only one season of
22 data that's been produced from that study.

23 But the two cut-in speeds that were used
24 were 5-meter per second and 6.5, and he found there
25 was no statistical difference in using those two

1 cut-in speeds.

2 Q. Both of them were effective in reducing
3 bat kills?

4 A. Correct.

5 Q. Go to question and answer 17 of your
6 testimony please. Here you discuss a post
7 construction avian and bat mortality survey plan; is
8 that right?

9 A. Yes.

10 Q. And such a plan is, generally speaking, a
11 plan after -- that's put into action after the
12 turbines start operating, right?

13 A. Yes.

14 Q. And you say that such a plan will be
15 instituted in this case for the Buckeye Wind Project?

16 A. Yes.

17 Q. Now, what's your understanding as to what
18 will be included in that plan?

19 A. Well, at the very least there will be
20 searches for bird and bat carcasses beneath the
21 turbines.

22 Q. Okay.

23 A. There could be a whole range of other
24 measures that are taken to document mortality or
25 avoidance of the turbines.

1 Q. Has this plan been drafted yet?

2 A. No, it has not.

3 Q. Has it been discussed with any of the
4 agencies?

5 A. It's been discussed insofar as it's
6 agreed that one would need to be in place.

7 Q. Now, if the only thing that you do in
8 your plan is pick up the carcasses and count them,
9 that doesn't do anything to reduce the bat and bird
10 deaths, does it?

11 A. Well, it's an iterative process.
12 Adaptive management would be a key part of the
13 habitat conservation plan so that if there were a
14 number of bats that exceeded what the Fish & Wildlife
15 Service deemed was suitable or appropriate, then
16 additional measures would be taken.

17 Q. So it would be your understanding that
18 this plan would not only require you to count the
19 deaths but do something about them.

20 A. Most likely. Depending on what species
21 were killed and the numbers that were found.

22 Q. But at this point there's been no plan
23 drafted to incorporate any of those corrective
24 measures in the event that the bat and bird deaths
25 are found to be unacceptably high.

1 A. The plan has not been drafted yet. It's
2 assumed there will be one.

3 Q. Is it your understanding that the plan
4 will comply with all of the requirements of the
5 document you've named in answer 17, that is the ODNR
6 "On-Shore Bird and Bat Pre- and Post-Construction
7 Monitoring Protocol for Commercial Wind Energy
8 Facilities in Ohio"?

9 A. Yes.

10 Q. I'm going to hand you what's been marked
11 as UNU Exhibit 54.

12 (Exhibit marked.)

13 Q. Do you recognize UNU Exhibit 54 as a copy
14 of the protocol for On-Shore Bird and Bat Pre- and
15 Post-Construction Monitoring Protocol for Commercial
16 Wind Facilities in Ohio?

17 A. Yes.

18 Q. Do you know whether it is Buckeye Wind's
19 intent to comply with this protocol?

20 A. Yes, I do.

21 Q. And is it Buckeye Wind's intent to comply
22 with this protocol?

23 A. Yes.

24 MR. VAN KLEY: Thank you, I have no
25 further questions at this time.

1 ALJ STENMAN: Ms. Napier?

2 MS. NAPIER: Thank you, I just have a few
3 questions.

4 - - -

5 CROSS-EXAMINATION

6 BY MS. NAPIER:

7 Q. I'm a little confused. I think you had
8 previously stated that the Department of Interior had
9 suggested or set a five-mile buffer zone for the
10 Indiana bat. I think that's set out in their April 9
11 letter; is that correct?

12 A. Yes.

13 Q. Do we still have a five-mile buffer zone,
14 now that the Indiana bat has been located in
15 Champaign County, for the project area?

16 A. No. There are Indiana bats within five
17 miles of the current project area.

18 Q. Okay. Can you tell me why that has
19 changed?

20 A. Because they were captured by another
21 developer within proximity to the current
22 application.

23 Q. Why does that change? That somebody else
24 caught them?

25 A. Because they're now known to occur there.

1 They weren't when this application was filed.

2 Q. Okay. But are you saying that turbines
3 should be -- are okay to be located within that
4 five-mile buffer zone?

5 A. No, I'm not saying that. I'm saying that
6 now that they are, the applicant would have to go
7 through the formal consultation process with Fish &
8 Wildlife Service to be in compliance with the ESA.

9 Q. And I believe you stated that bats were
10 found approximately a quarter of a mile from a
11 proposed turbine; is that correct?

12 A. Capture site, yep.

13 Q. And that's about 1,300 feet
14 approximately?

15 A. Correct.

16 Q. And is that a sufficient amount of
17 distance from that turbine in your opinion?

18 A. It's really not up to me. It's up to the
19 Fish & Wildlife Service.

20 Q. I guess I'm asking you for your opinion
21 though as an expert.

22 A. I would say without appropriate avoidance
23 and minimization measures in place, it's probably
24 closer than would be recommended.

25 Q. And you had said something about it

1 wasn't within 914 feet. Did you look at that
2 distance for some reason?

3 A. I believe that is how the current
4 application defines the project area.

5 Q. That it be 914 feet from a residential
6 property?

7 A. Well, the maps that I've seen of the
8 project area show the turbines in a 914-foot buffer
9 around them, and that is how the project area has
10 been defined.

11 Q. And we have been talking here mainly
12 about 914 feet from a residential structure. Are you
13 aware of that?

14 A. Yes.

15 Q. Okay. Isn't it different, I mean a
16 residential structure that is permanent and a bat
17 roost or even bat migration, I mean it is not -- that
18 is not a permanent type of activity, correct? Or I
19 guess stationary type of activity, correct?

20 A. I don't think I understand your question.

21 Q. We've been talking about 914 feet from a
22 residential structure. That is 914 feet when you're
23 talking about bats and their habitat and their
24 activities.

25 You really can't say that they're going

1 to maintain a 914-foot distance from a wind turbine;
2 is that correct?

3 A. Yeah, I in no way have implied that the
4 bats will respect a 914-foot distance.

5 Q. If only they could.

6 And so really, looking at 914 feet really
7 bats shouldn't even be a consideration. Is that a
8 fair statement?

9 A. That wasn't the question I was asked. I
10 was asked whether or not Indiana bats were documented
11 in a specific project area. My answer is that they
12 weren't.

13 And I can tell you that a capture
14 location was also a quarter mile from a proposed
15 turbine. That's the information that I have.

16 Q. Okay. And I see from one of the
17 exhibits, I believe it's Exhibit P, it's the
18 January 18, 2008 letter from the Department of the
19 Interior, that there were no recorded bat sitings or
20 bat capture in Logan or Champaign County; is that
21 correct?

22 A. Let's see.

23 Q. And I'll refer you to the second page of
24 that letter, second to last paragraph.

25 A. Oh, as far as going into the project what

1 they had previously documented.

2 Q. Right.

3 A. Correct.

4 Q. And this was in January of 2008.
5 Correct? And that thereafter became incorrect
6 because studies were done and bats were first located
7 in Logan County, correct?

8 A. Correct.

9 Q. And then now we've found them in
10 Champaign County, correct?

11 A. Correct.

12 Q. Doesn't that seem to show that you
13 yourself and the Department of the Interior and the
14 Department of Fish & Wildlife are still in an
15 information gathering phase on the Indiana bats in
16 this region?

17 A. Yeah, I would say that's fair to say.

18 Q. So we may -- we haven't determined at
19 least where all the roosts are in Champaign County to
20 your -- in your opinion, correct?

21 A. I would agree with that.

22 Q. And in Exhibit X on page 15 I noticed
23 that there is documented that the furthest mean
24 distance of a male Indiana bat was approximately
25 4.2 miles. It's at the end of the first paragraph.

1 A. Okay.

2 Q. And so can you tell me what that in fact
3 means?

4 A. I'm sorry, I said "okay" but I didn't
5 find where you were in the document.

6 Q. The very last sentence of the first
7 paragraph on 15, right at the end of that sentence.
8 Says "...the furthest mean distance traveled between
9 day-roosts was by a male Indiana myotis" for
10 approximately 4.198 miles; is that correct?

11 A. Well, that's meters actually.

12 Q. I'm sorry, meters. It says 1,000 feet.
13 That's probably even --

14 A. That's about two and some miles, right?

15 Q. Can you tell me what that means?

16 A. Well, it means that each day we would --
17 during the day we would track the bat to where it was
18 roosting during the day. They don't move during the
19 day, they come out at night.

20 So if you lose the bat while you're radio
21 tracking them at night, because they fly very
22 quickly, at least you have that information to
23 determine the maximum distance that they traveled
24 from one day to the next.

25 Q. So their mean distance of traveling was

1 13,000 plus feet, correct?

2 A. Correct.

3 Q. And so there may be some more than that,
4 some less than that, but perhaps -- and that seems to
5 be approximately two and a half miles. That seems to
6 be a lot longer than the 1,300 feet that we talked
7 about as where the capture or the roosting site
8 was --

9 A. Uh-huh.

10 Q. -- to the turbine.

11 A. Yeah.

12 Q. So isn't it fair to state that these
13 Indiana bats will be going around these wind
14 turbines?

15 A. I would say that's fair to state.

16 Q. We wanted to establish for the record we
17 had talked about the south tree detector location is
18 on page 22 of Exhibit N.

19 Is that south tree detector near the
20 intersection of U.S. 36 and what we believe to be
21 Mutual-Union Road? Do you have any idea?

22 A. I think it is. Yes.

23 Q. And that's in Union Township?

24 A. I believe so.

25 Q. And that is within the project area to

1 your knowledge?

2 A. To my knowledge it is.

3 Q. You had previously stated that there was
4 some discrepancy between the guidelines for mist-net
5 sitings and what was actually done by you or your
6 company in P.

7 I'm not really sure what you mean by that
8 there's "some discrepancy." I see that it was
9 supposed to be 33 net sites and that met the
10 guidelines that you had set forth in this in the
11 application but in fact you only put in 17. Or you
12 only have 17.

13 Can you tell me, is that the discrepancy
14 that you're talking about?

15 A. Well, the discrepancy that I was talking
16 about was the amount of habitat that was ultimately
17 deemed to be suitable for Indiana bats and for
18 mist-netting.

19 Q. And isn't it true that your calculations
20 are different than what the guidelines set forth?

21 A. As it's stated in that letter, yes.

22 Q. So let me just make it clear, and I think
23 this is a "yes" or "no" question.

24 So according to your information, did you
25 not follow the guidelines set forth by the Department

1 of Fish & Wildlife?

2 A. Well, what we did was we followed the
3 recommendations --

4 Q. I'm sorry, it's a "yes" or "no" question.

5 MR. PETRICOFF: I'll object, your Honor.
6 The witness should be allowed to answer.

7 MS. NAPIER: I guess I'm going to keep
8 asking her the question. I believe she's being
9 nonresponsive.

10 ALJ STENMAN: The objection's overruled
11 but can you take it up on redirect.

12 A. My answer is that question followed the
13 recommendations of the Department of the Interior, of
14 the U.S. Fish & Wildlife Service, the Reynoldsburg
15 Field Office.

16 Q. Okay. But that is different than the
17 guidelines that are set forth in the application in
18 Exhibit P following the letter of January 18, 2008;
19 is that correct?

20 A. It is, but I would like to draw your
21 attention to the letter dated on April 9, 2009 by the
22 same Office of the Fish & Wildlife Service, which
23 concurred with the level of effort that we put forth
24 and said that it was adequate.

25 Q. Okay. Was there any other requests for

1 waiver or anything on this matter to go from 33 to 17
2 net sites?

3 A. I don't believe so, no.

4 Q. I'd like to turn your attention to birds
5 if I may. Your study looked at some birds; is that
6 correct?

7 A. (Nods head.)

8 Q. And did you look at whether there were
9 eagles in the project area?

10 A. Yes.

11 Q. Did you locate any eagles in the project
12 area?

13 A. I believe we documented one or two during
14 our winter surveys.

15 Q. And are eagles a federally protected
16 species?

17 A. Well, they've been removed from the
18 Endangered Species List. There is currently
19 something called the Bald and Golden Eagle Protection
20 Act that is in place, yes.

21 Q. Did your eagles -- do you have any plan
22 for the eagles at this point in time, do you believe
23 you do need to be required or is there a requirement
24 for a plan?

25 A. In our discussions with Fish & Wildlife

1 Service I don't believe there is any plan. The
2 documentation of one or two eagles flying above the
3 project area I wouldn't say demonstrates a high use
4 of the area by eagles.

5 Q. As opposed to bats is there some reason
6 why the fact there are some found would not lead you
7 to believe there are others in the project area?

8 A. I am not sure I understand your question.

9 Q. Well, you had previously stated when you
10 found bats there may be others because there is
11 certainly a percentage that you probably are not
12 going to be able to locate. Is that a fair
13 statement?

14 A. Sure, uh-huh.

15 Q. Is that true with eagles?

16 A. I think you have to go back to the
17 ecology, the species, and when birds are migrating
18 they typically migrate at higher altitudes and
19 density of that particular species is an important
20 factor as well.

21 When we're talking about bats that are
22 using an area for summer roosting, the assumption is
23 that the abundance and relative proportion of bat
24 species in the project area would probably be greater
25 than a single eagle flying over during migration.

1 So while there may have been other eagles
2 that weren't documented, the sampling effort was very
3 intensive and that's what was found.

4 Q. Would you be surprised that an eagle was
5 spotted in Champaign County in the last few days and
6 the picture has been published in the Champaign
7 County -- I'm sorry, the Urbana Daily Citizen which
8 is a newspaper in Champaign County? Would you be
9 surprised to learn that?

10 A. No, not necessarily.

11 Q. Is it a time for an eagle to be in this
12 part of the state?

13 A. Well, they're typically cool season
14 migrants so they typically migrate a little bit
15 later.

16 Q. One of the reasons why I'm asking about
17 that is in Exhibit M, table 6, we did not see an
18 eagle listed as one of those animal species within
19 five counties adjacent to the project area.

20 A. Can you repeat the page number and the
21 exhibit?

22 Q. I'm sorry, it's table 6 in Exhibit M as
23 in "Mary."

24 A. Table 6. Do you have a page?

25 Q. There is no page. It's 1 of 1. I don't

1 know if that helps you.

2 ALJ STENMAN: It's after the maps.

3 A. Okay.

4 Q. It's after the narrative.

5 A. Okay.

6 Q. I'm sorry, did you find it?

7 A. Table 6, yes, I did.

8 Q. I'll let you take a look at that.

9 Is the eagle on there?

10 A. I haven't found it yet.

11 No, I don't see it.

12 Q. With the status being that it's just come
13 off the Endangered Species List, wouldn't you say
14 that it would be a species that should have been
15 looked at? And if you found it should have been
16 located in this material?

17 A. Well, I didn't prepare this material here
18 that we're looking at, so I can't really answer why
19 it's not included in this list.

20 Q. Okay.

21 A. But I can tell you that the surveys that
22 we did were sufficient to document their presence in
23 the project area and we did document one or two, as I
24 said.

25 Q. Did you put this in your exhibits?

1 Because we didn't find anything about it in your
2 exhibits either.

3 A. This table, did I put this table in my
4 exhibits?

5 Q. Uh-huh.

6 A. No.

7 Q. Thank you. I'm sorry, do any of your
8 exhibits show that?

9 A. It should be in our report. It was
10 either in 2007 or 2008. Somebody can direct me to
11 where -- let's see.

12 Okay, so if you go to page -- Exhibit O,
13 and you go to the appendices, this is one place I
14 have found it. And it's actually Appendix B, the
15 first table.

16 And there's the list of the different
17 species that were observed and the dates in which
18 they were observed.

19 Q. But these are in -- no, wait, is that
20 correct?

21 These are in spring and fall of '08; is
22 that correct?

23 A. Yes.

24 Q. And it was my understanding looking at
25 this there was a bald eagle siting found in the

1 spring of '08.

2 A. Yes.

3 Q. If I could turn your attention to
4 Exhibit P. And very last page of that whole exhibit
5 at the end.

6 And this is from someone at the
7 Department of Natural Resources. No. 2 on the very
8 last page backside of that page talks about a
9 five-mile buffer zone on all existing bald eagle
10 nests.

11 A. Uh-huh.

12 Q. Any concern as to that buffer zone
13 knowing that at least there was one siting of a bald
14 eagle?

15 A. Well, this is in reference to bald eagle
16 nests. And we observed bald eagles migrating through
17 the project area.

18 Q. Okay.

19 A. We didn't document nests. In fact
20 there's very little if no nesting habitat within the
21 project area for eagles.

22 Q. But would you agree that they are, at
23 least the bald eagle is an endangered species as of
24 the time of this writing?

25 A. I would have to look back to see when

1 they were de-listed. I don't have that fresh in my
2 memory right now to know if they were removed from
3 the Endangered Species Act at the time that this
4 report was written.

5 Q. But do you agree that's what it says in
6 this document? That the bald eagle is protected by
7 the Endangered Species Act and it has been put in
8 Exhibit P of the application?

9 A. Well, I agree that this says that because
10 the bald eagle is an Endangered Species Act, a buffer
11 of five miles should be placed around nest sites.
12 And I would also --

13 Q. Thank you.

14 A. -- say that it's no longer on the
15 Endangered Species Act nor did we document nesting
16 sites in the project area.

17 Q. And this application, do you know when it
18 was filed?

19 A. I believe it was April of 2008. I'm
20 sorry, 2009.

21 Q. And you did your study in 2008; is that
22 correct?

23 A. That's correct.

24 Q. So at the time this was filed and at the
25 time you were doing your study were they on the

1 Endangered Species List?

2 A. As I said before, I'd have to look at the
3 exact date of de-listing. If you have that I could
4 tell you.

5 Q. I don't, that's why I'm asking you.

6 A. And I don't know.

7 Q. So I guess I'm thinking -- I'm wondering
8 why this was put into an application in April of 2009
9 but there wasn't any --

10 A. This is actually past correspondence and
11 I can tell you that the comments to this Derek
12 Kingstonberg, he stopped working at Woodlot
13 Alternatives I believe late in 2007 or early 2008.
14 So this is fairly old correspondence.

15 I'm sorry, Woodlot Alternatives was the
16 company prior to Stantec that I meant to say it's the
17 same company. He stopped working for our company at
18 that time.

19 MS. NAPIER: Thank you very much.

20 ALJ STENMAN: At this point let's take
21 just a quick five-minute break and come back at
22 11:15.

23 (Recess taken.)

24 ALJ STENMAN: Let's go back on the
25 record.

1 When we left off we were working our way
2 through the cross-examination of Ms. Meinke. Just to
3 note for the record during Ms. Napier's cross
4 Mr. Weithman representing the City of Urbana joined
5 us, and with that, Mr. Weithman, do you have any
6 cross?

7 MR. WEITHMAN: I do not, thank you.

8 ALJ STENMAN: Mr. Brown?

9 MR. BROWN: Yes.

10 - - -

11 CROSS-EXAMINATION

12 BY MR. BROWN:

13 Q. Good morning, Ms. Meinke.

14 A. Morning.

15 Q. I've got some questions -- I represent
16 the Urbana Country Club and I've got some questions
17 generally about matters and then I've got some
18 questions regarding the habitat around the Country
19 Club with regard to bats.

20 A. Okay.

21 Q. From your direct testimony it looks
22 pretty clear, and I think your responses to counsel
23 for the UNU were that bats are a general benefit to
24 the environment; is that true?

25 A. Yes.

1 Q. And from your direct testimony it looked
2 like one of the reasons they're a benefit to the
3 environment is that they eat a lot of insects or
4 pests; is that true?

5 A. Yep.

6 Q. Do they typically eat flying insects,
7 crawling insects, what kind of insects?

8 A. Typically flying.

9 Q. Flying insects?

10 A. Yes.

11 Q. Let's say, for example, just kind of
12 focusing in on Champaign County, what kind of flying
13 insects would you expect bats to eat in Champaign
14 County?

15 A. Beetles, moths, flies. All kinds of
16 flying insects.

17 Q. What kind of beetles? The kind that eat
18 leaves of trees or that crawl around on the ground or
19 what?

20 A. I can't answer specifically to what types
21 of beetles they might eat. I know there's a lot of
22 literature on the subject but I don't have any of
23 that in my knowledge base right now.

24 Q. Kind of generally is it good -- let's
25 say, do you have any outdoor interests, outdoor

1 recreational interests?

2 A. Many.

3 Q. What kind do you like to indulge yourself
4 in?

5 A. I like to back country ski, I like to
6 mountain bike, I like to road bike.

7 Q. So would you agree that bats near an
8 outdoor recreation area or facility would be a
9 positive?

10 A. I certainly think they are.

11 Q. And that would be because why?

12 A. Well, I particularly like bats and find
13 them very interesting, so I like to see them.

14 Q. All right.

15 A. I know a lot of people are afraid of them
16 and don't want them around too, but me personally, I
17 like to see them. So for me they're a benefit.

18 Q. Now, when you say people are sometimes
19 afraid of them but you also said that they really
20 only move around at night; is that right?

21 A. Yeah, I mean they come out when it's
22 still dusk. You can often see them emerging from
23 their roosts and it's getting dark but sometimes
24 they're fairly visible at dusk.

25 Q. But during the middle of the day would

1 you see bats flying around?

2 A. Not usually.

3 Q. But at night they eat a lot of insects,
4 would you agree with that?

5 A. Yes.

6 Q. And as an outdoor recreational person
7 like yourself when you are outside is it better not
8 to be stung or eaten up by mosquitoes, is that a
9 positive?

10 A. Yes.

11 Q. So would it be fair to say that having
12 bats around outdoor recreation facilities is a
13 positive because it at least reduces the number of
14 flying insects that you would otherwise have to
15 contend with?

16 A. Yeah, I would say that's true. I don't
17 know that they would reduce them to the level that
18 we're still not going to be -- that they're not going
19 to be a pest, but they certainly reduce the overall
20 number.

21 Q. So under the assumption that less flying,
22 stinging insects are better than more, would you say
23 that bats are good for an outdoor recreation facility
24 nearby?

25 A. From that standpoint, yes, probably.

1 Q. And then would you agree that -- well, do
2 you play golf?

3 A. No.

4 Q. Do you understand what golf is?

5 A. I have a general idea.

6 Q. Do you understand that golf involves
7 either driving a cart or walking through the outside
8 for might be four or five hours?

9 A. Yes.

10 Q. Do you understand the benefit of not
11 being stung or bitten by flying insects during that
12 period of time?

13 A. Yes.

14 Q. Next question is really regarding the
15 Buckeye Mist-Netting Report, if you wouldn't mind
16 pulling it out. I only have a couple of questions
17 about that, and that's part of the application,
18 right?

