In The Matter Of:

McLEAN COUNTY ZONING BOARD OF APPEALS MEETING

WIND FARM

January 4, 2018

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McLEAN COUNTY ZONING BOARD OF APPEALS

MEETING

Thursday, January 4, 2018

6:00 p.m.

at

Heartland Community College

1500 West Raab Road

Normal, Illinois

Case Number SU-17-11

ZONING BOARD MEMBERS PRESENT:

Brian Bangert
Chris Carlton - 1st Alternate
Rick Dean
James Finnigan - Chairman
Michael Kuritz
Mary Beth Taylor - 2nd Alternate
Julia Turner
Drake Zimmerman

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APPEARANCES:

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On Behalf of McLean County.

ALSO PRESENT:

PHILIP DICK, Director of Building & Zoning

JERRY STOKES, Assistant County Engineer

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I N D E X

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MR. FINNIGAN: We're going to call the meeting to order tonight. This is a continuation of Invenergy's case -- I got to get the number here -- SU-17-11 from Tuesday night. It was continued to tonight at 6:00.

Where we're at in this process, if you follow this and as you pick one up and come in, is the first paragraph. The Applicant is still putting on their witnesses, and every witness they have can be asked questions at this point.

So you'll have a chance to come back later to give testimony, stuff like that. That's where we are at this point. As long as there's no questions, we're going to call the roll and continue on.

MR. DICK: Mark Judd?

(No response.)

MR. DICK: Brian Bangert?

MR. BANGERT: Here.

MR. DICK: Michael Kuritz?

MR. KURITZ: Here.

MR. DICK: Rick Dean?

MR. DEAN: Here.

MR. DICK: Julia Turner?

MS. TURNER: Here.

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MR. DICK: Drake Zimmerman?
MR. ZIMMERMAN: Here.
MR. DICK: Jim Finnigan?
CHAIRMAN FINNIGAN: Here.
MR. DICK: Chris Carlton?
MS. CARLTON: Here.
MR. DICK: Mary Beth Taylor?
MS. TAYLOR: Here.
CHAIRMAN FINNIGAN: We have a quorum; so we can conduct business. The staff has been affirmed, and I think we're ready to ask for our next witness.

If it goes past tonight, we are going to continue this to Tuesday night at the Law and Justice Center -- Government Center -- that's what I meant -- where we always meet. That will be at 7:00. So that will be our next meeting if we do not get done tonight. We'll announce that again at the end in case people come in late. Tonight will not go past 10:00.

MR. ZIMMERMAN: If we meet Tuesday, will it be 6:00 again?

CHAIRMAN FINNIGAN: 7:00. Are we ready? I think we're ready for the next witness.

MR. GRIFFIN: Thank you, Mr. Chairman. Before we call the next witness, I do have a number of

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exhibits that I want entered into the record. I believe the Board has copies of those, but I'd like to go through those briefly, if I may.

The first would be Applicant's Exhibit Number 6. This is a letter from the Project to Mr. Dick and to the County responding to the IDNR consultation letter. That letter is dated January 4, 2018. I would ask that be entered into the record as Applicant's Exhibit Number 6.

The next document we have that I ask be entered into the record is Applicant's Exhibit Number 7. It is a one-page document that is correcting the parcel identification information for two of the participating parcels in the project. The correct information was provided in the public notice that was published and mailed, but there was some incorrect information that was provided in the application. Again, these parcels were both identified, but some of the legal descriptions for them were not correctly distinguished between the two parcels. So I'd ask that that correction be entered as Applicant Exhibit Number 7.

Next we have Applicant Exhibit Number 8, which we'd ask to be entered. This is a revised

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Decommissioning Plan and Decommissioning Obligation Cost Evaluation.

As you may recall from Tuesday's hearing, the gentleman from the Farm Bureau pointed out that the Decommissioning Plan that had been submitted in the application was based upon the requirements in the County Ordinance. Subsequent to that being filed, we entered into the Agricultural Impact Mitigation Agreement with the Department of Agriculture. That provided some slightly different decommissioning requirements, including removal of the foundation to a greater depth for the wind turbines to a five foot depth.

So we had our decommissioning consultant revise their study, and that's Applicant's Exhibit Number 8. You will note that the per turbine decommissioning cost increased to $52,809, and that would be what we would propose to post as security as a per turbine decommissioning security amount. So that increased.

Finally, Applicant's Exhibit Number 9 that we would ask to be entered is correspondence from the Illinois Department of Natural Resources Historic Preservation Office which is responding to

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correspondence from the Applicant concerning the project. It's dated December 14, 2017, and simply asks that the -- this is the Department asking -- that the project continue with the consultation process, which we are doing.

So I'd ask that those be entered into the record. And certainly if there are questions about those documents, we'd be prepared to answer those tonight. If they are not any, we're ready to call our next witness.

CHAIRMAN FINNIGAN: I think we're fine with the exhibits; so you can bring your witness, and we'll swear him in.

MR. GRIFFIN: Very good. Our next witness is Mr. Michael Hankard. He is sitting here next to me, and he's ready to be sworn in. He also has a PowerPoint presentation that goes along with his testimony.