19 A. I believe it is.

20 Q. There's a figure 3.2 in the Buckeye
21 Mist-Netting Report. I'll help you out. I have to
22 put my computer on charge but I can help you by
23 getting --

24 A. Can you tell me which exhibit it is? Is
25 it X? Yes, it is.

1 Q. Let's see, the Mist-Netting Report is X.
2 And then within X there's the figure I'm talking
3 about, 3.2.

4 A. I have it.

5 Q. All right, it's right before the text on
6 page 15.

7 A. Okay.

8 Q. It looks to me like there are three
9 squares that are marked A1, A2, and A3. Can you
10 locate those?

11 A. Yes.

12 Q. Can you explain what those squares are
13 signifying?

14 A. They are roost locations for Northern
15 Myotis bat.

16 Q. So that means that -- is that a place
17 where you found bats in roosts?

18 A. That is correct.

19 Q. Can you tell me how many bats were found
20 in each of those three roosts? I think there's a
21 table on the next page.

22 A. Yep. It looks like there were 16, seven,
23 and 23.

24 Q. Does that mean that 16 bats were observed
25 in the one roost, seven were observed in the other,

1 and 23 were observed in another, or does that mean
2 they were actually captured?

3 A. No, that means they were observed
4 emerging from a particular tree in which a
5 radio-tracked bat had gone to to roost.

6 Q. So are you pretty confident that in this
7 area where A1, A2, and A3 are located on the map
8 isn't an area of bat activity?

9 A. Yes.

10 Q. And because it's produced in this report
11 as one of several places, can I assume that that's
12 one of the areas of greater bat activity in the
13 project area?

14 A. Not necessarily. It happens to be where
15 one of the radio-tagged bats that we captured went to
16 to roost.

17 Q. All right. But because you found what
18 appears to be at least 46 bats in that area, would
19 that be a significant bat activity area?

20 A. I don't know as I would call it
21 "significant." I would say it documents there were
22 definitely bats there using that area for maternity
23 roosts.

24 Q. And when you said -- could you say again
25 to me what kind of bats were caught or were observed

1 in this area?

2 A. They're Northern long-eared bats, *Myotis*
3 *Septentrionalis*.

4 Q. Is there anything particular about those
5 kind of bats in the way that they forage or travel or
6 roost?

7 A. As a *Myotis* bat they're similar as to
8 what we've been talking about for Indiana bats in
9 that they tend to travel near forested areas, stream
10 corridors, they use linear features of the landscape.

11 Q. And I understand from your direct
12 testimony that in some ways they do that out of
13 self-preservation, they try to stay away from
14 predators and so forth?

15 A. Yes.

16 Q. So it's a natural behavior for them to
17 kind of stay close to the treeline as they move
18 about?

19 A. That's the understanding.

20 Q. And then if you had several treelines
21 maybe let's say 50 yards apart, would it be common
22 for them to jump across that 50 yards expanse to
23 another tree, treeline?

24 A. Possibly, yeah.

25 Q. Is that too large? Because you said

1 before that they don't like to cross large expanses
2 of non-forested land. Is that too large to make that
3 jump?

4 A. So 50 yards would be about 150 feet
5 roughly?

6 Q. Just generally. How far would it be
7 before they would be -- when they would be concerned
8 about making that jump along the non-forested land?

9 A. It's really tough to answer. I don't
10 know that the studies have been done to accurately
11 answer that. From what I've read I don't -- 150 feet
12 from what I know of the literature would not be an
13 excessively large open area for them to cross.

14 Q. Now, next thing I'd like to do, keeping
15 in mind the map that you're looking at there, I'd
16 like to keep that in front of you because I want you
17 to compare it against another map that actually is on
18 the table.

19 We can bring it over. It's clipped, it's
20 part of the application and it's land cover map grid
21 C3. So there is an index of land cover maps in the
22 documents that support the application. It's right
23 on top. There's an index and within the index
24 there's blow-ups of that overall.

25 ALJ SEE: We need to know what

1 exhibit you found.

2 MR. PETRICOFF: Let's recite the figure
3 number for the record.

4 MR. BROWN: Figure 1-13.

5 ALJ SEE: Do we know that figure 1-13 was
6 provided in the maps that was provided to us this
7 morning?

8 MR. PETRICOFF: Yes.

9 BY MR. BROWN:

10 Q. What I'll say is figure 1 is the entire
11 project area and then it's broken down by rectangle
12 and this is grid C3 which is figure 1-13. All right?

13 So if we have to refer to the overall
14 project area in relation to grid C3, we can go back
15 to the first page of that cluster and we can see
16 where that fits into the whole project, all right?

17 A. Okay.

18 Q. So with regard to figure that we're
19 looking at, 1-13, do you see proposed turbine No. 48?

20 ALJ SEE: I'm sorry, for clarity of the
21 record I think this is figure 1-13.

22 Q. 1-13. 1-13 is the figure we're looking
23 at and on the upper left-hand corner which is near
24 the intersection of U.S. 36 and Ludlow, there is a
25 turbine No. 48. Do you see that?

1 A. I do.

2 Q. Now, can you tell me if that corner of
3 U.S. 36 and Ludlow, is that the same area where the
4 roost A1, A2, and A3 are located?

5 A. I'm just trying to find some landscape
6 features to orient myself with here.

7 Q. Yeah, you might -- if you see how -- on
8 that figure 3-2, that shows the roost locations.

9 A. Yes.

10 Q. You see how coming out of Urbana going to
11 the east one road continues to go east and one kind
12 of goes to the southeast?

13 A. Uh-huh.

14 Q. Well, one is 36 which continues on east,
15 and 29 goes to the southeast, all right?

16 A. Okay, yep.

17 Q. If you go all the way to where basically
18 the roost locations are shown, that is -- that
19 appears to be, from looking at the map, the corner of
20 where U.S. 36 and Ludlow to the south and A16 to the
21 north, right? A14?

22 ALJ STENMAN: Mr. Brown, I'm a little
23 unclear as to where Ludlow is. It may be that I'm
24 not from the area and not familiar, so if you could
25 just give us a little clarity. My guess is the

1 witness is having the same problem.

2 I found 36 and the other road but where
3 is Ludlow?

4 MR. BROWN: It's kind of difficult for
5 everybody because the map shows the roost locations
6 but doesn't really show any roads there, so that's
7 what I was asking her if she could confirm the
8 location of those roosts on a map that shows the
9 turbines.

10 A. The feature that goes from the northwest
11 to the southeast that cuts right through the roost,
12 is that a railroad line or is that a road? I think
13 it's a road. If you could tell me where that is on
14 this larger map, that would help me.

15 Q. All right.

16 (Off the record.)

17 Q. Let me back up.

18 Did you take part in preparing this
19 figure 3.2?

20 A. I prepared it.

21 Q. And so the base map, the one without the
22 bubbles on it, that was used to give kind of a
23 general location of the roost; is that right?

24 A. Yes.

25 Q. So maybe from -- because this map is not

1 marked particularly well we're not going to be able
2 to determine exactly where those roosts are, but can
3 we at least agree that they're nearby in that area on
4 the upper left-hand corner of figure 1-13?

5 A. I think that's fair to assume that
6 they're somewhere nearby.

7 Q. All right. So if you look at that figure
8 1-13, do you notice the location of turbine 48?

9 A. Yes.

10 Q. And do you see how the location of
11 turbine 48 appears to be right on the corner of a
12 forested area? Do you see that?

13 A. I do.

14 Q. And then do you see to the east of 48 and
15 a little bit to the north there's another forested
16 area?

17 A. I do.

18 Q. And then just to the north of that and
19 back to the west close to the Country Club there's
20 another forested area?

21 A. Yes.

22 Q. So there appears to be three clusters of
23 forest areas fairly near turbine 48. Would you agree
24 with that?

25 A. Yes.

1 Q. And if you look at the map, can you see
2 the Country Club, do you see what looks like -- they
3 call them golf links because they're little golf
4 holes with a tee and a fairway and a green.

5 Can you see that on the map? It's south
6 of the checkered red and white line?

7 A. Yes.

8 Q. And east of the checkered red and white
9 line --

10 A. Yes, I see.

11 Q. -- that is the golf course. Do you see
12 it's kind of a different green than the rest?

13 A. Yes.

14 Q. So will you agree that there are three
15 clusters of wooded areas just to the southwest of the
16 golf course?

17 A. Yes.

18 Q. And do you also see a couple of clustered
19 areas of trees within the eastern part of the golf
20 course?

21 A. Yes.

22 Q. So basically we've got three clusters of
23 trees and we've got some tree clusters in the golf
24 course as well, right?

25 A. Yes.

1 Q. So that's just a baseline.

2 Now, so we've got turbine 48 which is
3 proposed to be located very close to the golf course
4 and there will be evidence -- well, if you look at
5 the map and the legend, I think it shows that turbine
6 48 is approximately .4 miles from the closest point
7 to the golf course.

8 But just assuming that, you don't have to
9 confirm that because it's not important, but we've
10 got a close nearby golf course and three established
11 stands of trees plus trees on the golf course, that's
12 all I'm trying to say.

13 A. Okay.

14 Q. You agree with that?

15 A. Uh-huh.

16 Q. My next question is how far should a
17 turbine be located from a bat roosting or feeding
18 area?

19 A. Well, it really depends on a lot of
20 things. It depends on the type of bat, it depends on
21 their unique foraging behavior, their roosting
22 behavior, the types of habitat that they prefer to
23 roost in.

24 So I don't think I could give you a set
25 distance that would be appropriate for all bats.

1 Q. Let's not talk about all bats. We've got
2 40 particular bats -- actually we've got 50 that --
3 we've got 46 particular bats I want to talk about.
4 The 46 that were observed coming out of roost A1, A2,
5 and A3. Let's just focus on those bats.

6 A. Uh-huh.

7 Q. If you were in charge of making sure that
8 those bats were protected and survive, would location
9 48 be a good location for a turbine?

10 A. Again, it's difficult to say. We're
11 talking about Northern bats, Northern long-eared
12 bats.

13 Q. The ones who were observed at this
14 location, let's just focus on those.

15 A. Right.

16 Q. Yeah.

17 A. So what I can tell you about those
18 particular bats are that they have -- the studies
19 have been done on Myotis bats in general is that they
20 tend to fly lower to the ground than say the Lasiurus
21 bats I referred to earlier, the long distance
22 migrants.

23 As a result they are the bats that are
24 least frequently found in post-construction mortality
25 surveys at wind turbine sites.

1 The assumption is likely that their
2 foraging behavior, their migratory behavior, makes
3 them lower risk species for collisions with turbines.

4 So when you asked me what's the
5 appropriate distance, you have to take into
6 consideration their average flight heights, the types
7 of migratory movements that they makes.

8 So there really isn't a simple answer to
9 your question

10 Q. Let's not be concerned about whether or
11 not they actually get -- are struck by the turbine
12 during their foraging or migration or anything. But
13 let's just say that there's a bat colony in one of
14 these forests. And especially if it's in that
15 southwestern forest which is right next to turbine
16 48.

17 Now, would the bats be smart enough to
18 know let's not roost in that forest because that big
19 turbine is turning right there?

20 A. I can't answer that question.

21 Q. Would they -- would there be something
22 about the operation of the turbine that would make it
23 less likely for them to roost in that woods?

24 A. It's possible that they -- that that
25 would make it less attractive to them. That they

1 might be displaced by that turbine.

2 Q. Because they would choose not to roost
3 there because of that turbine being close by?

4 A. It's possible. I don't have any studies
5 that I can point you to to document that, but.

6 Q. Are they perceptive enough to know that
7 okay, I'm going to still stay here even though that
8 thing's turning around there but I'm not going to
9 forage around here because I might lose my way and
10 might get hit by that thing, I'm going to go further
11 away to do my foraging, is that possible?

12 A. It is possible.

13 Q. All right. So if, just hypothetically if
14 the turbine's there and these particular bats, these
15 46 that we know are there decided, you know, the risk
16 threshold is increased for me, I'm going to go
17 somewhere else, that would be a bad thing for the
18 Country Club, right?

19 A. From the standpoint that we talked about
20 earlier, yes.

21 Q. Because they wouldn't be around to eat
22 the bugs at night and the bugs would be there the
23 next day when the golfers are playing golf, right?

24 A. Or the people who like seeing bats, they
25 would no longer have the privilege of seeing the

1 bats, yes.

2 Q. And so it seems to me there are three
3 circumstances that the turbines spinning might cause:
4 One is they might be killed by it; two, they might
5 decide that this isn't a very good place to live; and
6 three, maybe we'll still live here but we won't hunt
7 around here, we'll hunt somewhere else so we can stay
8 away from that, all three of which I believe would be
9 bad for the golf course; is that right?

10 A. Yes.

11 Q. Do bats recognize the change in pressure
12 that you talked about before that sometimes causes
13 their lungs to collapse?

14 A. The nature that we were talking about it
15 before, no, I don't know they're anticipating the
16 change in pressure which is why they -- they're
17 killed by it.

18 Q. So sometimes they might fly into it and
19 they're so far in it collapses their lungs and they
20 die.

21 A. Correct.

22 Q. Or they die sometime later. But do they
23 sometimes get close enough where it feels
24 uncomfortable and they say whoa, I don't like that, I
25 don't want to go close to that anymore, and they just

1 move away?

2 A. I could say that that was a fair
3 assumption but I have no data to support that.

4 Q. Do you know anything about the operation
5 of the wind turbine that may attract bats to it?

6 A. There have been some studies that have
7 been done that have indicated that that might be the
8 case for certain species.

9 Q. So how about this species, do you know?

10 A. Not the Northern Myotis in particular,
11 no.

12 Q. I mean is it kind of a phenomena like you
13 see mosquitoes or moths go to a bright light, is
14 there something in their brain that causes them to go
15 toward the wind turbine?

16 A. Well, the studies that have been done are
17 mostly related to the long distance migrant bats that
18 I've referred to earlier for silver-haired bats, red
19 bats, eastern red bats.

20 There's some indication that they are
21 attracted to the turbines because they're the tallest
22 features on the landscape, that it might be part of
23 their reproductive mating ritual.

24 There's a lot of conjecture at this point
25 but there's a lot of ideas as to why that particular

1 group of bats may encounter turbines more frequently.

2 Q. And just so that I understand, is this
3 the kind of bat, "blind as a bat," is that, I mean
4 they can't see the turbine but can they sense it some
5 way?

6 A. They echo locate, yes. So one would
7 expect them to be able to detect the turbine in most
8 cases. There's some thought that when they're
9 migrating they're not echo locating actively or in
10 some cases they may be attractive.

11 Q. So they're not attracted by the site of
12 them but they may be attracted by this echo location
13 system that they have.

14 A. There's some indication that they may be
15 attracted to the sight of them. Because they --

16 Q. They actually see?

17 A. Bats do see.

18 Q. They do, okay.

19 Are they potentially attracted to the
20 sound?

21 A. There really isn't conclusive evidence of
22 that.

23 Q. Are bugs attracted to the turbines for
24 any reason?

25 A. Not that I'm aware of.

1 Q. My question obviously is if bugs were
2 attracted to the turbine, then obviously the
3 predator's going right where the prey is, right?

4 A. Yeah.

5 Q. So no studies on --

6 A. Not that I'm aware of.

7 Q. Now I guess the last question I have is
8 do bats have memories?

9 A. I would imagine they do.

10 Q. So let's say a bat is out foraging one
11 night and the turbine's not running, it's just
12 sitting stagnant. Would that register in their brain
13 pretty much where that thing is sitting?

14 A. I would imagine they are familiar with,
15 intimately familiar with what is in their normal home
16 range, yes.

17 Q. Would that be a totally different
18 obstacle to avoid if the turbine was spinning as
19 opposed to it being stationary?

20 A. Yeah.

21 Q. So would that make it more difficult for
22 them to survive while foraging in that area where a
23 turbine is turning?

24 A. Possibly.

25 Q. Do you believe -- I talked a little bit

1 before about bats and how they affect outdoor
2 recreation facilities and I just want to make sure
3 that I'm not too focused on that.

4 If bats are good for outdoor recreation
5 facilities like a golf course or a park or whatever,
6 would you agree that that would be true about
7 somebody who's sitting out on their back patio?

8 A. Yes.

9 Q. Bats would be good because they would
10 kill insects.

11 A. Yep.

12 MR. BROWN: That's all I have.

13 ALJ SEE: Ms. Flahive?

14 MS. FLAHIVE: I have no questions.

15 ALJ STENMAN: Staff.

16 - - -

17 CROSS-EXAMINATION

18 BY MS. GRASSESCHI:

19 Q. I'm Christina Grasseschi and I'm with the
20 staff. I'll be asking you questions on behalf of the
21 staff today.

22 A. Okay.

23 Q. It has been established through your
24 testimony that one possible plan --

25 ALJ STENMAN: Could we get you to use a

1 microphone? I'm having a hard time.

2 MS. GRASSESCHI: Yes, sorry.

3 Q. It has been established through your
4 testimony that one possible approach to mitigate
5 potential impacts to the Indiana bat would be to
6 establish a habitat conservation plan, correct?

7 A. Correct.

8 Q. And if you could describe for me what the
9 basic steps are in establishing such a plan.

10 A. The basic steps are to identify the
11 project actions and then to establish what the likely
12 impacts are to Indiana bats based on site specific
13 information and what's known in the literature, past
14 studies that have been done, working with the Fish &
15 Wildlife Service and ODNR to establish the likely
16 impacts.

17 So we would come up with an estimate of
18 take and usually that's derived by different modeling
19 procedures, habitat suitability models, collision
20 risk models, and all those things are using best
21 available science to put together an estimate of the
22 number of bats that are likely to be killed. Or
23 adversely affected by the wind power project.

24 And then another key component to that is
25 the avoidance minimization and mitigation steps that

1 are going to be taken to address that level of take.

2 And I think I talked about potential
3 conservation measures earlier. Those would be
4 included and potentially others that are collectively
5 determined by Fish & Wildlife, ODNR, and ourselves.

6 And then the Fish & Wildlife Service
7 would then issue a biological opinion stating whether
8 or not the level of take was likely to jeopardize the
9 continued existence of the species.

10 And if the answer to that is no given all
11 of the avoidance minimization and mitigation measures
12 that have been agreed to in the habitat conservation
13 plan, then they would issue what is called an
14 incidental take permit that allows the applicant to
15 take or kill or displace or adversely affect that
16 given number of Indiana bats within a set period of
17 time that's defined in the HCP.

18 Q. So all those things you just mentioned
19 were all part of an HCP or are those what you like --
20 I think you mentioned the biological opinion. Is
21 that something that you do in addition to an HCP or
22 is that part of the HCP?

23 A. That's part of the HCP process. That's
24 something that's issued by the Fish & Wildlife
25 Service and authored by them.

1 So that would be in response to the
2 habitat conservation plan document that would be
3 produced by the applicant.

4 Q. And can you give me a timeline of how
5 long it takes to go through each step and have a
6 completed HCP?

7 A. The approximate timeline for developing
8 the document is probably anywhere between two and
9 five months. The issuance of a biological opinion
10 probably, I don't know, one to two months, something
11 along those lines.

12 Another component of the section 10
13 process, which is sort of parallel to but not
14 directly a part of the HCP, is compliance with NEPA,
15 National Environmental Policy Act.

16 So in addition to the approval of the HCP
17 and the issuance of the biological opinion by Fish &
18 Wildlife, the applicant would also have to comply
19 with NEPA because it's the act of the Fish & Wildlife
20 Service issuing a take permit as a federal action.

21 Therefore, it would have to comply with
22 NEPA and that would be also a process that would need
23 to be approved. So the NEPA process, if an
24 environmental assessment needs to be completed as
25 part of that, the general review time for that is 60

1 days.

2 If an environmental impact assessment is
3 required, it's a 90-day period including the public
4 comment review.

5 Q. The public comment, that review you just
6 referred to, is that part of the process that you've
7 already submitted for in your answer to question 15
8 in your direct testimony?

9 If you want to refer to it, you can. You
10 state in the first sentence that "Stantec has begun
11 the preparation of the HCP document."

12 And then in your last sentence you state
13 that "The Applicant has also prepared and submitted
14 to the U.S. Fish & Wildlife Service a scoping
15 document for publication in the Federal Register that
16 describes the Applicant's intent to prepare an HCP
17 and solicits comments from the public on the
18 Applicant's proposed actions."

19 A. Yeah, that's what's called a scoping
20 process. So that is separate from the public comment
21 period on the HCP document and the NEPA document
22 themselves.

23 Q. Is there a hearing process that's
24 involved with either of those public hearings -- or
25 the -- if public comments are solicited and received,

1 is there a hearing process involved with either of
2 those?

3 A. To my understanding there isn't a formal
4 hearing process. It's an iterative process in which
5 the Fish & Wildlife addresses those public concerns
6 and works with the applicant to potentially modify
7 the documents, if need be.

8 Q. I'm sorry, you might have just mentioned
9 this but I'm going to ask for clarification.

10 ALJ STENMAN: Ms. Grasseschi, can I get
11 you to speak up a little bit or put the microphone
12 closer, I think we're still having a little trouble
13 over here.

14 MS. GRASSESCHI: Sorry.

15 Q. You had indicated before too that because
16 Indiana bats were located within the five-mile buffer
17 zone, the applicant would need to undergo a formal
18 process of consultation with the Fish & Wildlife
19 Service, which could include obtaining an incidental
20 take permit through such intent of the Endangered
21 Species Act, correct?

22 A. Correct.

23 Q. And I'm curious to know how long that
24 process takes. To obtain that permit.

25 A. Yeah, so I think I did sort of answer it

1 but in pieces. I mean I think probably a year long
2 process is reasonable, six months to a year.

3 Q. And back to the habitat conservation
4 plan, I'm assuming that because you have already
5 begun the preparation of that the applicant is still
6 pursuing that option; is that correct, to your
7 knowledge?

8 A. That's my understanding, yes.

9 Q. Have you begun the process of obtaining
10 an incidental take permit or has the applicant begun
11 that process?

12 A. Not in the sense that on -- in order to
13 apply for an ITP one has to develop an HCP document
14 and submit it to the Fish & Wildlife Service.

15 So from the standpoint that we've begun
16 formal consultation and made it public that our
17 intent is to go through this process, we've started
18 the process of applying for a take permit. But until
19 the document is submitted to Fish & Wildlife, we will
20 not actually apply for permit.

21 Q. So would it be fair to say that the
22 year-long process of obtaining an ITP would be in
23 addition to however long it takes to get an HCP?

24 A. No, that's included.

25 Q. Okay.

1 A. That's the final process to the take
2 permit being issued.

3 Q. And you referenced some other processes
4 such as section 7 of the Endangered Species Act.
5 That wouldn't result in a permit, would it?

6 A. It's not an incidental take permit. It's
7 an incidental take statement. So it's the same,
8 roughly the same process.

9 It's slightly different in that whatever
10 federal entity other than the Fish & Wildlife Service
11 is the action agency, they would be responsible for
12 compliance with NEPA and section 7.

13 And so the biological opinion that's
14 written by Fish & Wildlife would include an
15 incidental take estimate which would also have an
16 identified level of take for Indiana bats that's
17 legally allowable under section 7.

18 Q. And is an HCP prerequisite to that as
19 well?

20 A. No, they're two different processes for
21 addressing the same issue and coming up with
22 essentially the same outcome.

23 Q. And to your knowledge has the applicant
24 begun the process of a section 7 determination?

25 A. Well, they -- it's a little confusing

1 because under section 10 there is an aspect of
2 section 7 that needs to be addressed and that would
3 all be within the time frame that I described to you.

4 If there were a federal permit needed for
5 this project by an agency that agreed that it was
6 their jurisdiction to oversee impacts, operation at
7 impacts on turbines, then a section 7 process would
8 be carried out instead of a section 10 process. So
9 it's not in addition to, it's one or the other.

10 Q. Do you have any knowledge or indication
11 of which process the applicant is expecting to take?

12 A. It's my understanding that there is no
13 federal nexus in this application and that they will
14 be going the section 10 route.

15 Q. One final question.

16 Again with regard to your answer to
17 question 15 in the scoping document that was
18 submitted in to the Federal Register, has that
19 appeared in the Federal Register yet to your
20 knowledge?

21 A. It hasn't yet. I believe it's currently
22 being finalized, and as I understand it, the process
23 can take up to a month to be published in the
24 Register. Then I think it's a 30-day public review
25 period.

1 MS. GRASSESCHI: Thank you, that's all my
2 questions. Thank you.

3 ALJ STENMAN: Thank you.
4 Any redirect?

5 MR. PETRICOFF: No, your Honor. But I do
6 want to correct one thing on the record during cross,
7 didn't want to take up the time on the cross.

8 There's a couple references to Ms. Meinke
9 as to her company. I just want to make the record
10 clear she does not work for Buckeye Wind, she works
11 for Stantec, the consultant that's retained by
12 Buckeye Wind.

13 Thank you.

14 ALJ STENMAN: I think, Ms. Meinke, then
15 you're finished.

16 THE WITNESS: Thank you.

17 ALJ STENMAN: Do we have some exhibits to
18 deal with?

19 MR. PETRICOFF: Yes, your Honor. At this
20 point we would like to move for admission of Buckeye
21 Exhibit No. 7.

22 ALJ STENMAN: Any objections?

23 MR. VAN KLEY: No, your Honor.

24 ALJ STENMAN: Buckeye Exhibit No. 7 will
25 be admitted.

1 (Exhibit admitted.)

2 ALJ STENMAN: Union Neighbors United.

3 MR. VAN KLEY: Thank you, your Honor.

4 With regard to Exhibit 53, I've had a
5 conversation with applicant's counsel. I indicated
6 when I questioned the witness about it that it is
7 part 1 of an overall larger document.

8 For purposes of saving paper we did not
9 include the rest of it which is not pertinent to the
10 questions that were asked.

11 And I believe that they've stated they're
12 going to look at the whole document and do the same
13 thing as they did for the other Exhibit 45 last night
14 as to whether they have an objection to that. So
15 subject to that we'll move its admission when they
16 check it.

17 ALJ STENMAN: Okay.

18 MR. VAN KLEY: And we would move into
19 admission Exhibit 54 at this time.

20 ALJ STENMAN: Any objections?

21 MR. PETRICOFF: No, your Honor.

22 ALJ STENMAN: UNU Exhibit 54 will be
23 admitted.

24 (Exhibit admitted.)

25 ALJ STENMAN: Let's go off the record.

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(Off the record.)

(Lunch recess taken.)

- - -

1 Thursday Afternoon Session,
2 November 12, 2009.

3 - - -

4 ALJ STENMAN: Let's go back on the
5 record.

6 This morning before we got started we
7 dealt with a couple of pending motions. I know we
8 have another motion on behalf of Buckeye which was a
9 motion to strike the testimony of Mr. Skillman. I
10 think we've already heard Buckeye on that issue.

11 Mr. Weithman, do you have anything?

12 MR. WEITHMAN: I didn't hear what they
13 had to say, I wasn't in attendance at the time, but
14 what I would say is Ms. Saia asked me to send her
15 some stuff and I did showing that I did send those.

16 I sent those out on the same day as I had
17 somebody bring them down here which was the day that
18 they were due. I believe they were sent out really
19 close to 5:00 o'clock, but that was the soonest we
20 could get them from our consultant. They were sent
21 out.

22 I've talked to several other of the
23 intervenors and they got them the same day they were
24 sent out. I can't explain why they're claiming they
25 didn't get theirs today day because I sent theirs out

1 at the same time.

2 ALJ STENMAN: Do you have a response?

3 MR. PETRICOFF: Yes, your Honor.

4 I think the problem here was that the
5 filing date from docketing is fairly clear. It's a
6 couple days off. The other testimony was filed on
7 time. The rules are the rules.

8 ALJ STENMAN: Does anyone else have
9 anything on that particular issue?

10 MR. SELVAGGIO: Yes, Judge, can I be
11 heard?

12 ALJ STENMAN: Sure.

13 MR. SELVAGGIO: Number one, the County
14 would respectfully submit that no party is prejudiced
15 by having the documents whether they be on time or a
16 day or two past the filing deadline.

17 Number two, we would submit to the Court
18 that this is a unique project. The first one in the
19 state of Ohio. This is the first time that the
20 Siting Board has had to deal with issues like this.

21 And that for the public, particularly the
22 citizens of Champaign County, to have confidence in
23 the outcome of this proceeding, the citizens want to
24 know that the Board has examined all of the issues
25 and have thoroughly and competently been made to

1 understand what points of view are involved.

2 And any time that this -- that the Board
3 or the Court restricts the flow of information, we
4 would respectfully submit that it inhibits the
5 decision-making process because of the uniqueness
6 that this is the initial hearing on this type of
7 application.

8 And we think that there's an overriding
9 public interest that everybody's information, whether
10 it be the applicant's information or an intervenor's
11 information, is presented and examined by the Hearing
12 Officers and by the Board.

13 And on behalf of our clients we don't
14 like to see the restriction of information or the
15 restriction of exhibits or the restriction of
16 testimony because in the end, the citizens are going
17 to be living with the outcome and the citizens have
18 to have public confidence in that decision-making
19 process.

20 ALJ STENMAN: In considering everybody's
21 arguments, the Bench is aware that it seems that all
22 the parties were electronically served on November
23 the 2nd prior to I think was probably about 4:45
24 everybody was served, maybe a little bit earlier.

25 So in light of that fact that no one

1 appears to have been prejudiced by the omission of
2 the actual docketing of the testimony, we'll allow
3 the City of Urbana to call the witness later in the
4 proceedings.

5 I don't think we have anything else
6 before Buckeye calls their next witness.

7 Go ahead.

8 MR. SETTINERI: Your Honors, we'd like to
9 call David M. Hessler to the stand.

10 ALJ STENMAN: Please raise your right
11 hand.

12 (Witness sworn.)

13 ALJ STENMAN: All right.

14 - - -

15 DAVID M. HESSLER
16 being first duly sworn, as prescribed by law, was
17 examined and testified as follows:

18 DIRECT EXAMINATION

19 BY MR. SETTINERI:

20 Q. Please state your name and business
21 address for the record please.

22 A. My name is David Hessler. I work for
23 Hessler Associates, Inc. The address is 3862 Clifton
24 Manor Place, Heymarket, Virginia.

25 MR. SETTINERI: At this time, your

1 Honors, we'd like to mark as Buckeye Exhibit No. 8
2 the direct testimony of David M. Hessler.

3 ALJ STENMAN: So marked.

4 (Exhibit marked.)

5 Q. Mr. Hessler, do you have a copy in front
6 of you what has been marked as Buckeye Exhibit 8?

7 A. Yes, I do.

8 Q. Could you please identify that for me?

9 A. It's my direct testimony.

10 Q. Do you have any revisions or amendments
11 to that testimony at this time you'd like to make?

12 A. Yes, I do. Just two very minor
13 corrections. The first one is on page 5, the last
14 sentence of the bottom complete paragraph there where
15 it starts "when audible."

16 The change should say "when audible"
17 comma. The rest of it's fine.

18 And then the other change is on page 9,
19 the very top first sentence. Right now it says
20 "because there is no low." It should say "because
21 there is no significant low."

22 Q. Mr. Hessler, if I were to ask you the
23 same questions in your testimony as revised -- strike
24 that.

25 Mr. Hessler, if I was to ask you the same

1 questions in your testimony, would your answers be
2 the same as set forth in your testimony as you just
3 revised?

4 A. Yes.

5 MS. NAPIER: I can't hear.

6 MR. SETTINERI: Your Honors, the witness
7 is available for cross-examination.

8 ALJ STENMAN: Union Neighbors United?

9 MR. VAN KLEY: Thank you, your Honor.

10 - - -

11 CROSS-EXAMINATION

12 BY MR. VAN KLEY:

13 Q. Good afternoon Mr. Hessler.

14 A. Good afternoon.

15 Q. I thought we would start your
16 cross-examination by getting out of the way a few
17 preliminaries that will help us better understand
18 your testimony.

19 Why don't we just start off by asking you
20 a few questions about your firm. Your firm's called
21 Hessler Associates?

22 A. That's right.

23 Q. And Hessler Associates was formed by your
24 father, George Hessler; is that right?

25 A. That's correct.

1 Q. And how many acoustical engineers are in
2 the company?

3 A. Just him and I.

4 Q. So essentially you and your dad are
5 Hessler Associates?

6 A. And also my younger brother helps us.

7 Q. Is he also an acoustical engineer?

8 A. No, he's just a technician.

9 Q. Next I thought we would provide all of us
10 here with some definitions of some terms that we're
11 going to use in your discussion today.

12 I thought I would just get those all out
13 of the way upfront and we wouldn't interrupt the flow
14 of the question when we get into the good stuff.

15 A. Sounds like a plan.

16 Q. The first definition I wanted to throw
17 out is for dB(A), which stands for decibel
18 A-weighted; is that right?

19 A. Yes.

20 Q. And can you explain what A-weighted
21 decibels are?

22 A. Yeah, A-weighting serves a very critical
23 function in sound measurements in that it makes an
24 adjustment to the frequency spectrum so that the
25 sound matches the way the human ear actually

1 perceives the sound.

2 When you measure something with a meter,
3 you'll measure the magnitude of the sound across the
4 frequency spectrum, and but if you just use that
5 direct measurement without any weighting, the
6 measurement would have very little correlation to the
7 way things sound.

8 So A-weighting was developed quite some
9 time ago to make an adjustment so that the sound is
10 more meaningful.

11 Q. The next definition is for dB(C), which
12 stands for C-weighted decibels; is that correct?

13 A. That's correct.

14 Q. Explain that please.

15 A. That's a very similar concept, although
16 the weighting factors are -- or the adjustments made
17 to the original spectrum are very small.

18 So a C-weighted level is essentially
19 similar to the -- or, the value of it is essentially
20 as an instrument would measure it. And the purpose
21 of C-weighting is to -- it's usually used when
22 sources are very rich in low frequency noise, in
23 particular gas turbines. That's the most common use
24 for C-weighting.

25 Q. So dB(C) weighting or C-weighting allows

1 you to have a visual as to how much low frequency
2 noise is in your spectrum; is that right?

3 A. Yeah. The idea behind it is it's very
4 sensitive to the low frequency content of a sound.
5 Whereas A-weighting is not because the human ear is
6 not sensitive to low frequencies.

7 Q. And when you do A-weighting of sound, you
8 can't see how much of what you're measuring is
9 actually low frequency; is that right?

10 A. You can see it but the values are much
11 lower.

12 Q. Isn't it true that the low frequency
13 sound is filtered out by dB(A) weighting?

14 A. It's not filtered out, it's just adjusted
15 so that the frequency spectrum corresponds to the way
16 you would actually perceive the sound.

17 Q. Well, it actually eliminates some of the
18 low frequency sound from the ultimate number you get
19 from A-weighting, doesn't it?

20 A. I'm not sure I understand that question.
21 Could you repeat that?

22 Q. Sure. Isn't it true that A-weighting of
23 sound eliminates from the number you get from
24 measuring the sound some of the low frequency noise?

25 A. A-weighted levels in general are always

1 substantially lower than C-weighted levels. And I'm
2 talking about the overall magnitude on the spectrum.

3 A-weighted spectrum is usually a much
4 lower value than a C-weighted level. And it's
5 because that to get the overall dB(A) level or dB(C)
6 level, the frequency is logarithmically summed up to
7 get to add up to one single number that represents
8 the spectrum.

9 And because A-weighting takes away some
10 of the low frequency content, an A-weighted level is
11 almost always significantly lower than C-weighted.

12 Q. But just because you measure some sound
13 in dB(A), it doesn't necessarily follow that there is
14 no C-weighted sound in that particular sound that
15 you're measuring, right?

16 The C sound is still it even though
17 you're measuring it in dB(A)?

18 A. Exactly, the sound is the same. It's
19 just a way of expressing the frequency spectrum so
20 that it's either almost unadjusted or adjusted to the
21 way it really sounds to be. That's all.

22 Q. Let's go on to the next exciting
23 definition, L90. L90 is a way for acoustic engineers
24 to evaluate sound levels; is that right?

25 A. Yes, it is.

1 Q. And is it true that at least some of the
2 instrumentation that you use to measure sound will
3 measure that sound in ten-minute increments?

4 A. Yeah. Yeah, sound can be measured in any
5 time increment.

6 Q. And when do you an L-weighted or -- is it
7 typical that the instrumentation that you use samples
8 sounds somewhere between 10 and 50 times per second?

9 A. I'm not sure of the exact sampling rate
10 but it's very rapid like that.

11 Q. When you take all the results of those
12 samples, then you establish a level at which
13 90 percent of those samples are higher and 10 percent
14 of the samples are lower; is that correct?

15 A. That's correct, yeah. Over some time
16 interval.

17 Q. And that's your L90.

18 A. Right.

19 Q. And when you see a reference to an LA90,
20 that means you're expressing the results in
21 A-weighting.

22 A. Yes, it does.

23 Q. Okay. Now, is it true that the purpose
24 of an L90 method for evaluating your sound
25 measurements is to show what the sound level is

1 during the quiet times that you're measuring?

2 A. Exactly. For example, over a ten-minute
3 period you might have cars going by or planes flying
4 over, and what you're seeking to quantify with the
5 L90 is what is the sound in the absence of any of
6 those events.

7 And the quiet lulls between when the wind
8 blows, the quietest time, and it may well not be
9 consecutive, it might be just a few seconds here and
10 a few seconds later adding up over a ten-minute
11 period to one total minute.

12 Q. And the reason that you want to know the
13 level at which 90 percent of the sound is higher is
14 because you want to determine whether sounds during
15 the quieter time might cause annoyance or sleep
16 disturbance or some other effect on the receptor; is
17 that correct?

18 A. No, not really. The typical purpose for
19 measuring L90 is to establish what background level
20 is consistently present and available to potentially
21 mask the noise from a new installation.

22 Q. With the premise being that if new noise
23 that's coming into the area occurs during that ten
24 percent of the time under the L09 number, it would be
25 noticeable.

1 A. I'm not sure I understand the logic of
2 that question, but the purpose is to establish the
3 near minimum level that's there to potentially
4 obscure a new project, as I mentioned.

5 You don't want to use, for instance, the
6 sound level when a car is passing by because that's
7 not always going to there be to serve the purpose of
8 obscuring the project.

9 Q. And in fact if you included the sound
10 from an intermittent car going by, you would greatly
11 skew the results of your measurements, wouldn't you?

12 A. Right. You would come up with a higher
13 level.

14 Q. The next term is Leq. That's another way
15 of statistically organizing the numbers you get from
16 your sound measurements, correct?

17 A. That's right.

18 Q. And in Leq you take an average of the
19 sound measurements.

20 A. Yeah, that standard for the equivalent
21 energy sound level but in simple terms it's the
22 average over some measurement period.

23 Q. And simply here when you have a figure
24 Leq, that means you're averaging A-weighted sound.

25 A. That is correct.

1 Q. The next term is ANSI, A-N-S-I. That
2 stands for American National Standards Institute?

3 A. Correct.

4 Q. And ANSI provides standards for measuring
5 sound that are generally accepted practices for
6 acoustical engineering?

7 A. Yes. There's many standards.

8 Q. And these standards are the product of
9 working groups of respected acoustical engineers; is
10 that correct?

11 A. Usually, yes.

12 Q. Once these working groups prepare or
13 write these standards, then they are also approved
14 after review by committee of acoustic engineers; is
15 that correct?

16 A. That's correct.

17 Q. And then that committee approves the
18 standards for general use; is that right?

19 A. Yes.

20 Q. Do you know who Paul Shomer is?

21 A. Yes, I do.

22 Q. Do you recognize Paul Shomer as an
23 authority in acoustic engineering?

24 A. Yes, he's a well-respected member of the
25 community.

1 Q. He was or he is the chairman of
2 Acoustical Society of American Standards Committee;
3 is that right?

4 A. I believe so.

5 Q. And he's been involved in establishing
6 many of the acoustic standards?

7 A. Yes, that's my understanding.

8 Q. The next and last term, you'll be happy
9 to hear that is the last term, is ISO. Stands for
10 International Standards Organization?

11 A. That's correct.

12 Q. And that is a group of acoustical experts
13 who are -- that is a group of experts who are the
14 European equivalent to ANSI.

15 A. Yeah, it's very comparable. They're
16 almost interchangeable.

17 Q. And they also have standards that are
18 respected and used even in the United States, right?

19 A. Yes.

20 Q. Now that we've gotten that out of the
21 way, I think everybody can tell why we wanted to get
22 those out of the way rather than interrupting the
23 flow of what matters in this case.

24 Why don't we talk about the issues in
25 this case.

1 Can you tell me how many homes are
2 located within a half mile of a turbine in the
3 Buckeye Wind farm as currently designed?

4 A. I don't know but it's a fairly sizeable
5 number.

6 Q. Would you say hundreds?

7 A. That sounds a bit high. I suppose it's
8 possible.

9 Q. Do you know how many homes are located
10 within a mile of the Buckeye Wind Project?

11 A. It would be a lot.

12 Q. Even more, right?

13 A. Even more.

14 Q. Would it surprise you to learn that
15 according to Buckeye Wind's interrogatory answer
16 that's admitted into evidence in this case that there
17 are 1,004 homes and one church located within one
18 kilometer of a proposed turbine in this project?

19 A. That sounds right to me.

20 Q. Would it surprise you to learn that
21 according to the same Buckeye Wind interrogatory
22 answer there are 2,087 homes and other structures
23 located within 1.7 kilometers of a proposed turbine
24 in this project?

25 A. Doesn't surprise me.

1 Q. 1.7 kilometers is just over a mile,
2 right?

3 A. That sounds about right.

4 Q. Is it reasonable to assume that each one
5 of these homes has an average of four people living
6 in it?

7 A. I have no idea on that.

8 Q. Did you know about all of these homes and
9 structures that are located in these areas when you
10 were modeling the noise predicted to come from these
11 turbines?

12 A. Yes, because we had to indicate them on
13 our sound maps.

14 Q. Let's talk about the background noise
15 study that you did to prepare for the work that you
16 did for Buckeye Wind with regard to noise.

17 Now, background noise study is a means of
18 learning what the typical noise in the community is
19 before a new project such as a wind farm comes into
20 that community, right?

21 A. Correct.

22 Q. And you use the information from that
23 background noise study to determine how noisy the
24 community is before this new source arrives.

25 A. Right. That's the same thing you just

1 said.

2 Q. And the reason you do that is so that you
3 can compare that background noise to the anticipated
4 noise that will come from the new source.

5 A. Correct.

6 Q. So in this case you measured the
7 background noise so that you could compare it to the
8 anticipated noise that would be coming from the wind
9 turbines; is that right?

10 A. Correct.

11 Q. I'd like to refer you to your report that
12 is attached as Exhibit K to the application. Just
13 let me know when you have it in front of you.

14 A. I need the other binder.

15 I have arrived.

16 Q. Good. Turn to page 2 please.

17 A. Okay.

18 Q. And this page has some information about
19 your background noise study; is that right?

20 A. Yes.

21 Q. Now, when you did your background noise
22 study, you selected a number of locations where you
23 would put up microphones to measure the background
24 noise; is that correct?

25 A. Yeah. We put up sound level monitors.

1 Q. What is a sound level monitor? Does that
2 include a microphone?

3 A. Yeah. Microphone is just a transducer
4 but the actual instrument is a sound level meter, an
5 integrating sound level meter that measures and
6 stores sound levels.

7 Q. And you selected nine locations for this
8 background study?

9 A. Yes.

10 Q. On page 2 of your report Exhibit K you
11 will see position 1; is that right? Is that a
12 photograph of the first monitor?

13 A. Yes.

14 Q. And am I correct in assuming that the
15 oblong object that is attached to the fence post in
16 the foreground of that photograph is your instrument?

17 A. Yes, it is.

18 Q. It's attached to a fence post on a fence,
19 right?

20 A. On a fence, yeah.

21 Q. What was the purpose of that fence, do
22 you know?

23 A. It was to separate the yard and the house
24 from a large field, as I recall.

25 Q. Appears to me that it looks like a fence

1 that's commonly used for keeping livestock. Would
2 you agree with that?

3 A. It looks that way.

4 Q. Were there any livestock at this location
5 when you set up or took down your instrument?

6 A. No, there weren't. This is the middle of
7 January.

8 Q. Well, is it common sometimes if the
9 weather gets nicer in January to allow, for example,
10 cattle to forage in fields?

11 A. I suppose that's possible.

12 Q. Did you check during the days that you
13 had the instrumentation at this location to make sure
14 that there weren't any animals inside this fence?

15 A. No.

16 Q. So, so far as you know, there could have
17 been animals inside the fence creating noise; is that
18 right?

19 A. Could have been a whole herd in there,
20 yes.

21 Q. Let's go to the next page. Monitor 2 is
22 located on a telephone pole; is that right?

23 A. Yes.

24 Q. And there's a fence in the background of
25 this picture; is that correct?

1 A. Yes, there is.

2 Q. Do you know whether this fence was used
3 to hold animals?

4 A. No, that was just a backyard of the
5 house.

6 Q. Monitor No. 3 on the bottom of that
7 photograph, that is also on a telephone pole; is that
8 right? Or a utility pole of some sort?

9 A. That's correct.

10 Q. And it's located right next to the
11 driveway; is that right?

12 A. It's, yeah, it's next to a very long
13 driveway, almost a road. Yes, that's right.

14 Q. Are there a number of houses at the end
15 of that road or along that road or just one?

16 A. There's the one you see in the picture
17 there and then there's one further down out of the
18 picture off to the right a good ways.

19 Q. So every time a car or another vehicle
20 goes past on this road, this instrument's going to
21 pick up that noise; is that right?

22 A. Yes. But I would iterate it's a private
23 driveway, not a road per se.

24 Q. Go to position 4 on page 4. Again you
25 have the instrument on a post of some sort; is that

1 right?

2 A. Yeah.

3 Q. It's on a post and the post is next to a
4 fence; is that right?

5 A. Right.

6 Q. Was this fence used to hold livestock or
7 other animals?

8 A. No.

9 Q. Go to monitor 5. There again your
10 instrument's on a pole next to a fence, right?

11 A. Right.

12 Q. Do you know whether livestock or other
13 animals were in that fence?

14 A. No, I don't believe there were any
15 animals around there.

16 Q. Do you know for sure during the two weeks
17 that you were doing your study that there were no
18 animals held in that pen?

19 A. No. I suppose it's possible.

20 Q. Did you visit any of these instrument
21 locations between the time you set them up and the
22 time you took them down?

23 A. No. The normal procedure is to set them
24 up and then let them run and then come back and
25 retrieve the instrumentation.

1 Q. That's the normal procedure or according
2 to what's standard?

3 A. There is no standard for doing this kind
4 of work.

5 Q. Well, there is a standard, is there not,
6 that provides that you should actually know what
7 noises cause spikes in the noise levels during the
8 time the instruments are set up?

9 A. I don't have any standard that
10 specifically says that. Of course, we want to know
11 what the cause is of everything that we're measuring,
12 but it's impractical to be there at all these nine
13 positions for two weeks.

14 Q. Let's go to page 5, position 6. And here
15 you have the monitor on a tree; is that right?

16 A. It's a tree.

17 Q. Monitor 7 is attached to a utility pole,
18 right?

19 A. Right.

20 Q. Go to next page. Monitor 8 is on a tree.

21 A. Yeah.

22 Q. Position 9 looks like you got another
23 monitor on a fence; is that right?

24 A. Yes.

25 Q. Do you know whether there was livestock

1 or other animals held in that fence during the two
2 weeks you had the instrument at that location?

3 A. Well, didn't see any on the first date.
4 I guess they could have been in there later.

5 Q. Now, are you aware of an ANSI standard
6 that requires sound tests that requires the
7 microphones for sound tests to be kept off of poles
8 and trees?

9 A. I'm not aware of any standard that says
10 that.

11 Q. I'm going to hand you what has been
12 marked as UNU Exhibit 55.

13 (Exhibit marked.)

14 Q. I've handed you what has been marked as
15 Exhibit 55. Do you recognize this as ANSI standard
16 S12.9?

17 A. Yes, I see that's what it is.

18 Q. And are you familiar with this standard?

19 A. Somewhat, yes.

20 Q. And you're familiar enough with this
21 standard to know that it provides standards for
22 measuring sound?

23 A. Yes, that's the purpose of it.

24 Q. Go to page 4 of that standard please.
25 I'd like you to look at section 8.1 entitled "Site

1 Selection."

2 In B you will see that it states
3 "Microphones should be located 7.5 meters or farther
4 from any surface where reflections may influence the
5 measured sound pressure levels."

6 Do you see that?

7 A. Yes, I do.

8 Q. And under "Notes," No. 1 says "Reflecting
9 objects with small dimensions (trees, posts, bushes,
10 et cetera) should not be within 1.5 meters of the
11 microphone position."

12 See that?

13 A. Yes.

14 Q. And No. 2 Notes says "Reflecting surfaces
15 refer to those other than the ground, which, by
16 8.28(a), are normally between 1 and 2 meters from
17 microphone."

18 See that?

19 A. Yes.

20 Q. Now, isn't it true that placing
21 microphones on trees and poles and posts increase the
22 noise level that your instrumentation measures
23 because noise is reflected off of the post and the
24 trees and the post into the microphone?

25 A. No, I wouldn't agree with that at all.

1 Part of the reason for putting them on those
2 locations was to get them away from any reflecting
3 surfaces. Reflecting surfaces are large walls or
4 things of that nature.

5 Q. Well, look again at Note No. 1. Does it
6 not say reflecting objects with small dimensions,
7 such as trees, posts, and bushes should not be within
8 1.5 meter of the microphone position?

9 A. It says that but I don't agree with that.

10 Q. So you don't agree with an ANSI standard?

11 A. That is correct.

12 Q. Your microphone was closer than 1.5 meter
13 of the trees, posts, and poles in every one of your
14 nine positions, was it not?

15 A. That's correct. And I'm not worried
16 about any reflections from those fence posts.

17 Q. If there is a reflection off of the fence
18 post or the poles, that would make your measurements
19 higher than they were truly found to be in the
20 environment; isn't that correct?

21 A. If the reflected sound was at all
22 significant, yes.

23 Q. Incidentally, were all of your background
24 sample locations located in the current Buckeye Wind
25 Project area?

1 A. I don't think they're in the current
2 project area because at the time of the survey the
3 project had extended further up to the north there.
4 So the idea was to measure over the site area as it
5 was at the time.

6 Q. Some of the monitors were set up in Logan
7 County, weren't they?

8 A. That's correct, yeah.

9 Q. How many of them?

10 A. Just a moment.

11 Just one.

12 Q. Monitor 2 was in Logan County?

13 A. That's correct.

14 Q. And for reference sake, there is a map
15 showing the monitor locations attached to Exhibit K;
16 is that right?

17 A. Yes. It's graphic A towards the end.

18 Q. Birds tend to sit on wires, don't they?

19 A. Yes, I suppose so.

20 Q. In fact, birds love to sing on wires,
21 don't they?

22 A. I've seen that happen.

23 Q. So if you have wires near your
24 microphone, chances are the birds could sit there and
25 sing for a while; isn't that right?

1 A. Yes. That's part the reason that we
2 record or look for the L90 primarily.

3 Q. And if the bird is singing right next to
4 the microphone, that could be a pretty loud noise in
5 the instrumentation.

6 A. Could.

7 Q. Isn't that one reason why -- isn't it for
8 that reason that acoustical engineers recommend that
9 you not put your microphones next to wires?

10 A. I've never heard any recommendation about
11 not putting microphones near wires.

12 Q. Go to page 11 of Exhibit 55. I'd like
13 you to look at the Notes under section 10.1. The
14 first note says "If the source(s) measurement period
15 is divided into small measurement time blocks, then
16 the total duration of the good measurements is given
17 by the number of nondiscarded measurement blocks
18 multiplied by the duration of each block in seconds."

19 You see that?

20 A. Yes.

21 Q. What's anticipated with this part of the
22 standard is that there may be some blocks of time in
23 which sound is measured that will be discarded for
24 one reason or another; is that right?

25 A. I believe that's what this section is

1 talking about.

2 Q. And one of the reasons why an acoustical
3 engineer may discard a segment of sound is because
4 there may have been a short-term loud noise during
5 that time period; is that right?

6 A. Right.

7 Q. So if the bird sings on the wire or
8 livestock bellows into the microphone, then you would
9 want to discard that part of the time; is that
10 correct?

11 A. Yeah, you don't want that kind of
12 contamination.

13 Q. But because you were not there when these
14 measurements were taken, you had no idea whether any
15 of these time blocks needed to be discarded for those
16 reasons; is that right?

17 A. That's correct.

18 Q. And that's another reason why you used an
19 L90 measurement instead of, for example, an Leq.

20 A. Right.

21 Q. I'm going to show you another document
22 which is going to be labeled as UNU Exhibit 56.

23 (Exhibit marked.)

24 Q. Do you recognize Exhibit 56 as an article
25 entitled "Wind-induced pseudo-noise and leaf-rattle

1 noise" by Paul Schomer and others?

2 A. I see that's what it says here but I'm
3 not familiar with this report.

4 Q. Okay. Paul Shomer, of course, is the
5 same Paul Shomer that we mentioned previously in your
6 testimony?

7 A. Yes, it is.

8 Q. But you don't recognize this document?

9 A. No, I don't.

10 Q. Let me refer you to one of the figures in
11 the back. Unfortunately the pages of this document
12 are not numbered, but I'd like you to find figure 6.

13 Now, you will recognize that in figure 6
14 there is a setup for sound measurement; is that
15 correct?

16 A. Looks like a setup for sound measurement
17 and a weather station, yes.

18 Q. In the lower left-hand corner of this
19 photograph you will see the weather station, right?

20 A. Right.

21 Q. And that includes an anemometer to
22 measure wind speed?

23 A. Uh-huh.

24 Q. And then towards the middle right of the
25 photograph you will see the instrumentation to

1 measure the sound, including a microphone, right?

2 A. Yes.

3 Q. And unlike the microphones that you set
4 up on poles and posts, this one's set up on a tripod;
5 is that right?

6 A. Yes, it is.

7 Q. And this would prevent anything, any
8 noise from bouncing off of an object that is next to
9 the microphone; is that correct?

10 A. Right.

11 Q. What criteria did you use to select the
12 locations for your background noise survey?

13 A. We wanted to measure at locations that
14 were evenly distributed over the entire project area
15 as it was then envisioned.

16 We wanted to capture a number of
17 different settings in terms of locations that were
18 open and exposed to the wind and others that were
19 less exposed.

20 The ultimate goal was to determine what
21 the typical sound level was at homes in the site
22 area, in the backyard, for instance.

23 Q. Were the microphones always set up in the
24 backyard or were there occasions in which the
25 microphones were set up between the home and the

1 road?

2 A. I think in most instances it was either
3 the backyard or a side yard or no yard at all, just
4 in the field.

5 Q. Were any of these monitor stations
6 located near a state highway?

7 If you need to refresh your memory by
8 looking at graphic A, feel free to do that.

9 A. Yeah, the monitor 6 location is near it's
10 Route 36. And the idea there was to get that setting
11 what's happening at houses that are on busy roads.

12 Q. And you got monitor 7 located fairly
13 close to the same highway; is that right?

14 A. Fairly close but somewhat removed.

15 Q. And then you have monitor 8 located on
16 Highway 161. Is that a state highway?

17 A. It's a significant road as I recall.

18 Q. And then you got monitor 9 located nearby
19 Route 29. Is that a state highway?

20 A. Yes. And the idea there was to get what
21 was going on in the Village of Mutual.

22 Q. So out of the eight monitors that you had
23 set up in Champaign County, four of them were located
24 near busy highways; isn't that right?

25 A. No, I think I would characterize monitor

1 6 as meeting that definition but the other ones were,
2 although it looks like they're right on the road in
3 graphic A, they were quite some distance back.

4 Q. How far is monitor 7 from the state
5 highway?

6 A. I don't know. It's quite a ways though.

7 Q. How far is monitor 9 from Highway 29?

8 A. Well, you can see it on the picture on
9 page 6 of the report when we were looking at all of
10 our monitor positions. Figure 2.2.9. The road is on
11 the other side of the church there.

12 Q. All right. So it's close to the highway.

13 A. Well, it's got that field in between.

14 Q. Uh-huh.

15 A. Which is sizeable.

16 Q. Well, with regard to monitor 7, do you
17 believe that that monitor picked up road noise from
18 the state highway?

19 A. I think it may have been partially
20 influenced by that.

21 Q. Now monitor 1 although it's in Champaign
22 County is not in the project area, is it?

23 A. Yeah, that was in the project area at
24 that time.

25 Q. It's not in the project area as it is

1 currently configured in this application, is it?

2 A. That's correct.

3 Q. And monitor 3 is also not in the project
4 area it currently exists; is that right?

5 A. That's correct.

6 Q. So that leaves you with six monitor
7 stations that are in the project area; is that right?

8 A. Yeah, as it's currently planned, yes.

9 Q. And out of these six monitors, two of
10 them are located nearby State Route 36, one's located
11 nearby Route 161, and the other one is located by
12 Route 29; is that right?

13 A. Yes.

14 Q. Given that four out of six of the
15 monitors in your project area are located nearby
16 these roads, don't you believe that your background
17 noise levels picked up a substantial amount of road
18 noise?

19 A. I think some of the monitors might have
20 been influenced by that. However, if you look at
21 figure 2.5.2. on page 12 of the report, this amount
22 shows the results from all of the monitors including
23 the ones that are up beyond the current site
24 location.

25 And what this graph shows is that the

1 sound levels in all the positions were very similar,
2 follow the same trends, they all went down at the
3 same time, they all went up at the same time, over
4 the entire period.

5 Now, this indicates that if one of the
6 positions was skewed upwards by traffic noise, the
7 results from that position would be higher than all
8 the rest of them.

9 But in January all general -- all these
10 levels intertwined with each other and there's no one
11 position that's significantly higher than the other.
12 So we feel like there's nothing wrong with this data

13 Q. Let me ask you this, the figure that you
14 have just referred us to states that it is showing
15 the L90 sound levels, right?

16 A. That's right.

17 Q. And the purpose of using an L90 means of
18 measurement is to eliminate the false impressions
19 that intermittent noise, for example, highways adds
20 to your equations, right?

21 A. Yeah, the L90 would essentially remove
22 sounds from sporadic traffic and all kinds of other
23 things, such as birds and cows walking around.

24 Q. And that's one reason why you use an L90
25 instead of an Leq for these purposes.

1 A. Yeah, that's correct.

2 Q. And if you were using the Leq, the Leq
3 would not filter out those intermittent noises that
4 were coming from busy highways.

5 A. Yeah, that would more closely reflect
6 those intermittent events.

7 Q. Because you're measuring out both the
8 high events and the low events and everything in
9 between with an Leq, right?

10 A. Yes.

11 Q. And so the Leq is going to be influenced
12 to show higher noises in your background by virtue of
13 the fact that highway noise is being measured in.

14 A. Yes, that's the reasons that we primarily
15 rely on the L90.

16 Q. How did you find people willing to host
17 these monitor stations?

18 A. Most of these people were project
19 participants and the reason that we usually took
20 monitors at participants' houses is because it's just
21 easier to get permission to come on the property and
22 leave instruments there.

23 Q. Did these participants, were these
24 participants informed as to what role these noise
25 measurements were going to play in the project?

1 A. I think some may have wondered about it
2 but most people just said sure, go put it there, no
3 problem.

4 Q. But they knew who you were and who you
5 were representing, right?

6 A. Yeah. I believe people from the project
7 called ahead to, just to make sure it was okay.

8 Q. Now, after you calculated these
9 background noise levels, then you used that
10 information in a model; is that right?

11 A. No. Not directly. The purpose of the
12 background survey was to determine the existing sound
13 level as a function of wind speed to use as a datum
14 to then compare project noise to, and that is derived
15 for modeling.

16 Q. So the information from the background
17 noise survey provided you with data that you used in
18 the model.

19 A. No, we didn't use that in the model. The
20 model just predicts the project sound level only.

21 Q. So you used it to compare against the
22 sound levels predicted for the turbines by the model.

23 A. Yeah. Yeah, the primary objective is you
24 determine the background level and then the ideal
25 performance for the project is to not exceed that L90

1 background level by more than 5.

2 Q. We'll discuss that in a little bit more
3 detail later in your testimony.

4 As is implicit from your testimony, you
5 performed a noise model to predict the amount of
6 noise that the turbines being installed by Buckeye
7 Wind would produce, correct?

8 A. Correct.

9 Q. And is it true that you used the model
10 provided in ISO Standard 9613-2?

11 A. That's correct.

12 Q. Does the model described in this standard
13 have a margin of error?

14 A. The ISO standard lists certain
15 uncertainty factors for certain conditions.

16 Q. What is an "uncertainty factor"?

17 A. It's a plus or minus error on the result
18 of the model calculation.

19 Q. Is that not the same thing as a margin of
20 error? Am I using the wrong term?

21 A. We call it an uncertainty factor.

22 Q. We'll use your term.

23 What was the uncertainty factor in the
24 model that you used?

25 A. For sources that are located above

1 30 meters, the standard does not give a specific
2 uncertainty factor.

3 Q. When you say "above 30 meters," you're
4 talking about noise sources that are higher than
5 30 meters in the air?

6 A. That's correct.

7 Q. Is it fair to say that the uncertainty
8 factor for a source that is higher than 30 meters
9 will be -- at least will have an uncertainty factor
10 of at least 3 decibels?

11 A. Yeah, that's the theoretical uncertainty
12 published in standard. However, for sources above 30
13 it will be somewhat above 3 theoretically.

14 Q. Okay.

15 A. Now, if I had no idea what the accuracy
16 of my modeling was because I had never field tested
17 it against actual wind turbine projects, I might be
18 concerned about that.

19 But the fact of the matter is that we've
20 at this point done extensive operational tests at
21 this .5 large wind project similar to Buckeye where
22 we've monitored at eight to ten individual locations
23 similarly spaced to these ones here in Buckeye over
24 the site area, usually near the closest houses.

25 We measure continuously for two weeks in

1 a similar fashion to this background survey, L.

2 We also put monitors off of the site two
3 miles away to keep a time history of the background
4 level during the survey so that we can then correct
5 the on-site data for background contamination and
6 determine what the project-only sound level is at
7 these monitoring stations.

8 And what we found is that in all five of
9 these sites and essentially all of the positions on
10 each site were getting nearly exact agreement between
11 what was measured and what's predicted prior to the
12 project.

13 So even though the standard may say well,
14 there's a theoretical error, that's not what we're
15 finding.

16 Q. What are the names of these wind projects
17 that you measured for this purpose?

18 A. I'm not sure these test results have been
19 made public, but I can say that two of the projects
20 were in New York, one was in Wisconsin, one was in
21 Minnesota, and one was in Texas.

22 Q. What are their names?

23 A. I believe the Noble Bliss Wind Park
24 report had been released.

25 Q. Noble Bliss is in which state?

1 A. It's in New York State.

2 Q. What is the name of the other one in New
3 York?

4 A. I'm not sure if I'm at liberty to say.

5 Q. I don't think you have any choice but to
6 say.

7 A. I wouldn't mind saying, I'm just not sure
8 if I'm under some kind of restriction.

9 MR. SETTINERI: Your Honor, in the event
10 the witness is under any confidentiality agreement,
11 which may be the case based on the answers here, if
12 that is the case, to protect those agreements we
13 would ask that we go into in-camera session, counsel
14 only, and let the record be sealed as to these
15 answers and questions.

16 As well if briefing comes up and in that
17 brief the disclosure would be made, we would ask that
18 those portions of brief be filed under seal.

19 MR. VAN KLEY: Your Honor, it was the
20 witness who volunteered this information to begin
21 with. Which I would add wasn't even responsive to
22 the question.

23 But if he is going to argue that in the
24 past his predictions have been the same as the
25 results, then we're entitled to know what wind farms

1 those are so that we can test his hypothesis.

2 So I can ask him to establish whether
3 there's a confidential agreement and if there is, I
4 would not object to having it sealed in the way that
5 counsel has suggested.

6 If that is the case, what I would suggest
7 we do is do that at the end of his testimony so that
8 if there are other things that also come up that are
9 confidential, we can do it all at the same time and
10 we won't inconvenience people to have to leave right
11 in middle of hearing and come back.

12 We could dismiss everybody, finish up his
13 testimony with the rest of the attorneys and then
14 close for the day. That would be my recommendation.

15 ALJ STENMAN: Let me just ask you,
16 Mr. Hessler, are you under a confidential agreement
17 with respect to these other wind farms?

18 THE WITNESS: Yeah, I believe the other
19 four, yes.

20 ALJ STENMAN: How many other wind farms
21 are we basing this on? There's five or six?

22 THE WITNESS: We're talking about five.

23 ALJ STENMAN: And you've given us one and
24 there's four more.

25 THE WITNESS: That's correct.

1 ALJ STENMAN: Then we will do as Mr. Van
2 Kley suggested, we'll continue with questioning and
3 at the end of the session we'll deal with this
4 in-camera, that way everyone else can leave.

5 MR. VAN KLEY: Thank you, your Honor.

6 MR. SETTINERI: That's fine.

7 BY MR. VAN KLEY:

8 Q. Isn't it true that ISO Standard 9613-2
9 was not even intended for use for sound sources above
10 30 meters in the air?

11 A. No, not at all. It's used all the time
12 for high sources like chimney and stack exits.
13 There's no restriction on its use, it just doesn't
14 get a specific uncertainty factor.

15 Q. Well, take a look at the standard, and I
16 think we have another document that may not have its
17 pages numbered. Go to the fourth page of this
18 document.

19 A. Which document?

20 Q. That's Exhibit 56 that we've been talking
21 about.

22 A. Counsel, are you referring to the ANSI
23 standard?

24 Q. No, I'm referring to ISO 9613-2.

25 ALJ SEE: No.

1 MR. VAN KLEY: We haven't even talked
2 about this, have we? I'm sorry for goofing everybody
3 up, I'm ahead of myself. Maybe we better mark it now
4 since I've kind of polluted the record on that.

5 Q. I'm going to hand you what has been
6 marked as Exhibit UNU 57.

7 (Exhibit marked.)

8 Q. All right, now I've handed you 57. That
9 is the ISO Standard 9613-2, isn't it?

10 A. That's right.

11 Q. Now go to the fourth page of that
12 document. I'd like to direct your attention to the
13 right-hand column, the second paragraph where it says
14 "This method is applicable in practice to a great
15 variety of noise sources and environments. It is
16 applicable, directly or indirectly, to most
17 situations concerning road or rail traffic,
18 industrial noise sources, construction activities,
19 and many other ground-based noise sources."

20 You see that?

21 A. No, I don't. I'm sorry, it's on page 4?

22 Q. It's the fourth page of the document.

23 A. What section of the document?

24 Q. It's Part 2. Labeled "General method of
25 calculation."

1 A. Okay, yeah, I see that.

2 Q. Now, isn't it true that based on this
3 sentence that this standard is designed for
4 ground-based noise sources?

5 A. That's correct.

6 Q. Isn't it true that if a wind turbine is
7 492 feet in the air, that it is more similar to a low
8 flying aircraft than it is to a ground source?

9 A. No. Wind turbines are located firmly on
10 the ground.

11 Q. However, they're also located well in the
12 air; is that right?

13 A. Yes.

14 Q. And in fact they're located as high as
15 low flying aircraft may fly; is that correct?

16 A. That would be a very low flying aircraft.

17 Q. I'd like to direct your attention to
18 Table 5. Since we've already discussed this I wanted
19 to point this out. It's on page 14 towards the back.

20 Let me know when you find that.

21 MR. SELVAGGIO: Are we talking about
22 Exhibit 57?

23 MR. VAN KLEY: Exhibit 57, correct.

24 A. Yeah, I found it.

25 Q. And this is the table that has the

1 uncertainty factors listed in it, correct?

2 A. Correct, yes.

3 Q. And on the right-hand column you will see
4 that for noise sources that are higher than
5 100 meters and lower than 1,000 meters there is an
6 uncertainty factor plus or minus 3 decibels, right?

7 A. It's not lower or higher, it's distance
8 that that column is talking about.

9 Q. This is the distance from the noise
10 source?

11 A. Yes.

12 Q. So if you are measuring the noise source
13 at a distance of between 100 meters and 1,000 meters,
14 then the uncertainty factor is plus or minus
15 3 decibels.

16 A. Not measuring but predicting the noise
17 coordinate.

18 Q. Got it. With that correction, that's
19 correct.

20 A. That's right.

21 Q. Did you disclose this uncertainty factor
22 anywhere either in Exhibit K to the application or in
23 the text of the application?

24 A. It's addressed in the text.

25 Q. Could you show me where in the text it's

1 addressed?

2 A. It would be on page 33.

3 Q. Are you in the application or are you in
4 Exhibit K?

5 A. I'm in Exhibit K.

6 Q. Okay. Where on page 33 did you disclose
7 the margin of error?

8 A. Primarily in that paragraph numbered
9 No. 1.

10 Q. What language do you believe discloses
11 this uncertainty factor?

12 A. Well, this describes the circumstance
13 where it is highly likely that the actual project
14 sound level will vary from the predicted level shown
15 in the contour plots.

16 And I've expanded on that in my direct
17 testimony to add plus or minus 5 in there and that is
18 the result of field measurements rather than
19 theoretical uncertainty.

20 Q. So according to your direct testimony you
21 believe that the noise level from the turbines that
22 you predict in your model have an uncertainty factor
23 of 5 decibels.

24 A. Yeah, they have a variance about the main
25 predicted level that's very close to plus or minus 5.

1 And I believe most of that is due to variations in
2 the noise output from the turbines rather than any
3 weakness in the prediction methodology.

4 Q. Where does the other 2 decibels in your
5 uncertainty factor originate?

6 A. Well, I think I just said it's not an
7 uncertainty factor. When I say the levels, the
8 predicted levels are probably going to vary by plus
9 or minus 5, that is from observations and
10 measurements of actual wind turbine performance
11 relative to predictions.

12 And as I mentioned, I think it's due to
13 variability in the turbine sound rather than anything
14 to do with the calculation methodology.

15 Q. Now, earlier when you said that the
16 measurements you took of sound at these five wind
17 farms that are operating closely matched the
18 predicted levels in the models, did you observe the
19 5 decibels difference between the two?

20 A. Yeah. What we found is that the measured
21 sound level from the turbines when plotted as a
22 function of wind speed has scatter to it. Turbines
23 don't put out a constant sound level.

24 So over many, many data points, usually
25 we'll collect 2,000 measurements at each position.

1 We then plot that as a function of wind speed and
2 then calculate the project level at a variety of wind
3 speeds from usually 4 or 5 meters per second up to 9.

4 And the agreement that I mentioned before
5 is with the mean trend line through the measured
6 turbine performance. Predicted level falls directly
7 in the middle of the measured scatter.

8 Q. Go back to page 33 of Exhibit K of the
9 application please. To that paragraph that you have
10 informed us discusses the uncertainty factor.

11 I'm still trying to find the language in
12 there that does that. Can you tell me what specific
13 language discloses the uncertainty factor?

14 A. Well, I'm not specifically talking about
15 the uncertainty factor, I'm basing these comments and
16 these conclusions on firsthand experience.

17 Q. Is there anyplace in the application
18 either in Exhibit K or the body of the application
19 where you disclosed the 5 decibels of potential
20 variability from your predicted model levels?

21 A. Well, that's what it says in this
22 paragraph that we're talking about here.

23 Q. In the paragraph on page 33?

24 A. Yeah.

25 Q. Where do you see the 5-decibel variation

1 level disclosed?

2 A. Well, it's not given specifically as 5.
3 It just says there's going to be variation and the
4 levels are going to be higher at times than
5 predicted.

6 Q. Okay, are you looking at the last
7 sentence of that paragraph which says "This means
8 that somewhat higher sound levels from the project
9 may well occur from time to time"?

10 A. Right. Right. And that's why I wanted
11 to clarify in my direct testimony that I believe that
12 the actual quantification of that is a plus or minus
13 5.

14 Q. During the time that Buckeye Wind's
15 application has been pending before this Board, have
16 you informed the Board's staff about this 5-decibel
17 degree of uncertainty?

18 MR. SETTINERI: Objection;
19 mischaracterization. He's testified repeatedly it's
20 not an uncertainty.

21 The witness has testified about the
22 difference between what the 5 decibel constitutes and
23 what uncertainty previously, and counsel repeatedly
24 goes back to uncertainty.

25 MR. VAN KLEY: I'll reword.

1 ALJ STENMAN: Okay.

2 Q. Mr. Hessler, at any time during the time
3 when this application has been pending before the
4 Board did you inform the staff that your predicted
5 modeled sound levels might vary by either adding or
6 subtracting 5 decibels to that predicted level?

7 A. No, I didn't specifically inform anybody.
8 It's this statement here in bullet item 1 is still
9 accurate to this day.

10 Q. Now, you also used some information about
11 at least one of the turbine models that Buckeye Wind
12 is thinking about using for its project when you did
13 your modeling, correct?

14 A. I'm sorry, I got lost in the middle of
15 that question.

16 Q. I'll reask it.

17 Isn't it true that when you did your
18 model you used some noise information provided by the
19 manufacturer of one of the wind turbine models that
20 is being considered by Buckeye Wind for this project?

21 A. Yes. I made use of sound power level
22 data on both of the potential turbines.

23 Q. And "both of those turbines" means which
24 two?

25 A. The Nordex N90 and REpower MM92.

1 Q. It seems that even after rewording my
2 question I still got it wrong, so I better reask it.

3 At any time during the pendency of this
4 Buckeye Wind application before the Board did you
5 inform the Board's staff that the actual noise level
6 of the wind turbines, once they start operating,
7 could vary by up to 5 decibels from the sound levels
8 that were predicted by your model?

9 A. Sounds like the same question from five
10 minutes ago, but, no, I didn't inform anybody.

11 Q. All right. I was informed I messed up
12 the question so I had to ask it again.

13 You had just told us that you used sound
14 information provided by the manufacturers of two of
15 the turbines being considered by Buckeye Wind. Did
16 you use both of those to perform your model or did
17 you pick one of them?

18 A. I had to end up using a combination of
19 data from both manufacturers. And the reason for
20 that is that the sound power level as a function of
21 wind speed was given by both manufacturers.

22 I believe it's the REpower unit had a
23 slightly higher sound power in most wind speed bins
24 so I wanted to use the highest of the two for the
25 modeling. So I wanted to base the modeling on the

1 REpower as opposed to the Nordex N90.

2 Now, the REpower data that came from the
3 manufacturer did not provide any frequency content
4 and just gave the overall A-weighted sound power.

5 Now, the sound powers from two units are
6 almost identical in all wind speeds. So I needed a
7 frequency spectrum to do the model properly. So I
8 had to use the frequency content from the Nordex unit
9 with the overall sound power of the REpower.

10 Sounds complicated but I had to make the
11 best of limited information.

12 Q. Why did -- actually, let's just turn to a
13 page of Exhibit K so we can follow along here.

14 Turn to page 23 of Exhibit K of the
15 application please. Actually start on page 22.

16 A. Right.

17 Q. Do you have that in front of you?

18 A. Yes, I do.

19 Q. The bottom of page 22, your report states
20 in the last sentence "At the present time two
21 different makes and models of turbine are being
22 considered."

23 And you go to the next page and you'll
24 see the two models that you just mentioned, right?

25 A. Right.

1 Q. Under table 3.2.1 on page 23, the first
2 sentence states "Because the REpower values are
3 slightly higher, the modeling studies will rely
4 exclusively on these sound levels as inputs."

5 See that?

6 A. Right.

7 Q. Why were you relying on the REpower
8 values due to the fact that they were slightly
9 higher?

10 A. Well, I just wanted to use the loudest
11 turbine to cover all eventualities.

12 Q. Because if you didn't use the loudest
13 turbine, then if Buckeye Wind used the loudest
14 turbine, your model would underpredict noise levels,
15 right?

16 A. Correct.

17 Q. And you will see that in table 3.2.1
18 there are some numbers that talk -- that identify the
19 sound power levels, see that?

20 A. Yes, I do.

21 Q. And those are in dB(A), correct?

22 A. You have to be careful. It's dB(A) with
23 reference to 1 picowatt. Those are sound power
24 levels, not pressure levels.

25 Q. And as you will see by comparing the two

1 columns as you have stated, the sound power level for
2 the REpower MM92 is higher than the sound power level
3 for the Nordex N90, right?

4 A. Yes. Only by a little bit.

5 Q. Now, these power levels are normalized to
6 a 10-meter height; is that correct?

7 A. Yes. The wind speeds given in the
8 right-hand column are at as would be measured at
9 10 meters, yes.

10 Q. And the same is true for the Nordex N90?

11 A. Yeah, the wind speed is -- applies to
12 both the turbines in subsequent columns.

13 Q. To clarify for the record what
14 normalizing means, it means that you calculate the
15 wind speed as it would be at a level 10 meters above
16 the ground.

17 A. Yeah. That comes out of the IEC 61400
18 test, which is the way wind turbines are measured.
19 They're all measured on kind of an equal footing so
20 they can all be compared, and the reference wind
21 speed that's always used is 10 meters.

22 Now, that is actually when you do the
23 test, and we've done this test, you measure the wind
24 speed using a 10-meter METS mast during the
25 measurements. So there actually is no normalization

1 in the test itself. You're directly measuring the
2 10-meter wind speed.

3 Q. It's true, isn't it, that the actual wind
4 speeds at 492 feet above the ground would be
5 different than the wind speeds at 10 meters above the
6 ground ordinarily?

7 A. Ordinarily, yes.

8 Q. So it's important if you're going to
9 compare two different kinds of turbines that you
10 evaluate the amount of wind speed unit normally to
11 the same level, which in this case is 10 meters.

12 A. That's right, yes. Keeps everything on
13 an even footing.

14 Q. Are you aware that Mr. Shears has
15 testified that Buckeye Wind might choose a model
16 other than the ones identified in the application?

17 A. No, I'm not.

18 Q. Are you aware that that may occur?

19 A. No. That's the first I hear of that.

20 Q. Now, were you aware that the application
21 actually discusses the potential that Buckeye Wind
22 might choose a third model as well as it might choose
23 the two models that you looked at?

24 A. Isn't that the same question? Yeah.

25 Q. Well, actually what I'm asking is

1 slightly different.

2 Are you aware that the application itself
3 actually identifies a third model being considered
4 for this project?

5 A. No, I never heard anything about any
6 other models besides these.

7 Q. I want to ask you about the main body in
8 the application in front of you.

9 A. That's the other binder you mean?

10 Q. I would hope so. Maybe your counsel can
11 identify it for you.

12 MR. SETTINERI: Mr. Van Kley, are you
13 referring to the text of the application?

14 MR. VAN KLEY: Yes. Page 13 please.

15 Q. Do you have that document in front of
16 you?

17 A. Still working on it.

18 I'm on page 13.

19 Q. Do you see a heading named "Wind
20 Turbines"?

21 A. Yes, I do.

22 Q. Look at the first sentence of that
23 heading please where it says "The final manufacturer
24 of the wind turbine has not been selected, however,
25 included in Exhibit A are details of the Nordex N100

1 Nordex N90, and REpower MM92 which are representative
2 of the type turbine anticipated to be used for the
3 facility."

4 See that?

5 A. Yes.

6 Q. So at the time that you performed your
7 model you were not aware that Buckeye Wind was
8 thinking about using the model Nordex N100?

9 A. That's correct. I hadn't heard about
10 that.

11 Q. Pardon?

12 A. Wait a minute.

13 No, that's the first I hear of the N100.

14 Q. I've marked what is identified as UNU
15 Exhibit 58.

16 (Exhibit marked.)

17 Q. I'll represent to you this is a document
18 that was provided to us by Buckeye Wind's counsel in
19 discovery in this case.

20 You're familiar with noise measurements
21 by manufacturers of wind turbines, are you?

22 A. Yes, I am. Done them myself.

23 Q. And Exhibit 58 is typical of such noise
24 measurements that you have used for your models?

25 A. Yes.

1 Q. I think your microphone may be off.

2 A. Is that better? The battery went dead on
3 the other one.

4 Q. Turn to the second page of Exhibit 58
5 please.

6 A. Got that.

7 Q. See that there is an apparent sound power
8 level column?

9 A. Right.

10 Q. Is that the same type of information that
11 you see on page 23 of Exhibit K of the application
12 that is labeled "Sound Power Level"?

13 A. That's correct, yeah.

14 Q. And different sound levels are provided
15 for different wind speeds, right?

16 A. Right.

17 Q. I'd like you to compare the apparent
18 sound levels for the Nordex N100 for the same speeds
19 as you would have provided the sound power levels for
20 the REpower MM92 that you used in your model on page
21 23 of Exhibit K.

22 A. Right.

23 Q. So starting with 5 meters per second, the
24 REpower has a sound level of 101.6, and the Nordex
25 N100 has a sound level of 103; is that right?

1 A. That's correct, yeah. The N100 is a
2 louder turbine.

3 Q. And at the wind speed of 6 meters per
4 second, the Nordex N100 has a noise level of 106.5
5 compared to the level of the REpower model of 103.6;
6 is that right?

7 A. Right.

8 Q. And at 7 meters per second wind speed,
9 the N100 has a noise level of 107.5 and the REpower
10 model has a noise level of 105, right?

11 A. That's right.

12 Q. And it is at that wind speed that the
13 noise level peaks and stays the same in both models.

14 A. Right.

15 Q. So as you say, as you've said, the Nordex
16 N100 is a noisier model than the REpower model that
17 you put into your sound model.

18 A. Right.

19 Q. So your -- the model that you prepared
20 for this application could be off by as much as
21 between 2 and 3 decibels; isn't that right?

22 A. Yeah.

23 Q. Now, let's talk about the standard that
24 you used to evaluate the noise level from the REpower
25 model that you actually did analyze. I believe that

1 you have alluded to IEC Standard 61400-11. Is that
2 the standard you used?

3 A. I used for what?

4 Q. The standard you used to evaluate the
5 sound levels from the REpower turbine.

6 A. Yeah, the inputs to the model were based
7 on this IEC.

8 Q. And this standard also has an uncertainty
9 factor, doesn't it?

10 A. A very small one, yes.

11 Q. Isn't it an uncertainty standard of
12 2 decibels?

13 A. When you do the test you actually
14 calculate it based on the specifics of what happened
15 during that test.

16 Normally comes out less than 2, and I
17 think the accuracy of it is even -- that's the
18 theoretical uncertainty, but I think the actual
19 accuracy of that test is very high.

20 It's a very meticulous test, it's very
21 difficult to do. Takes into account every minor
22 factor from barometric pressure to wind speed,
23 everything.

24 And as an example, we tested a turbine
25 down in Texas in strict accordance with this

1 procedure and got an answer that was exactly equal to
2 a similar test that was done by a different engineer
3 on the same turbine in Spain two years earlier, with
4 the exact same answer.

5 This test is highly controlled so the
6 errors are very small.

7 Q. But it is not always the case that you
8 have that degree of matching the predicted rules;
9 isn't that right? There is variation from test to
10 test and turbine to turbine?

11 A. But I would characterize it as very
12 small.

13 Q. I'm going to hand you what's been marked
14 as UNU Exhibit 59.

15 (Exhibit marked.)

16 Q. I would like to direct your attention to
17 page 41 of that document please.

18 A. Yes, I've got that.

19 Q. Table D.1 has the uncertainty factors in
20 it; is that right?

21 A. Right.

22 Q. And it provides a potential typical
23 standard uncertainty for various components, such as
24 calibration instrument, et cetera, right?

25 A. Right, yeah.

1 Q. And if you would add up all those
2 potential uncertainties, you would come to
3 approximately 2.6 decibels of uncertainty; is that
4 right?

5 A. I don't believe that's the case. They
6 don't just add up arithmetically. You have to take
7 the square root of the sum of the squares and so on.
8 But I know when I did this test I think I remember
9 the error coming out to 1.4, 1.6 something.

10 Q. Good thing you said that because I would
11 have asked you to calculate it. So you just saved
12 yourself some time.

13 A. All right.

14 Q. Not to mention sparing the rest of us
15 during that time.

16 Is this the same standard that you use
17 for all of your wind projects?

18 A. Yes. I would say it's involved in every
19 project whether I do the test or someone else has
20 done this test.

21 Q. Are you familiar with the term "line
22 turbine" as contrasted to the term "point turbine"?
23 Or "point source turbine"?

24 A. I'm familiar with the terms "line source"
25 and "point source," yes.

1 Q. And a point source generally is one
2 discrete location from one discrete source that's
3 producing sound?

4 A. Right.

5 Q. And it's an isolated source of that
6 sound?

7 A. It doesn't have to be isolated, but,
8 yeah. A point source is a source that tends to
9 radiate at sound out in a spherical or hemispherical
10 pattern.

11 Q. And a line source is what?

12 A. A line source is an -- usually find as an
13 infinitely long line, as the name would imply, where
14 the sound radiation from the source is uniform and
15 coherent over the entire length of the source.

16 An example would be flow noise in a pipe.
17 I measured a gas line in Saudi Arabia one time that
18 was certain sound level five feet from the valve and
19 was the same sound level a thousand feet from the
20 valve. That would be a line source.

21 Q. Can you apply these terms to wind
22 turbines?

23 A. Wind turbines can always be considered
24 point sources only.

25 Q. Are there instances in which wind

1 turbines can be considered line sources?

2 A. Not to my knowledge, no.

3 Q. I take it from your comments then that
4 you modeled the Buckeye Wind turbines as point
5 sources.

6 A. That's correct.

7 Q. And you did not account for any variation
8 in the sound levels that may have resulted from
9 considering them to be line sources.

10 A. No, there's no turbines on the site that
11 even the ones that are in geometric lines that would
12 be remotely considered line sources.

13 Q. What is the criterion to define a source
14 as the line source in your view?

15 A. Well, in the example of that pipe I was
16 talking about, the sound has to radiate in a
17 uniformed and coherent way from the entire line.

18 Even if you lined up turbines tip to tip
19 in a row, they would still be acting as point
20 sources. There's no reason why a turbine would
21 radiate its noise any differently because of the
22 presence of other turbines near.

23 Q. If a source is a line source, that would
24 cause a difference in the way that the sound travels
25 from the wind turbine; is that right?

1 A. Well, for a line source the sound
2 radiates in a cylindrical pattern rather than a
3 hemispherical or spherical pattern.

4 Q. Isn't it true that for line sources the
5 sound emanating from those sources will dissipate or
6 decay at a lower rate than it would from a point
7 source?

8 A. Yeah. And that goes back to the
9 geometric formula for area of the cylinder as opposed
10 to area of a sphere.

11 Q. So if wind turbines were in lines that
12 were regarded as line sources, that would mean that
13 the sound from those turbines would travel a farther
14 distance.

15 MR. SETTINERI: Object, your Honor. The
16 witness already testified that wind turbines are
17 point sources, not line sources.

18 MR. VAN KLEY: I'm asking him a
19 hypothetical and we're entitled to test his opinion
20 because, as we will show later in this hearing,
21 they're line sources. Some of them are.

22 ALJ STENMAN: Overruled.

23 Q. Do you remember the question?

24 A. Could you refresh my memory.

25 Q. I hope you do because I phrased it for

1 you well for a change.

2 A. I think I remember it.

3 Q. Okay.

4 A. I think the answer is that --

5 ALJ SEE: Mr. Hessler, would you like the
6 question read back?

7 THE WITNESS: Okay, let's read back the
8 question.

9 (Record read.)

10 A. For a line source that is true that the
11 decay rate would be less than for a hemispherical
12 source.

13 Q. So assuming for a moment that some of the
14 turbines in Buckeye Wind's wind farm were line
15 sources, that would mean that your model has
16 underpredicted the distance that the sound from these
17 turbines will travel.

18 A. The fact of the matter is the turbines
19 are point sources rather than lines. So the model is
20 done correctly.

21 Q. Well, that wasn't the question. I asked
22 you to assume for sake of argument that some of the
23 turbines in Buckeye Wind's project are line sources.

24 That is the case, then your model has
25 underpredicted the distance that the sound from these

1 turbines will travel.

2 A. If the turbines in a row somehow acted as
3 a line source, then the prediction or the predicted
4 level of a given distance would be different.

5 Q. The actual level would be higher than the
6 predicted level, correct?

7 A. Yes.

8 Q. I want to hand you what's been marked as
9 UNU Exhibit 60.

10 (Exhibit marked.)

11 Q. Do you have that document in front of
12 you?

13 A. Yes, I do.

14 Q. And you will see that this is a study or
15 a paper that has been performed for the U.S.
16 Department of Energy and other agencies as well as
17 for NASA; is that right?

18 Actually let me rephrase that.

19 Go to the third page of the document
20 please. And you will see that this paper is a joint
21 project of the U.S. Department of Energy and the
22 American Society of Mechanical Engineers that has
23 been performed by NASA, correct?

24 A. Yes.

25 Q. Have you seen this document before today?

1 A. I have skimmed through it.

2 Q. I'd like to refer you to page 19 of the
3 document. Go to the bottom of that page please under
4 the heading "Line Sources."

5 And it says there "For an infinitely long
6 line source, the decay is only minus 3 decibels per
7 doubling of distance, compared with the minus 6 dB
8 per doubling of distance illustrated in figure 7-18."

9 And it's true, isn't it, that figure 7-18
10 deals with the sound decay for point sources?

11 A. Yeah, for point source, yes.

12 Q. And it says "Such a reduced decay rate is
13 sometimes observed for sources such as trains and
14 lines of vehicles on a busy road. Some arrays of
15 multiple wind turbines in wind power stations may
16 also behave acoustically like line sources."

17 See that?

18 A. Yeah. Operative word "may."

19 Q. Uh-huh. If I recall, you have testified
20 today that wind turbines are never line sources; is
21 that correct?

22 A. That's correct. Because they're not
23 coherent wind sources.

24 Q. So apparently NASA disagrees with your
25 position; is that right?

1 A. I disagree with their researcher's work
2 here, yes.

3 Q. So you disagree with NASA's position.

4 A. I have all the respect in the world for
5 NASA, but this is a mistake here.

6 Q. Now, when you performed your model for
7 noise, you assumed that the ground would absorb
8 one/half decibel of the noise?

9 A. No, that's incorrect.

10 Q. All right. Did your model take into
11 account any absorption from the ground?

12 A. Yes, it did.

13 Q. And how did you account for that?

14 A. In the ISO 9613 sound provocation
15 methodology, there is a method for accounting for the
16 interaction of the sound waves with the ground
17 surface.

18 And in the model we, well, what you do is
19 you assign a coefficient ranging from zero to 1; zero
20 being completely reflective like the surface of a
21 lake or 1 being completely absorptive like sand on a
22 beach.

23 For this site and majority of others that
24 are similar we found the .5 coefficient accurately
25 replicates what really happens.

1 Q. And is there a correlation between
2 decibel level and a .5, what did you say?

3 A. It's a coefficient.

4 Q. Coefficient, okay.

5 A. It's a coefficient that goes into a
6 rather complex calculation.

7 Q. Is there a correlation between the two?
8 Between decibel level and the coefficient?

9 A. The lower the coefficient, the higher the
10 predicted level at a particular point.

11 Q. So by using a coefficient of .5, how much
12 did that decrease the predicted decibel level of the
13 wind turbines?

14 A. It's a very small effect, couple of dB.

15 Q. Couple of decibels?

16 A. Yeah. At distances we're talking about
17 here, thousand feet, 2,000 feet.

18 Q. The basis for this coefficient is that it
19 assumes that some of the noise will be absorbed by
20 the ground if it's soft enough; is that correct?

21 A. That's correct.

22 Q. Now, if the ground is frozen during the
23 winter, is it your opinion that the .5 coefficient
24 would still be accurate for that situation?

25 A. Yes. In the dead of winter I've walked

1 through many farm fields where the ground has kind of
2 developed a porosity because it's frozen and it's
3 porosity that absorbs the sound waves.

4 The only thing that would be reflective
5 would be a very smooth, hard-packed ice layer. And
6 that would be a zero coefficient.

7 But we believe that what we're trying to
8 capture in the models is what happens most of the
9 time, not the 2 percent of the time that it's a wind
10 swept tundra out there. So we use .5 as a year-round
11 design basis because that is what we found from field
12 measurements that that accurately characterizes or
13 makes the predictions correct.

14 Q. In Champaign County on how many days in
15 the winter is the ground typically frozen?

16 A. I don't know.

17 Q. You didn't look at that when you decided
18 your coefficient?

19 A. Like I said, if the ground is frozen,
20 that doesn't mean it's completely reflective at all.
21 I just got done saying that fields are often porous
22 when they're frozen.

23 Q. What would the proper coefficient be for
24 the ground if it were frozen compared to your .5
25 coefficient?

1 A. If it were frozen smooth and reflective,
2 as if covered with ice, then it would be a zero
3 coefficient.

4 Q. Please go to page 20 of Exhibit K to the
5 application.

6 A. I'm on that page.

7 Q. My copy of Exhibit K appears to have
8 walked off.

9 I'd like to refer you to table 2.5.2 on
10 this page. Now, the model that you performed assumes
11 that the wind speed hitting the turbines will not
12 exceed 6 meters per second in the daytime; is that
13 right?

14 A. That's correct, because we've determined
15 that at a 6-meter per second wind, under those
16 conditions the turbine level would be maximum
17 relative to the amount of background sound level
18 available, the L90 sound level to potentially obscure
19 the project.

20 So meaning that the -- we call that the
21 critical wind speed, that's when the project is most
22 likely to be audible. Higher wind speeds the
23 background level continues to increase to the point
24 where it provides much more masks for the project.

25 Q. And is it true that for nighttime

1 conditions your model assumes that the speed will not
2 be greater than 5 meters per second?

3 A. Let me just double check.

4 Yeah, that's correct.

5 Q. And what was your reason for that
6 assumption?

7 A. It's the same reason; at 5 meters per
8 second based on the nighttime lower background level,
9 the point of maximum audibility, potential audibility
10 for turbines occurs during 5 meters per second wind.

11 If we had modeled an 8-meter per second
12 or 9-meter per second wind, we would have come out
13 with a totally different result that showed much less
14 potential impact.

15 Q. Let's explore the basis for your decision
16 to do that. Is it true that you're assuming that at
17 higher wind speeds the background noise from leaf
18 rustle and other things will mask the wind turbine
19 sound?

20 A. Yes, that's correct.

21 Q. And what did you base that assumption on?

22 A. Well, we've been able to determine from
23 the background survey what the background level is as
24 a function of wind speed, and this site and all
25 others essentially it continues to increase with wind

1 speed indefinitely.

2 If a tornado came through it would be
3 extremely loud.

4 Q. Now, if the wind turbines are operating
5 at a higher wind speed, the noise from the wind
6 turbines will continue to increase as the wind speed
7 gets faster as well; is that correct?

8 A. Only partially. Once the turbine comes
9 online at first it makes very little noise at all,
10 and then it kind of ramps up over a few meter per
11 second wind speed, then reaches a plateau once the
12 rotors are at -- reaches full rpm.

13 The noise stays the same all the way up
14 to cutout speed while the background level does not
15 plateau, continues to go up.

16 Q. The cutout speed with the wind speed at
17 which the turbine is shut down for safety reasons?

18 A. Correct.

19 Q. At what wind speed does the REpower model
20 of turbine reach its plateau?

21 A. At 8 meters per second.

22 Q. And despite the fact that the sound
23 levels from this turbine model reach -- increase
24 until it reaches a wind speed of 8 meters per second,
25 nevertheless, you have assumed that the worst case

1 noise produced by the wind turbine will not get --
2 will not -- will occur at 6 meters per second during
3 the daytime and 5 meters per second during the
4 nighttime.

5 Did you get all that or should I try
6 again?

7 A. Not quite sure I understand what the
8 question was.

9 Q. Let me do it again.

10 Despite the fact that the wind turbines
11 do not reach their maximum noise level at 6 meters
12 per second during the daytime and 5 meters per second
13 during the nighttime, nevertheless you have assumed
14 that those wind speeds provide the worst case noise
15 scenario for this project.

16 A. Yes, that's correct. Because what we
17 look at is the differential between the turbine sound
18 power level and the background level. At each wind
19 speed.

20 Q. And you are assuming that at wind speeds
21 between 5 and 8 meters per second during nighttime
22 and 6 and 8 meters per second wind speed at
23 nighttime, that the extra noise from the wind itself
24 will mask the extra noise from the turbines?

25 MR. SETTINERI: Objection. The witness

1 previously testified regarding plateauing of noise
2 turbines so the objection is to mischaracterization
3 of testimony.

4 MR. VAN KLEY: I don't think I can -- I'm
5 asking the witness to confirm whether I'm right or
6 wrong.

7 My counsel tells me I messed up this
8 question too and I better reask it.

9 ALJ STENMAN: All right.

10 MR. VAN KLEY: He's listening better than
11 I am to my own questions.

12 BY MR. VAN KLEY:

13 Q. Let me try again, Mr. Hessler.

14 Is it the case that you are assuming that
15 because the wind itself produces more noise at higher
16 speeds, that this higher wind noise will mask the
17 higher turbine noise at wind speeds above 5 meters
18 per second at night and 6 meters per second during
19 the day?

20 A. I think the answer to that is yes. But
21 let me explain a little bit more how we do this.

22 Q. Sure.

23 A. If we look at table 3.3.2, that's talking
24 about the nighttime, this is page 25 of Exhibit K.
25 This table at the top has wind speeds from 4 to

1 10 meters per second as measured as 10 meters.

2 Everything's on the same terms here.

3 The REpower sound power level is the next
4 column or the next row, excuse me, and down below are
5 the background levels measured for these wind speeds.

6 So in the bottom row, for example, at
7 5 -- in the 5-meter per second column, the
8 differential between turbine power level of 101.6 and
9 the measured L90 background level of 29 is a value of
10 72.4. That's the differential.

11 And we want to do the model at where that
12 differential is at a maximum. If, for example, we
13 said we're going to model the maximum turbine sound
14 power level at a wind speed of 8 meters per second,
15 the differential between the power level and the
16 background level is 67.3, you can see in that 8
17 column.

18 That's about 5 dB difference between
19 those two differentials but what that would translate
20 to is that the L90 plus 5 threshold for an impact
21 would shrink in by 5 dB if we modeled at 8 meters per
22 second. It would be a much smaller potential impact
23 area.

24 What we're looking at, what we want to
25 look at is the largest potential impact area. When

1 we first started doing this I thought too we should
2 just use the maximum turbine power level, but that's
3 not always where the maximum impact occurs.

4 And in fact that's -- we found from
5 talking to people that aren't happy about wind
6 turbine noise they say it's usually happening at a
7 middling wind speed rather than at high winds.

8 Q. And when you make these assumptions you
9 are also assuming that the wind speed near the
10 surface of the ground where people can hear it is
11 going to be noisy.

12 A. Yeah. Now, how we get the correlation
13 between the background sound level and the wind speed
14 is that we measure the sound level at ground level
15 where people are on those fence posts, the infamous
16 fence posts, and we compare those results to the wind
17 speed measured high up on a MET mast, so essentially
18 we're relating the sound levels measured at ground
19 level or near ground level to the wind speeds up high
20 that are going to be seen by the turbines, not the
21 wind speed at the ground level where microphone are.
22 That wind speed's likely to be very low.

23 What we're interested in is what is the
24 wind speed that the turbines are going to experience
25 and what is the sound level at those speeds. So

1 we're taking the wind speed up here and comparing the
2 sound level down here.

3 Q. And is the sound level of the wind near
4 the surface of the ground important here to mask the
5 sounds of the turbines?

6 A. Yeah, that's correct. It's what's heard
7 at ground level that counts and that's what we're
8 measuring with the instruments with the sound level
9 monitors.

10 Even though it may not be windy at 5 feet
11 above the ground, these are the sound levels that are
12 happening.

13 Q. And because the actual wind noise that is
14 experienced by a person on the ground is produced by
15 the leaf rustle and the whipping of the wind through
16 buildings, et cetera, that you hear when you're
17 standing on the ground, right?

18 A. Right.

19 Q. And that is the noise that you say is
20 masking the turbine noise that occurs from the
21 turbine at 492 feet.

22 A. Yeah, that's correct. Centered at a hub
23 height of 80 meters, which is lower than that.

24 Q. And going back to our earlier discussion
25 about normalizing wind speed, that is a mechanism for

1 comparing the wind speed at surface to the wind speed
2 at hub height for turbine; is that right?

3 A. That's right.

4 Q. And if you know the wind speed at the
5 surface, then by the process of normalization you
6 ordinarily can estimate the wind speed at hub height.

7 A. You usually can't accurately convert from
8 the wind speed measured at say 1 meter above the
9 ground to determine what the wind speed is at the hub
10 height. That's because near the ground the wind
11 speed rapidly changes and theoretically goes to zero
12 at the surface.

13 The way this normalization occurs in our
14 analysis is we start with the wind speed measured at
15 a high elevation, at least 40 meters up, and it's
16 normalized from there down to 10.

17 So that the wind speed can't be directly
18 related to the turbine sound power level which is
19 expressed as a wind speed of 106 meters.

20 Q. I perhaps misphrased my question. I
21 should have asked you whether you could normalize
22 both the hub wind speed and the surface wind speed to
23 the 10 meters above the ground.

24 Would that be a better way of asking the
25 question?

1 A. Yeah. And then it would only work -- you
2 could normally calculate from the hub height down to
3 10 but you wouldn't be able to accurately go the
4 other way.

5 Q. Okay. So there's no formula that you
6 could use to predict wind speeds at let's say 3 feet
7 or 5 feet off the ground if you knew the wind speed
8 at 10 meters above the ground. You just can't do
9 that.

10 A. No. The curve is too steep down there.
11 So what we do nowadays is we'll use a weather station
12 similar to the one we looked at in that picture a
13 while ago to measure directly the wind speed at 1
14 meter at the microphone height.

15 But the only importance of that is just
16 to make sure there's no wind-induced distortion
17 affecting the microphones.

18 Q. I'd like to direct your attention back to
19 UNU Exhibit 58. Which you will recall is a document
20 that provides noise measurements for the Nordex N100.

21 A. Okay, I'm back to that.

22 Q. Given the difference in the noise level
23 produced by the N100, how would this affect the
24 assumptions you used in table 3.3.2? If you used the
25 N100 model instead of the REpower model?

1 A. Well, I'd have to plug the values in and
2 calculate the differentials, but it's the usual
3 result is that the critical wind speed is about 6,
4 6 meters per second. And I suspect it would be
5 similar for this turbine, but I'd have to do all the
6 math.

7 Is this microphone still working okay?

8 Q. It's doing great.

9 Now, the winds in the Buckeye Wind
10 Project area do exceed 6 meters per second in the
11 daytime and 5 meters per second at night; is that
12 right?

13 A. Oh, certainly, yeah.

14 Q. Have you measured the wind speed in the
15 Buckeye Wind Project area?

16 A. The wind speed was measured during the
17 survey by at least one mast. I forgot whether it was
18 more than one.

19 Q. You actually used a meteorological
20 station to get your data that was operated by
21 somebody else, right? Maybe the U.S. Weather Service
22 or something, National Weather Service?

23 A. No, it was an anemometer erected by the
24 project to study wind speeds on the site.

25 Q. I see, okay. And you had access to that

1 wind speed data?

2 A. Yeah. It was provided to me after the
3 survey, yes.

4 Q. And in fact some of that data appears in
5 Exhibit K on page 8, doesn't it?

6 A. No, the data I'm talking about starts on
7 page 9 and continues on page 10.

8 Q. What's the information on page 8 under
9 "Weather Graphs"?

10 A. That's just the general parameters of
11 temperature and barometric pressure. That was from
12 referenced weather station, that information is of
13 little value.

14 It's really the wind speeds measured by
15 turns out it's two MET masts that we used, 40 meters.

16 Q. So the wind speed was measured by these
17 towers at a level 40-meter above the ground?

18 A. That's right.

19 Q. So you would not be able to use this data
20 to predict the wind speeds that occurred during the
21 background noise study at the level of your
22 microphones.

23 A. No, it could only be estimated by using
24 the IEC formulation. But I wouldn't rely on that
25 because what we found in subsequent surveys where we

1 do measure directly at 1 meter, the wind speeds high
2 up and the wind speeds down low do not necessarily
3 parallel each other. When one goes up, the other
4 ones don't always go up.

5 But the wind speeds at 1 meter generally
6 remain fairly low at 3 or 4 meters per second even
7 during very windy conditions.

8 Q. Are the wind speeds in figure 2.4.2
9 normalized to the level of 10 meters? Or are these
10 the actual wind speeds at 40 meters?

11 A. Yeah, that's the as-measured wind speed
12 at 40 meters from those two MET masts.

13 On the next page those two levels have
14 been averaged and then normalized to 10 meters.

15 Q. If you were to normalize or if you were
16 to use this wind data to establish the wind speeds
17 during this period at hub height, what would these
18 wind speeds be?

19 A. That's best answered by looking at page
20 21, there is a graphic that shows the typical wind
21 speed with as a function of elevation. So in this
22 particular example we have an 80-meter hub height
23 wind of just over 11 meters per second, and that
24 would theoretically correspond to an 8-meter per
25 second wind at 10 meters.

1 Q. Generally speaking, is there about a
2 3-meter per second differential between the wind
3 speed at 10 meters and the wind speed at 80 meters?
4 Is that generally the formula?

5 A. Yeah, that's the order of magnitude, but
6 the shape of this curve changes as wind speed
7 increases or decreases. So it's just not a fixed
8 thing that could be shifted back and forth.

9 Q. So based on the weather data that you
10 collected, what was the range of wind speeds at hub
11 height? Just give me approximate. I don't need it
12 exactly.

13 A. Well, it looks like the maximum measured
14 wind speed at 40 meters per second -- I mean, excuse
15 me, at 40 meters above ground level, it briefly got
16 up to 16 meters per second during the survey.
17 40 meters.

18 So it would be on the order of 1 to 1-1/2
19 meters per second faster than that at hub speed.

20 Q. During approximately what percentage of
21 the time did the wind speed at hub height -- I'm
22 sorry, I should reask that question.

23 During what percentage of the time
24 approximately did the actual wind speeds that you
25 measured at the site in these towers exceed the

1 6 meters per second per day used in your model during
2 the daytime and the 5 meters per second per day using
3 your model for nighttime?

4 A. You can see that graphically on page 10
5 on figure 2.4.3.

6 Q. And these are normalized wind speeds just
7 like the wind speeds you use as assumptions in your
8 model of 5 and 6.

9 A. Well, not in the model but these are the
10 wind speeds that actually occurred at 10 meters.
11 Assuming the normalization is exactly accurate.

12 Q. Are you aware of a wind study that
13 Buckeye Wind performed on the project area?

14 A. Wind study in terms of studying the wind
15 resource?

16 Q. Yes.

17 A. Not aware of it. I'm sure it's been done
18 but I have no knowledge of it.

19 Q. Did you ask Buckeye Wind for whatever
20 wind speed information it had so that you could use
21 it in your work?

22 A. No.

23 Q. So you don't know whether Buckeye Wind's
24 wind study data, if it exists, is consistent with
25 your wind speed data.

1 A. What the long term wind speeds are on
2 site is not really relevant to what we were looking
3 at here. We were just trying to determine or what we
4 did determine is what is the typical background sound
5 level at various wind speeds of interest over the
6 range of wind speeds of interest.

7 Whether 6 meters per second blows all the
8 time or just a small percentage of the time is
9 irrelevant.

10 Q. And you really don't know the answer to
11 that question, do you?

12 A. We know what the background level is at a
13 6-meter per second wind seed. The frequency of its
14 occurrence is irrelevant.

15 Q. And you don't know what the frequency of
16 its occurrence is.

17 A. No.

18 Q. What if any literature finds that leaf
19 rustle and other wind noise will mask wind turbine
20 noise during wind speeds higher than what you've
21 assumed in your study?

22 A. The frequency spectrum of the typical
23 background noise that's associated with leaves
24 rustling and things like that, peaks that around a
25 thousand hertz, and that's not inconsistent with the

1 spectrum shape of turbine noise.

2 Whenever two sounds are similar, the one
3 can mask the other. However, we go on to say in the
4 conclusions and I think elsewhere that whenever a
5 sound has any kind of character to it, any kind of
6 amplitude modulation, those sorts of things, it makes
7 it more susceptible.

8 And so we're not saying here that the
9 background sound level is a perfect masking source
10 for turbine noise, we're just saying that it does
11 provide some masking, but is limited by the character
12 of turbine noise.

13 Q. So because of the amplitude modulation of
14 the turbine blades, a person may hear the blades even
15 though the wind noise exceeds 6 meters per second
16 during the daytime and 5 meters per second at night.

17 A. Yes. But they are most apt to hear them
18 down around that 5- or 6-meter per second ranges.

19 Q. Going back to my question, can you point
20 me to any scientific literature or engineering
21 literature that specifically finds that at a certain
22 wind speed the noise of the wind will mask the noise
23 of the turbines?

24 A. I don't know of any study that looked at
25 that. As I mentioned, we've done a number of field

1 studies where we've looked at the background level
2 and the project level and compared them. The
3 background level is significant when it's windy.

4 Q. But none of your work was peer reviewed.

5 A. I am talking about work done for analyses
6 for a particular project and things, not research
7 papers.

8 ALJ STENMAN: Mr. Van Kley, how much
9 longer do you think you have in terms of cross?

10 MR. VAN KLEY: Quite a bit.

11 ALJ STENMAN: Let's take a 10 minute
12 break until 4:20 and we'll come back.

13 (Recess taken.)

14 ALJ STENMAN: Let's go back on the
15 record.

16 Mr. Van Kley, whenever you're ready.

17 MR. VAN KLEY: Thank you, your Honor.

18 BY MR. VAN KLEY:

19 Q. Mr. Hessler, before the break I had asked
20 you whether any of your studies of wind noise
21 concerning leaf rustle and other wind noise, masking
22 wind turbine noise resulted in peer reviewed papers.
23 I believe the answer to that is no?

24 A. No, I don't think anybody's done that
25 specific research.

1 Q. Let's talk about low frequency noise for
2 a little bit.

3 Isn't it true that about 70 decibels of
4 low frequency noise is filtered out by the
5 A-weighting in the dB(A) formula?

6 A. No.

7 Q. Do you have a figure as to how much low
8 frequency noise is filtered out by the dB(A) formula?

9 A. It's not filtered out but a factor is
10 applied to the actual measured sound pressure in a
11 particular frequency.

12 For example, at a 31-1/2 hertz octave
13 band frequency, the A-weighting factors a minus
14 39 dB. There's a set of factors that is frequency
15 dependent.

16 Q. And that 39 dB would be -- would consist
17 of low frequency noise?

18 A. Yeah, 31-1/2 hertz is usually -- that's
19 in the low frequency range of spectrum. And 39
20 represents the degree of insensitivity to the human
21 ear at that frequency. You hear it as if it's 39
22 lower than it actually is.

23 Q. Now, you're not saying that humans are
24 unable to hear low frequency noise, right?

25 A. That's right.

1 Q. It's obvious they can.

2 A. Yeah, sure.

3 Q. Is it true that even the upwind bladed
4 turbines produce some low frequency noise?

5 A. Just about every sound source has some
6 low frequency content to it.

7 Q. And this would include upwind turbines?

8 A. Yes.

9 Q. And while I'm asking about upwind
10 turbines, isn't it true that all of the turbine
11 models used in the United States are upwind turbine
12 blade models?

13 A. Now it is, yes.

14 Q. Are you aware of any wind farms that have
15 used downwind turbines in the United States?

16 A. There's some old ones out in North Palm
17 Spring in California.

18 Q. That's it?

19 A. They're the ones that I'm aware of.

20 Q. How long have -- during what year did the
21 wind industry predominantly switch to upwind blades?

22 A. I don't know. Sometime in the '90s I
23 guess.

24 Q. Isn't it true that the low frequency
25 component of turbine noise can be higher inside of a

1 neighbor's home than outside of the neighbor's home
2 due to resonance occurring?

3 A. Yes, that is correct.

4 Q. Does your model address this concern?

5 A. The model is concerned with the
6 A-weighted sound level over the site. Low frequency
7 noise is discussed in the text in the report.

8 The model does consider low frequency
9 noise in the sense that the input sound power level
10 for the turbine includes the frequency spectrum
11 starting at 31-1/2 hertz and going up from there.

12 And the model is frequency dependent in
13 its calculation. So it takes into account the full
14 frequency content of the turbine.

15 Q. But that underestimates the amount of low
16 frequency noise that would be predicted by the
17 turbines, does it not?

18 A. No, not at all. No, it's got the sound
19 level of the turbine as measured without A-weighting.
20 That's the input to the model.

21 The result of the calculation is the
22 A-weighted sound contours. But the input
23 incorporates the spectrum without modification.

24 Q. Isn't it true that noise reductions due
25 to the decay of noise from a source are larger at

1 higher frequencies than at lower frequencies?

2 A. Yes. That's why we input the full
3 frequency spectrum into the model so that can be
4 taken into account in the calculations.

5 Q. Let's talk a little bit more about the
6 wind speeds that you were observing at the project
7 site when you did your background study.

8 Go to page 7 of Exhibit K please.

9 A. Yes.

10 Q. I'd like to refer you to the top
11 paragraph there. If you could find the sentence that
12 starts "at a height of 1 meter."

13 A. Yes, I see that.

14 Q. It says "At a height of 1 meter the
15 microphones were nominally exposed to inconsequential
16 wind speeds of about 3 or 4 meters per second during
17 the wind conditions of greatest interest (6 to
18 8 meters per second as measured at the IEC standard
19 height of 10 meters above grade)."

20 You see that?

21 A. Yeah.

22 Q. Now, is the reason that you made this
23 statement based on the fact that you wanted to show
24 that the wind speeds near the surface of the ground
25 were not distorting the sound measured by your

1 microphones?

2 A. Yes. That's why we talk about it here,
3 yeah.

4 Q. But you did not actually measure the wind
5 speed at 1 meter above the ground, did you?

6 A. No. That was estimated through that
7 curve that we talked about where I said before they
8 couldn't get an accurate transfer function.

9 Q. Right.

10 A. But this is an estimate and in all
11 subsequent surveys we have set up a weather station
12 next to the meters and this has turned out exactly
13 true.

14 Q. But wind speeds vary site by site at
15 least to some degree, don't they?

16 A. Yeah. But this is consistent with every
17 other survey done since this one.

18 Q. And isn't it true that wind companies do
19 wind data surveys at a site because there's a
20 variance in wind resources at the sites?

21 A. Yes.

22 Q. Are you familiar with ANSI Standard
23 S12.18? Or do you need to see a copy of it to be
24 sure?

25 A. What is the title of that standard?

1 Q. I'll mark it and show it to you.

2 (Exhibit marked.)

3 Q. This will be Exhibit UNU 61. I've handed
4 you Exhibit 61.

5 A. Yes.

6 Q. Do you recognize this as a copy of ANSI
7 Standard 12.18?

8 A. Yes, I recognize it.

9 Q. Did you use this standard during your
10 work on this wind farm?

11 A. This standard was never written with the
12 intent of guiding the background survey for a wind
13 project. So we may follow it in general form, but I
14 don't think it can be followed rigorously.

15 Q. What makes you say that it doesn't apply
16 to background noise study?

17 A. Because I believe in here it places an
18 upper limit on the wind speed at the microphone
19 position and in order to avoid distortion issues.

20 When the fact of the matter is what we're
21 after here is the sound level as a function of wind
22 speed. We can't sit around waiting for calm
23 conditions that you would be able to do if you were
24 measuring a conventional power plant, for instance.

25 We're deliberately looking for sound

1 levels as a function of wind speed. So we cannot
2 stay and you can't tell that from measuring under
3 calm conditions.

4 So that's why we have undertaken a
5 research study to quantify the effect of wind-induced
6 distortion in microphones. We tested a number of
7 wind screens and a wind tunnel and measured the
8 actual distortion. And that is in a peer reviewed
9 published article.

10 What that showed was that using the type
11 of oversized wind screen that we used, that in terms
12 of measuring the A-weighted level there's no
13 significant distortion until you get to a wind speed
14 of between 15 and 20 meters per second at 1 meter
15 above the ground. Below that wind speed the
16 distortion from the wind blowing is negligible.

17 Q. In that regard I'd like to refer you to
18 page 5 of Exhibit 61. And put your finger there and
19 then go to page 7 of the same document.

20 On page 7 it states that method 2
21 provided by this standard is used as a precision
22 method for accurate measurements, right?

23 A. That's what it says here.

24 Q. And go now to page 9 of the document.
25 And under 5.1.1 you will see that one of the purposes

1 of this standard is to measure ambient sound
2 measurements, correct?

3 A. Correct.

4 Q. Then 5.1.2 on the same page identifies
5 source measurements of noise as another purpose for
6 the document.

7 A. Right.

8 Q. Now, going back to page 5 where you
9 started, you will see that for method 1 the first
10 paragraph specifies that "No sound level measurement
11 shall be made when the average wind velocity exceeds
12 5 meters per second when measured at a height of 2
13 plus or minus .2 meters above the ground."

14 You see that?

15 A. Right. That's exactly what I was talking
16 about.

17 Q. Exactly.

18 A. That's what limits this standard's
19 applicabilities to researching background levels for
20 wind.

21 Q. And for method 2, paragraph 2, you will
22 see that there it is said that wind velocity may not
23 exceed 3 meters per second measured at the same
24 height in order to perform the precision method for
25 accurate measurements in that standard; is that

1 correct?

2 A. Yes.

3 Q. And the reason that this standard has
4 those limitations is because at wind speeds higher
5 than those identified in these two methods,
6 acoustical engineers have found that there is wind
7 distortion in the microphone that is used to measure
8 sound; is that right?

9 A. That's right. That's why we undertook
10 that study to quantify that and exclude it from the
11 data.

12 Q. But your study has not at this point been
13 adopted into any ANSI standard or any of the other
14 peer reviewed standards for acoustical engineering,
15 has it?

16 A. That is correct. Doesn't mean it's
17 invalid though.

18 Q. In fact, doesn't it say in the standard
19 that if wind -- if noise measurements are taken in
20 situations where the wind speeds are higher than
21 those amounts, that that data should be discarded?

22 A. Yes.

23 Q. Now, let's go to page 17 of Exhibit K of
24 the application.

25 A. Okay.

1 Q. And put your finger there and also go to
2 page 15 of your Exhibit K of the application.

3 A. Okay.

4 Q. Let's talk about this regression analysis
5 that you performed that is provided on page 15 of
6 your Exhibit K.

7 A. Okay.

8 Q. What was the purpose of that regression
9 analysis?

10 A. That was to figure out what the
11 background level typically is as a function of wind
12 speed. Top one is daytime measurements and the
13 bottom one's nighttime measurements. Both the L90
14 values.

15 Q. What are the data points that you used
16 for this regression analysis that constitutes all
17 those dots that you see in the figures?

18 A. Every dot is one 10-minute measurement of
19 the L90 value after it's been correlated to the wind
20 speed measured by those two MET masts.

21 Q. So these wind speeds are all normalized
22 to 10 meters, right?

23 A. Yeah.

24 Q. And the point of these regression
25 analyses was an attempt to show that at higher wind

1 speeds there would be more noise available to mask
2 the noise from the turbines; is that correct?

3 A. I wouldn't call it an attempt. That's
4 what it clearly shows.

5 Q. And this is what you based your -- let me
6 start over.

7 It was on this information that you based
8 your formula for determining when there would be the
9 greatest differential between wind noise and turbine
10 noise.

11 A. Right.

12 Q. And you based that on the fact that the
13 line going through your regression analysis has an
14 upward trend; is that right?

15 A. Right.

16 Q. And that upward trend you believe shows
17 that at higher wind speeds you have more noise; is
18 that right?

19 A. That's correct.

20 Q. Now, if you were to disregard all of the
21 data point for wind speeds over 5 meters per second,
22 under the assumption that the wind noise at over
23 5 meters per second resulted from wind distortion of
24 the mics, make that assumption for me please, how
25 would this line look using the rest of the data

1 between zero to 5 meters per second?

2 A. Well, that is the reason that that ANSI
3 standard cannot be used for this kind of analysis.
4 It takes a new approach to get a sensible answer in
5 these things.

6 You don't want to use the background
7 level that's measured under low wind conditions and
8 hope to compare that to what's happening under windy
9 conditions. That's just apples to oranges.

10 Q. Isn't it true that under your theory that
11 there would be more wind noise at 4 meters per second
12 than let's say 2 meters per second?

13 A. Yes.

14 Q. So if you were going to perform a
15 regression analysis on only those data points between
16 zero and 5 meters per second, would you have a line
17 that is flat or a line that goes upward as you get to
18 higher speeds?

19 A. Well, you wouldn't have even embarked on
20 this whole approach to determining the ambient. It
21 would have been no point had you been limited wind
22 speeds under 5 meters per second.

23 Q. Well, answer my question please.

24 A. And your question was if we disregarded
25 all the data about 5 meters per second what would

1 happen to the regression?

2 There wouldn't be any regression, would
3 just sit there, might be a straight line. Might
4 still go up a little bit.

5 MS. NAPIER: Excuse me, it's hard to hear
6 him again. He's turning his head away from the mic.
7 Thank you.

8 ALJ STENMAN: Is the mic still on?

9 THE WITNESS: I think the battery might
10 be going -- oh, that's good.

11 Q. When turbine blades are moving faster
12 than 6 meters per second during the daytime and
13 5 meters per second during the nighttime, isn't it
14 true that there will be additional noise resulting
15 from the turbine's blades beating under the stress of
16 the higher winds?

17 A. The turbine sound level would go up to
18 the values recorded from the IEC tests higher wind
19 speed.

20 Q. And the reason for that is because under
21 high winds, the blades tend to bend and creak and
22 groan?

23 A. No. No, it's just the aerodynamic noise.
24 Blades turning in the wind increase up to the rotor
25 until the rotor reaches full rpm, then the noise

1 stays the same.

2 Q. This is the swishing sound of the blades
3 turning in the wind?

4 A. No. This is the time averaged sound
5 level.

6 Q. Isn't it true that there are several
7 different types of sounds produced by wind turbines?
8 For different sources from the wind turbines that
9 produce those sounds?

10 A. Yes.

11 Q. Some sound comes from the blade turning
12 in the air; is that right?

13 A. Yes.

14 Q. Some sound comes from the hub or the
15 inner workings of the hub?

16 A. It can, yes.

17 Q. What was your L90 background level you
18 used at a speed of 5 meters per second for nighttime?
19 Go to page 27 of Exhibit K.

20 A. Thank you.

21 Q. And I believe you can also go to the
22 graph we were looking at or the figure we were
23 looking at earlier.

24 A. I'm sorry, and you were talking about
25 nighttime 5 meters per second?

1 Q. Yes, that's right.

2 A. To that was a background level of only
3 29. Very little.

4 Q. All right. So if you used 29 dB(A) as
5 your background sound level, that would establish a
6 design goal threshold of 34 dB(A) if you were
7 following the standard that you mentioned for
8 avoiding a difference between turbine noise and
9 background by more than 5 dB(A); is that right?

10 A. That's right, yeah.

11 Q. Now, if you were using the Leq to measure
12 your background noise levels, then at 5 meters per
13 second you would use a dB(A) of 38 from background;
14 is that right?

15 A. That's right.

16 Q. And that would establish a goal threshold
17 of 43 dB(A).

18 A. That's right.

19 Q. You say that the use of the L90 is the
20 worst case scenario I believe on page 10 of
21 Exhibit K?

22 Would you like to turn there?

23 A. Yeah, I call it, quote/unquote, worst
24 case because the L90 is the near minimum background
25 level. Measured under wintertime conditions in

1 addition.

2 Q. Go to page 11 of Exhibit K. Figure
3 2.5 -- I'm sorry, go to page 12, figure 2.5.2.

4 A. Okay.

5 Q. Now, this shows the sound that you
6 measured during your background noise survey between
7 January 11 and January 25, 2008, correct?

8 A. Correct.

9 Q. And this figure shows the noise levels
10 for the entire day during that time?

11 A. Yes.

12 Q. So it shows both nighttime and daytime
13 levels, right?

14 A. Yes.

15 Q. And generally speaking, the sound peaks
16 during the daytime and hits the valleys in the
17 nighttime, right?

18 A. There's a few nights when it goes down
19 but that's not consistent throughout all the survey
20 period.

21 Q. Generally speaking, noise levels go up
22 during the daytime because people are awake and
23 making noise, right?

24 A. In this instance it's largely because the
25 wind died down at night.

1 Q. Well, isn't it true that at least part of
2 the reason for it peaking and going down -- or, I'm
3 sorry, let me start over.

4 Isn't it true that during the daytime
5 part of the peaks of noise level are due to the fact
6 that people are making noise because they're awake?

7 A. Yeah. We set out to just determine what
8 the background level is irrespective of what's
9 causing it.

10 Q. Now if you look at this figure, I'd like
11 to direct your attention to all of the valleys in the
12 noise measurements below 29 dB(A). So everything
13 under -- you see the line for 30 dB(A)?

14 A. Right.

15 Q. So if you were to draw an imaginary line
16 for 29, that line would go just under the 30 line,
17 correct?

18 A. Right.

19 Q. And all of those measurements taken below
20 that line for 29 dB(A) would be measurements of noise
21 in which the noise level was less than your 29 dB(A)
22 threshold for background noise level, right?

23 A. Uh-huh.

24 Q. Yes?

25 A. Yes.

1 Q. All right. So there are considerable
2 amounts of time during most of the day in which the
3 sound levels were lower than 29 dB(A), right?

4 A. Through most of the survey period, yes.

5 Q. So if you are basing your recommendations
6 for how much noise the Board should allow the wind
7 turbines to impose on neighboring residents, if
8 you're using 29 dB(A) as the background noise level
9 and you allow the turbines to operate at a level
10 5 dB(A) above that, that would mean that every time
11 these noise levels dipped below 29, you were going to
12 have a differential exceeding 5 dB(A); isn't that
13 right?

14 A. Not necessarily. Because many of these
15 dips correspond to periods of very low wind and the
16 project may not even be operating. That's why we
17 correlate the sound levels to wind speed so that we
18 can apply them in a sensible way to the noise
19 produced by the project, which depends on the wind.

20 Q. You're assuming that during periods of
21 calm near the surface that the turbines will not be
22 operating?

23 A. That's right. Because the wind speed --
24 all this is based on is the wind speed measured at a
25 high elevation.

1 Q. But even if that assumption is correct,
2 there are going to appear to be periods of time in
3 which the background noise level is going to be less
4 than 29 dB(A) whereas the turbine noise produced in
5 the yards of various neighbors are going to exceed
6 34; is that right?

7 A. Yeah, there will be times when the
8 turbines are more audible than the case considered
9 for the model. And that's acknowledged in the text.

10 Q. And the reason for that is because
11 there's more than 5 dB(A) difference between the
12 turbine noise and the background noise.

13 A. Yeah, there's no question that that
14 situation is going to happen from time to time.

15 Q. Now go to page 17 please of Exhibit K.

16 A. Okay.

17 Q. Now, figure 2.5.8 shows the sound levels
18 when you use an Leq analysis, right?

19 A. That's right. I include the Leq here to
20 put the L90 in some sort of perspective. The L90
21 only happens for a short and small percentage of the
22 time. And much higher levels typically prevail and
23 that could be or that's represented here by the Leq.

24 It's just put in to show that the L90 is
25 not necessarily the typical background, it's the

1 background that happens during just lulls in the
2 wind, lulls in anything happening.

3 Q. Well, I think it's a good idea to compare
4 the two, so why don't we do that. Keep your finger
5 on 17 and go back to 11, which as we discussed
6 provides the L90 levels.

7 Now what the Leq does on page 17 is
8 flatten out those valleys below 29 dB(A); isn't that
9 right?

10 A. That just means that the average sound
11 level measured over every 10-minute increments was
12 significantly higher than 29. In fact, rarely went
13 below 30.

14 Q. And what Leq analysis does is disguise
15 the fact that you had all of these readings below
16 29 dB(A) as reflected in the L90 analysis on page 11;
17 isn't that correct?

18 A. It's not intended to disguise anything.
19 That's why we talk about the L90 to such an extent in
20 this report.

21 As I said, we're just putting the Leq in
22 there to provide some kind of perspective to show
23 that, look, lot of times the sound level's quite a
24 bit higher.

25 Q. But the appropriate background noise

1 level to use for your analysis to determine how much
2 noise the Board should allow from these turbines
3 should be based on the L90 instead of Leq, correct?

4 A. Oh, yeah, I agree with that.

5 Q. Isn't it true that the Leq is the poorest
6 formula for measuring sound in quiet areas?

7 A. I wouldn't describe it that way. It's
8 the actual average level that that occurred.

9 Q. I'm going to hand you what has been
10 marked as UNU Exhibit 62.

11 (Exhibit marked.)

12 Q. You remember this document, don't you?

13 A. Sure do.

14 Q. Paper written by your dad?

15 A. Yep.

16 Q. Has Hessler Associates' name on the top
17 of it?

18 A. Yep.

19 Q. I'd like to direct your attention to the
20 third page of that document. I'm sorry, let's just
21 start with the first page.

22 Go to the third sentence. We see where
23 it says in the abstract this paper "is suggested that
24 LA50 may be the most informative while LAeq is the
25 poorest metric for measurement in quiet areas."

1 A. Yeah, I see that.

2 Q. And you would regard the Buckeye Wind
3 project area as being a quiet area, wouldn't you?

4 A. Yeah.

5 Q. Now go to the third page of this
6 document. Third sentence and the fourth sentence.
7 "LA10 and LAeq are poor metrics for the interval and
8 are controlled by the energy from the two auto
9 passes. LAeq would reduce by 5 dB(A) if the autos
10 had not passed while LA50 and LA90 would not change
11 materially."

12 Now, this goes back to what you stated
13 earlier in your testimony about how vehicles passing
14 can skew the results of Leq, right?

15 A. Sure.

16 Q. And go back to the last page of the
17 document on the conclusions. And the first and
18 second sentences say "It is shown that LAeq is not a
19 good metric for quantifying levels in a quiet
20 environment, at least if the data is to be used for
21 noise impact studies. LA50 and LA90 are better
22 metrics."

23 See that?

24 A. Yes.

25 Q. So in light of what your father has

1 written in this paper, do you believe that the Leq is
2 a poor formula for measuring sound -- background
3 sound in quiet areas?

4 A. As I said, I just put that in for -- to
5 give the L90 some kind of perspective in context.
6 Obviously we've modeled the impacts based on the L90
7 as well and that's where I put most of my emphasis on
8 when valuating the impact of the project.

9 If we were to use the Leq by itself,
10 which I know is done by other engineers, that would
11 come out with a much -- that would be a poor
12 methodology.

13 Q. What made you decide to use 5 dB(A) above
14 background as your design goal?

15 A. That's a very common design approach.
16 It's used all the time for conventional power plants.
17 It's been used for many years. It's in standards in
18 the U.K., guidelines in New York State, number of
19 other places.

20 The reason is a sound that's 5 above the
21 background is the point where it just begins to be
22 noticeable to most people.

23 Q. I believe that you stated that the LA90
24 noise level would be noticeable only during lulls in
25 the background noise.

1 A. Right.

2 Q. How long are these lulls that you're
3 speaking of?

4 A. It could just be a few seconds long.
5 Typically they are. The longest, at the longest
6 they're going to be a minute.

7 Q. But at any typical background noise level
8 you're going to have many of those lulls; is that
9 right?

10 A. Yeah, over a 10-minute period you could
11 have ten times when it goes down to this level, if
12 only briefly.

13 Q. And what interrupts the lulls?

14 A. Any puff of wind, anything happening, any
15 tractor in the distance, any number of things, plane
16 flying over.

17 Q. And those interruptions in the lulls are
18 going to decrease at night, right?

19 A. Well, we found that the L90 level was
20 lower at night, yes.

21 Q. Let's talk about your statement that
22 wind -- when the air is calm near the surface, the
23 wind turbines are not going to turn.

24 Please go to page 14 of Exhibit K. I'd
25 like to direct your attention to the sentence under

1 figure 2.5.4, which says "This plot shows that the
2 near-minimum L90 background sound levels over the
3 site area are clearly related to wind speed and
4 largely driven by wind-induced sounds, although an
5 underlying diurnal, or day-night, variation is also
6 visible where it has brief minimum in the early
7 morning hours on most days."

8 What's the meaning of your reference to
9 the underlying diurnal or diurnal variation?

10 A. That goes to your observation that a lot
11 of times at night the levels went down low. So that
12 was happening at the same time as the levels were
13 being substantially driven by wind, wind sounds.

14 Q. Now go to page 20 of Exhibit K. I'd like
15 to direct your attention to the second to last
16 paragraph on that page. The last sentence where it
17 says "It should be understood that the shape of this
18 curve can certainly vary from this norm during
19 temperature inversions and other atmospheric
20 conditions that occur a small percentage of the time.
21 But as a design condition this curve reasonably
22 captures the wind speed profile during most normal
23 conditions."

24 What do you mean by your reference to
25 temperature inversions?

1 A. When the temperature in the atmosphere is
2 warmer above the surface than it is near the ground,
3 that sometimes develops in the evening or at night.
4 Changes the way sound propagates through the air.

5 Q. What's the result of that phenomena?

6 A. It tends to enhance the propagation of
7 sound. So what I'm saying here is there's going to
8 be times when the atmospheric conditions favor the
9 propagation of noise from the turbines to -- in a
10 given location and the lulls are going to go up.
11 There's no rigorous way of calculating that. So I
12 just state it.

13 Q. Isn't it true that during temperature
14 inversions you will have high wind speeds at hub
15 height even though you have calm or near calm wind
16 conditions near the surface?

17 A. No. No, actually temperature inversions
18 require light wind conditions or else the atmosphere
19 gets stirred up like creamer in a coffee. For that
20 to happen winds have to be fairly calm and the
21 project might not be running.

22 The phenomenon you're referring to is
23 sometimes at night the wind can stratify and be
24 higher, and higher elevation than it is at the
25 ground. No question that happens.

1 Q. Okay. And how often does that happen?

2 A. That is a site specific thing and I don't
3 know for this site or any site.

4 Q. It's not a rare occurrence, is it?

5 A. I wouldn't describe it as common either.

6 Q. Are you familiar with an acoustic
7 engineer named Clifford Schneider?

8 A. That sounds vaguely familiar. I really
9 don't know though.

10 Q. Let me hand you a paper that he authored.
11 And maybe that will refresh your recollection as to
12 who he is. I'm going mark this as UNU Exhibit 63.

13 (Exhibit marked.)

14 Q. Does Exhibit 63 refresh your memory that
15 Clifford Schneider is an acoustical engineer formerly
16 with the New York State Department of Conservation?

17 A. No, it doesn't refresh anything. First
18 time I've seen this.

19 Q. You'll see in the first sentence of the
20 abstract that this is a study about the Cape Vincent,
21 New York wind farm. See that?

22 A. Yes, I do.

23 Q. Now, you know all about that wind farm,
24 don't you?

25 A. Yes, I do.

1 Q. This is one of the wind farms that was
2 modeled for -- to predict the noise levels by Hessler
3 Associates?

4 A. There's actually two projects right next
5 to each other. Are you referring to a specific one?

6 Q. I believe that it's referred to as the
7 St. Lawrence wind farm. Look at the abstract.

8 A. As I skim down it looks like they're
9 talking about both projects here.

10 Q. If you could go to page 2 of this
11 document, I'd like you to look at a few sentences on
12 this page.

13 Look at the second sentence on the page
14 where it says "Swedish and Dutch residents who live
15 near wind farms describe wind turbine noise as much
16 louder and more perceptible during evenings and
17 night, and they also reported excessive noise
18 annoyance was associated with sleep disturbance. In
19 a study of noise immissions from the Rhede Wind Park
20 along the Dutch-German border, most of the complaints
21 about noise focused on evenings and nighttime, and
22 the wind turbine noise was found to be greater than
23 predicted due to stable atmospheric conditions."

24 Now, let me ask you this, are you aware
25 of complaints that have been made about the noise

1 coming from the Cape Vincent wind farm that Hessler
2 Associates modeled?

3 A. No, because neither of those projects has
4 been built.

5 Q. So you modeled a project in Cape Vincent
6 that was not built yet?

7 A. Right.

8 Q. Who built these projects, do you know?

9 A. Well, it says here in the paper, Acciona
10 and BP.

11 Q. Yeah, but do you know which acoustic
12 engineers did the modeling work for these developers?

13 A. I did the modeling work for Acciona.

14 Q. So you did the modeling for one of the
15 wind farms discussed in this paper?

16 A. That's correct.

17 Q. Now continuing to read on that page, it
18 says "Stable atmospheric conditions occur when land
19 begins to cool with a setting sun and calm ground
20 level winds become de-coupled from winds aloft."

21 This is the condition that you and I have
22 just been discussing, right?

23 A. Yeah.

24 Q. And then it says "Calm winds at ground
25 level provide no masking sounds thereby making wind

1 turbine noise more noticeable. The term worst case
2 has been commonly used by New York wind developers
3 modeling noise impacts. Yet, in none of their
4 assessments have they completed an analysis of noise
5 impacts during evenings and nights with stable
6 atmospheric conditions, when wind turbine noise will
7 be most noticeable and the worst-case impact will
8 occur."

9 You see that?

10 A. Yes.

11 Q. So Mr. Schneider refers to these
12 conditions as being the worst-case impact from wind
13 turbine noise; isn't that right?

14 MR. SETTINERI: Objection. The witness
15 has never seen the document. He can only testify
16 what's written in the document. He's not read the
17 whole document either. The question appears to be
18 detailed information about what Mr. Schneider
19 believes.

20 MR. VAN KLEY: I'll withdraw the
21 question.

22 ALJ STENMAN: Okay.

23 Q. Page 4 please. Do you see in the top of
24 that page that Mr. Schneider collected his noise data
25 using the A-weighting formula?

1 A. Yeah, I see it says that in that first
2 sentence.

3 Q. Now go to page 5 of this document please.
4 Just above table 2 the sentence reads "In June and
5 July, wind turbine noise would have been more
6 problematic with worst-case conditions occurring more
7 than 40 percent of summer nights."

8 You see that?

9 A. Yes.

10 Q. Let me direct your attention to table 2.
11 Do you see those statistics from Mr. Schneider's
12 study?

13 A. Yes.

14 Q. And you'll see that for worst-case
15 conditions there were nine days in June that in
16 which -- let me back up a little bit.

17 Go to the heading for table 2. You see
18 the second sentence where he defines worst-case
19 conditions?

20 A. Yes.

21 Q. Says "Worst-case conditions were those
22 stable nights with calm ground level winds less than
23 2 meters per second and hub-height winds at or above
24 cut-in speed more or equal to 4 meters per second."

25 Given that definition then you will see

1 that in table 2 he identifies the number of days each
2 month where he measured worst-case conditions; is
3 that right?

4 A. I believe that's what this is all about,
5 yeah.

6 Q. And if I'm reading this chart correctly,
7 he found that in June there were nine days with that
8 condition; is that right?

9 MR. SETTINERI: Object again as the
10 question's posed. The witness can testify about
11 what's written here but he's asking for a conclusion
12 as to what Mr. Schneider found.

13 MR. VAN KLEY: No, your Honor, I'm asking
14 what it says.

15 Q. Does it say that Mr. Schneider found
16 worst-case conditions on nine days during June?

17 ALJ STENMAN: Just a second, Mr. Van
18 Kley.

19 Mr. Hessler, if you know, you can answer
20 the question. But if this is unclear for any reason,
21 feel free to say you don't know.

22 A. No, I see here that nine nights there was
23 a stability condition in D.

24 Q. And if you read all the way across that
25 line you will see between June and October the chart

1 shows that worst-case conditions occurred
2 29.6 percent of the time; is that right?

3 A. Which month is that now?

4 Q. The total for June to October. On the
5 right-hand column.

6 A. 29.6 percent you're looking at?

7 Q. Yes.

8 A. Okay. All right.

9 Q. So according to this data, worst-case
10 conditions according to Mr. Schneider occurred almost
11 one of every three nights from June to October; is
12 that correct?

13 A. Well, the stability class D, for
14 instance, is only slightly stable and he's clumping
15 that in. I wouldn't call that worst case.

16 Q. But certainly it would still lead to the
17 condition that we've been discussing where you have
18 near calm wind levels at the surface but have wind
19 levels at hub height that can still turn the
20 turbines; isn't that right?

21 A. Yeah, you're assuming that. I don't
22 believe that happens. I never said that.

23 Q. Then go to page 9 of this document under
24 "Discussion Conclusions." The last sentence on that
25 page states "Therefore, worst-case wind turbine noise

1 impacts will occur at night with stable atmospheric
2 conditions, and consequently, environmental
3 assessments should focus on these worst-case
4 conditions."

5 See that?

6 A. Yes.

7 Q. That's not what you did in your model for
8 Buckeye Wind, is it?

9 A. If we were to evaluate these conditions,
10 I think it would overestimate the project sound level
11 the majority of the time. So I think the approach
12 we've taken is reasonable.

13 Q. But your approach underestimates the
14 noise impacts during the times where you have these
15 conditions; isn't that correct?

16 A. Yeah, we predict the sound level that we
17 think is going to happen most of the time and then
18 acknowledge that these kinds of phenomena certainly
19 do occur from time to time.

20 Q. Now go to page 11 of this document
21 please. I'd like to direct your attention to table
22 7.

23 Earlier in your testimony you mentioned I
24 think, or maybe Exhibit K mentioned the New York
25 standards for noise impacts. Is it true that

1 Exhibit K mentions these standards?

2 A. No, it doesn't.

3 Q. It does not? You're aware of them
4 though, aren't you?

5 A. Yeah. I mentioned them in passing a
6 couple minutes ago.

7 Q. Now, are you familiar with table 7 from
8 those standards?

9 A. No, I'm not familiar with this table and
10 I don't recognize that as coming from the New York
11 DEC.

12 Q. We'll move on then.

13 I'd like to direct your attention to
14 plots 2C and 2D which are at the end of Exhibit K.

15 A. All right.

16 Q. These two plots are based on your model;
17 is that correct?

18 A. These are the result of the model
19 calculation, yes.

20 Q. Directing your attention to 2C, this plot
21 is based on the design goal of 34 dB(A); is that
22 correct?

23 A. It's based on the nominal impact
24 threshold where the sound level's expected to go 5
25 above the background level at 34. So that inside of

1 that contour levels of 5 or more above the background
2 are being predicted here.

3 Q. So for this particular plot you used the
4 background noise level of 29 dB(A); is that right?

5 A. Right.

6 Q. You add 5 dB(A) to that and you come up
7 with 34 dB(A) design goal, right?

8 A. Right.

9 Q. And this is for nighttime conditions?

10 A. That's correct.

11 Q. And it's based on a 5-meter per second
12 wind speed; is that right?

13 A. Right.

14 Q. So in situations where the wind speed is
15 higher than 5 meters per second, if you have one of
16 those days described by Mr. Schneider where the wind
17 speed is near calm at the surface and the turbines
18 are turning above or at hub height, these contours
19 are not going to accurately reflect the level of
20 noise being experienced by the homes shown on this
21 plot; is that correct?

22 A. The predicted sound levels here are based
23 on the turbines operating in 5-meter per second wind.
24 They're independent of what the background level
25 might be. The only way that factors in is in the

1 threshold contour of 34 here.

2 Q. Going back to my question, isn't it true
3 that if we had the conditions described by
4 Mr. Schneider, these contour lines for 34 dB(A) would
5 have to be pushed further away from the turbines?

6 A. Yeah, your theoretical L90 plus 5 design
7 threshold would move out, but I should point out that
8 once the levels get down in this neighborhood of 34,
9 those levels are so quiet that it doesn't really
10 matter what the background level is anymore, they're
11 kind of fading down to nothing.

12 Once a level of 30 is reached, it doesn't
13 matter whether there's any masking or not. Even if
14 there's zero masking there's very good possibility
15 that there will be no adverse impact from it.

16 Q. But you're assuming that at 5 dB(A) above
17 background, that is your design goal because that is
18 the point at which people start to notice the wind
19 noise, right?

20 A. Uh-huh.

21 Q. And the higher the noise level gets, the
22 more they are likely to notice that turbine noise; is
23 that right?

24 A. You'll have to restate that.

25 Q. Yeah. As the wind turbine noises grow

1 larger or grow louder than 34 dB(A), the people
2 living around the facility are going to notice that
3 noise to a greater extent.

4 A. Yes, that's correct.

5 Q. And in fact, if you have one of those
6 conditions where the wind turbines are operating at
7 hub height even though the winds near the surface are
8 near calm, then the assumptions that you have made
9 for purposes of this model that the surface wind
10 noise is going to mask the turbine noise is no longer
11 valid; isn't that right?

12 A. The sound levels would stay the same as
13 predicted here. The contours wouldn't change. It's
14 just if the background level drops away then
15 there's -- there would be a greater perceptibility
16 under those conditions of the sound.

17 Q. If what background drops away?

18 A. If the background sound level was
19 minimal, that would increase the perceptibility of
20 the turbines.

21 Q. You modeled this based on a 5-meter per
22 second wind speed for a reason, did you not?

23 A. Yeah.

24 Q. And the reason for that as you've
25 explained it to us is that you're making the

1 assumption that at 5 meters per second the wind speed
2 near the surface is going to have a certain masking
3 affect on your ability to hear that wind turbine
4 noise.

5 A. Right. And that's what we found in the
6 survey. That's why we're reporting it that way.

7 Q. And isn't it true that the contours on
8 this map plot in 2C take that masking into account?

9 A. Only in the extent that the threshold
10 would be at 34. Sound level of the turbines would be
11 unaffected.

12 Q. Well, let me ask the question this way
13 then, let's assume that you did have a condition in
14 which the wind speeds near the surface were near calm
15 but the wind turbines were still turning in
16 conditions where the wind speed was 5 meters per
17 second normalized to 10 meters at hub height.

18 A. All right.

19 Q. Where would the 34 dB(A) contours be on
20 this map under those conditions?

21 A. Well, the threshold for 5 dB, perceptible
22 increase would be beyond 34.

23 Q. And where would those contours be? How
24 far out would that push the contours?

25 A. Well, there's no way of calculating what

1 that would be. It's known that under those kinds of
2 conditions the turbine sound level can propagate more
3 easily and be more perceptible, but there's no
4 methodology out there for calculating that or
5 determining a specific threshold level.

6 All I could say is that under those
7 conditions there might be greater impact than they're
8 depicting here.

9 Q. Now, assuming the same conditions that
10 we're discussing, what would the sound level be on
11 the contours that you have drawn for 34 dB(A) on this
12 map? What would the sound actually be at in those
13 areas?

14 A. The sound would actually be 34 on the 34
15 contour here.

16 Q. No, take the label for 34 off the contour
17 but leave the contour there.

18 A. Yeah.

19 Q. Inside of that area what would the noise
20 levels be?

21 A. I think this is the same question again.
22 The sound levels would be the same. It would be 40
23 where the 40 line is and 34 where the 34 line is
24 shown. It would be different --

25 Q. Let me ask you this then, within that

1 area that is currently shown by the 34 dB(A) contour,
2 what would be the differential between background and
3 the wind turbine noise?

4 A. Greater than 5.

5 Q. How much greater?

6 A. That depends on what the background level
7 is under those conditions you're talking about. We
8 don't know what that is.

9 Q. So you can't predict how high the levels
10 would be in those areas in a condition where the wind
11 near the surface are near calm but the turbines are
12 still operating at hub height.

13 A. We can't calculate a specific value for
14 the differential between the background and the
15 project point.

16 Q. Plot 2D provides the same type of
17 information but just the other half of the project,
18 right?

19 A. Right.

20 Q. Are plots 2C and 2D based on L90
21 measurements or Leq measurements?

22 A. The L90 background.

23 Q. Because I don't see that on here
24 anywhere, do you?

25 A. It's not actually on the figure but it's

1 talked about in the discussion in the text.

2 Q. Now, I take it from your earlier
3 testimony that for none of these turbines did you
4 provide contours based on those turbines being line
5 source turbines.

6 A. They're all modeled as point sources
7 here.

8 Q. If any of these were modeled as line
9 sources, the contours would extend further out,
10 wouldn't they?

11 A. Well, we talked about this before. The
12 turbines you're talking about are in the western part
13 of the site on plot 2C where they're arranged in
14 rows.

15 These turbines are a thousand feet
16 roughly apart from each other. They're radiating as
17 point sources because they're not coherent sources.
18 They would not form up into a line source. That's
19 impossible.

20 Q. Were you aware that Mr. Shears testified
21 in this hearing that it was his understanding that
22 some of the turbines were modeled as line sources?

23 A. I have no knowledge of that.

24 Q. Going back to my question about the line
25 sources, isn't it true that if any of these turbines

1 were modeled as line sources the contours would
2 extend a longer distance away from the turbines?

3 A. Yes, the contours would -- for a given
4 value they'd be further from turbines, but that is
5 not the case here.

6 Q. Now, the way these contours are drawn,
7 for example, the 34 dB(A) contour, that means that
8 every receptor inside of that 34 contour line has
9 been modeled to receive at least 34 dB(A) during
10 nighttime conditions assuming a 5-meter per second
11 wind; is that right?

12 A. Yeah. The project level at any given
13 point inside of that contour would be some value
14 higher than 34. And the increase over the background
15 would be higher than 5.

16 Q. Now, given all the assumptions of your
17 model, how high are the noise levels that are going
18 to be reached with respect to the homes inside of
19 those contours?

20 A. Well, the vast majority are outside of
21 the 40 contour. They're in the 30s. The high 30s is
22 a fairly quiet sound level. In the 40s is typically
23 regarded as the point where below which there's no
24 issues with sleep disturbance or anything of that
25 nature.

1 40 is actually the very low level.
2 There's very few houses that are inside of 40, and
3 that was the result of many iterations and changes to
4 the site plan to try minimize the noise impact. The
5 working goal was to attempt to get all houses outside
6 of 40.

7 Q. So all of those homes between the contour
8 for 34 and the contour for 40 will experience noise
9 levels between 34 and 40 dB(A).

10 A. Right.

11 Q. And that means that all of those homes
12 are going to experience noise levels that are more
13 than 5 dB(A) above background.

14 A. Yeah. Above the background, above the
15 L90 background.

16 Q. Which as you have stated today is your
17 design goal, and rightfully so. Haven't you told us
18 that?

19 A. That's correct. That's why we say with
20 respect to this plot that there's a lot of homes in
21 here where we expect the sound from the -- probably
22 to be very clearly audible and potentially annoying.

23 However, levels in the 30s just on an
24 absolute basis are very low and seldom result in very
25 many complaints.

1 Q. But that was not the design goal that you
2 attempted to meet was it?

3 A. As I said, the working goal was 40 and
4 the impact threshold that we were discussing in the
5 report was the L90 plus 5.

6 It's very rare for any project of this
7 nature to have predicted levels of L90 plus 5 or to
8 have every house outside of that threshold. I can
9 only think of two projects out of 50 where that's the
10 case.

11 The common situation is to have -- is to
12 be or not have enough elbow room, so to speak, to
13 have all the houses outside of that threshold.
14 That's an ideal design goal but it's not generally
15 practical to achieve that.

16 You need a completely uninhabited and
17 remote site for that. So all we can say here is that
18 we're expecting the project to be very clearly
19 audible under these nighttime minimum background
20 level conditions, and that could lead to complaints.

21 Q. I'd like you to look at Exhibit 47. That
22 would be UNU Exhibit 47. You should have them in
23 that stack on the front of your chair there.

24 MR. VAN KLEY: Your Honor, could I have
25 just a moment to look for something here. I'm almost

1 ready to wrap up but I've lost something.

2 ALJ STENMAN: While you're wrapping up
3 what does everyone else anticipate for
4 cross-examination? Starting with Ms. Napier? In
5 terms of time.

6 MS. NAPIER: I may have, to be realistic
7 and tell you that probably tonight it will be longer
8 than if it was tomorrow and I'm a little fresher, but
9 I'd probably say about 45 minutes.

10 MR. BROWN: Five minutes.

11 MS. FLAHIVE: I have no questions.

12 MR. MARGARD: Question or two.

13 ALJ STENMAN: And will Mr. Hessler be
14 available if we wait until morning? Is that an
15 issue?

16 MR. SETTINERI: We would need a break
17 shortly to rearrange some travel plans to do that
18 but, yes. The answer is yes.

19 MR. MARGARD: When is Mr. Dye?

20 ALJ SEE: We can go off the record.

21 (Off the record.)

22 ALJ STENMAN: Let's go back on the
23 record.

24 BY MR. VAN KLEY:

25 Q. Before we took our break I had provided

1 you with Exhibit 47. Do you have that in front of
2 you?

3 A. Yes, I do.

4 Q. Now, this is a document that Dr. Mundt
5 introduced into our discussions earlier in this
6 proceeding and he identified that as a study by
7 Pedersen. Are you familiar with this study?

8 A. Somewhat. I'm more familiar with --

9 Q. Do you recognize Pedersen as someone
10 who's experienced with acoustic engineering?

11 A. Yes.

12 Q. And by virtue of your reading various
13 articles by Pedersen, do you regard Pedersen as
14 someone who is respected in the field of acoustic
15 engineering?

16 A. Yes.

17 Q. I'd like to direct your attention to page
18 3468 of this document. In particular I'd like you to
19 look in the upper left-hand corner at that figure.

20 A. Right.

21 Q. Now, you'll see on the left side there is
22 a measurement of percentage of highly annoyed people.
23 Do you see that?

24 A. Yes.

25 Q. At the bottom you will see the sound

1 levels, correct?

2 A. Right.

3 Q. So this table measures the degree to
4 which a certain percentage of the population is
5 highly annoyed by wind turbine noise and aircraft
6 noise and road traffic noise and railway noise; is
7 that right?

8 A. Right.

9 Q. And you will see that at levels between
10 34 dB(A) and 40 dB(A) the percentage of the
11 population that is highly annoyed ranges between
12 5 percent and 35 percent; is that correct?

13 A. Yes.

14 Q. Now, do you believe that it would be
15 consistent with the standards for practices that
16 you're experienced with in the field of acoustical
17 engineering to have between 5 and 35 percent of the
18 persons exposed to wind farm noise that is produced
19 by wind turbines that you have modeled?

20 A. I would agree with this chart, which is
21 why we do not say that no one will be annoyed with
22 this project if it were to go ahead.

23 Q. So if you agree with this figure, then
24 you would also agree that between the contour lines
25 of 34 and 40 in plots 2C and 2D there will be between

1 5 and 40 percent of those people, depending on the
2 noise levels, who will be highly annoyed by this
3 project.

4 A. That is a possibility, yes.

5 Q. Let me introduce another document here.
6 I'm looking at your direct testimony, answer 7 where
7 you discuss a letter from Richard James filed in Ohio
8 Siting Board Case on 08-1028-EL-ORD.

9 ALJ SEE: Let me correct the record.
10 That's case No. 08-1024.

11 MR. VAN KLEY: Okay. Thank you, your
12 Honor.

13 I'm going to mark a document as
14 Exhibit 64.

15 (Exhibit marked.)

16 Q. Have you had an opportunity to review
17 this document?

18 A. Yes, I have.

19 Q. Is this the document to which you are
20 referring in your answer A7 in your testimony?

21 A. Yes.

22 Q. For this next question I'd like you to
23 make a number of assumptions. First of all I want
24 you to assume that your background noise measurements
25 were accurate, even though you attached the

1 microphones to poles and posts.

2 I want you to assume that your background
3 noise measurements were accurate, even though you
4 placed the microphones near wires.

5 I would like you to assume that your
6 model is accurate, even though the actual model may
7 have differed from operating levels by 5 dB(A).

8 I want you to assume that it was
9 appropriate to use the coefficient of .5 dB(A), to
10 assume that there was ground absorption of noise,
11 even under conditions in which you have frozen
12 ground.

13 I want you to assume that your model is
14 accurate, even though you failed to model the
15 noisiest turbine being considered by Buckeye Wind.

16 I want you to assume that your model is
17 accurate, even though some percentage of the time
18 that wind speeds exceed 5 meters per second or
19 6 meters per second.

20 I want you to assume that your model is
21 accurate, even though you did not model any of the
22 turbines as line sources.

23 Now, taking all of those assumptions as
24 being true, how many homes are going to be exposed to
25 noise levels from Buckeye Wind's turbines that exceed

1 the 5 dB(A) differential between background noise and
2 turbine noise?

3 MR. SETTINERI: Your Honor, we'll object.
4 I don't object to assumptions but the excessive
5 testimony by counsel. So we object to the question
6 in its entirety and request it to be struck or
7 rephrased.

8 MR. VAN KLEY: Your Honor, I think it
9 reflects what he's testified to today. I have asked
10 him to assume that he did everything right despite
11 all the testimony we've heard today.

12 And given those assumptions, I'm simply
13 asking him if all those assumptions are true, how
14 many people or how many homes are going to be exposed
15 to more than 5 decibels above background.

16 ALJ STENMAN: We note the objection for
17 the record but the question's been posed, so please
18 go ahead and answer. If you can.

19 A. Under the conditions when the background
20 level is at a near minimum, which theoretically
21 happens only 10 percent of the time, there would be a
22 large number, I don't know how many, but the houses
23 that are encircled by this 34 contour.

24 Q. (By Mr. Van Kley) Well, if you look at
25 plots 2C and 2D, you will see that the red dots

1 depict homes and other structures; is that right?

2 A. That's correct.

3 Q. So if you counted all of those little red
4 dots, you would come up with a total number of homes
5 and other structures that would be exposed to noise
6 levels exceeding 5 decibels above background.

7 A. That's correct.

8 Q. And in fact, there are blue dots also
9 depicted that are structures; is that correct?

10 A. That is correct. Not all of these dots
11 are actually homes. There are some -- I believe some
12 of them are barns and outbuildings and so forth.

13 Q. But you have not made an attempt to
14 differentiate between the two.

15 A. We have not made an attempt. It would
16 take an on-the-ground survey to figure out which ones
17 are actually houses. But we believe most of them are
18 houses.

19 Q. What is the distance between the turbines
20 as modeled in 2C and 2D from the 34 dB(A) contour?

21 A. Well, there's no single setback number.
22 It depends on the arrangement of the turbines.

23 Q. Can you give me a range of distances
24 between the 34 contour and the turbines?

25 A. I think as a minimum it would be on the

1 order of a little under a thousand meters.

2 Q. Would it surprise you to learn that there
3 are more than 475 homes and other structures inside
4 of the 34 dB(A) line?

5 A. Not at all.

6 MR. VAN KLEY: Thank you. No further
7 questions.

8 ALJ STENMAN: With that we'll conclude
9 for the evening and let's go off the record.

10 (Off the record.)

11 (Hearing concluded at 6:20 p.m.)

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CERTIFICATE

I do hereby certify that the foregoing is a true and correct transcript of the proceedings taken by me in this matter on Thursday, November 12, 2009, and carefully compared with my original stenographic notes.

Julieanna Hennebert, Registered
Professional Reporter, and
Notary Public in and for the
State of Ohio.

My commission expires February 19, 2013.

(JUL-1490)

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