(Michael Hankard sworn.)

CHAIRMAN FINNIGAN: Would you state your name and address.

MR. HANKARD: My name is Michael Hankard. My address, business address, is 211 East Verona Avenue in Verona, Wisconsin.

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MR. DICK: Could you spell the last name, please?
MR. HANKARD: H-a-n-k-a-r-d.
MS. TURNER: Do we have this exhibit in our book?
MR. ZIMMERMAN: This one. It's a new one.
MR. GRIFFIN: If we could get the PowerPoint presentation up, please?
Mike, go ahead and introduce yourself and identify yourself first.
MR. HANKARD: Sure, but that messes with my flow. I was going to get into my credentials in a little bit.
All right. My name is Mike Hankard. I am a noise control engineer or acoustician whose profession it is to measure and analyze, predict and research and testify on noise from industrial sources such as wind turbines.
I'm here tonight to describe the results of the study that I conducted which shows that, when operational, the McLean Wind Energy Center, the noise from it, will be in compliance with the Illinois Pollution Control Board regulations, which is what the County Zoning Ordinance requires.

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There's some technical jargon and terms and whatnot that we have to cover tonight. I'm going to do my best to simplify that. I'm here to provide you with a framework to understand this, not to befuddle you with numbers and what have you. If at any time I'm not being clear and you need a little more explanation, feel free to let me know.
For those of you with the PowerPoint in front of you, if you could turn now to -- well, it's the second slide, the first one after my introduction. For the audience who doesn't have the benefit of this, we'll be coming back to this slide a couple of times; so you're not completely missing any ground yet.
This chart shows you the nighttime noise limits of the Illinois Pollution Control Board. Some of you may or may not be familiar with this. Illinois has a little bit more of a robust and complex noise standard. A lot of times you'll just hear about a one-number standard, dBA. In Illinois, they limit it in these nine different frequency bands.
So these limits here are for noise being emitted from a Class C land, such as an agricultural property, onto Class A land, which is a residential property. Furthermore, these limits are the nighttime

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limits. There are many other limits contained in the Illinois regulation, but they are higher, for example, during the daytime. So this project is being designed to meet the most stringent limits 24/7.
If you go to the next slide, I've added a piano keyboard here because I think everybody kind of understands a piano keyboard and what it sounds like. We need to understand a little bit the concept of frequency.
The lower band, labeled 31.5 hertz, that's the lower end of the piano. So if somebody was to play the Jaws theme, that's what you'd hear. If I was to lay on the bottom ten keys or so of the keyboard, that first red bar would go up. So Illinois has a limit for that band of frequencies and all of the other eight bands up the scale.
One thing that will become evident in my presentation later is that it's that 500 hertz band, the one roughly in the middle, with the limit of 47 -- that's what it's all going to come down to. So while we may have all of these numbers here, at the end of the night, for various reasons that I will explain in a minute, it's that 500 hertz band that really matters.

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One other note about this -- oh, there we go.
(PowerPoint up now.)
I'll back up one moment for the benefit of the audience. Illinois has these nine different limits, and they all pertain to a certain band of frequencies. It's that one kind of in the middle of the keyboard, the 47 dB limit at 47 hertz, that's going to be controlling.
The other thing, you know, if you got a bunch of people together and we pressed all the keys on this keyboard together, that total sound, that's the total sound. So when you hear of a one-number limit, that's what they're talking about. Again, in Illinois, it limits each of these little bands.
Next slide, please.
So a little bit about my qualifications. Why am I qualified to be sitting here in front of you? I've been doing this for about 27 years as my sole and dedicated career to acoustics. I've been involved in about 500 or so projects located across the United States. I've even had the fortune to do some international work.
I've worked in multiple industries: power,

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highway, mining, all kinds of different things. I think it's a benefit. It gives me some good perspective on these projects.

I also conduct research. I keep active in my professional society. And I provide expert testimony to boards such as this.

Next slide, please.

All right. So one more crazy frequency graph. Just to give everyone an idea of this, you may have heard that humans can hear from 20 hertz to 20,000, or maybe you haven't. That's the audible frequency range.

The stuff way up high, wind turbines do not produce much above 10,000. What does gets absorbed into the atmosphere before it ever gets to a residence; so that's not of our concern. Our concern lies somewhere in the 20 to 10,000 hertz range.

You will hear sometimes with regard to wind turbine noise about low frequency noise. That's why I've highlighted that here. That's that lower third of the keyboard, those low notes. And I'll come back to low frequency noise in a minute.

Next slide, please.

I went over this presentation this morning,

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and I just kind of reorganized a couple of things in my mind to make it flow better; so I'm going to skip over this and then come back to my measurement experience and why that's important later.

All right. So back to the main event, these regulations. Next slide, please.

We need to demonstrate compliance with this, but there's no project constructed right now; so we can't go out and measure anything. We have to predict it or use a model.

Next slide, please.

The model we use is essentially a mathematical model. It's produced by the International Standards Organization, Method Number 9613. It's used by virtually every acoustical consultant in the country. It's used for wind turbines. It's used for other power plants and, again, gravel pits, what have you.

The way the model or the method works is you get a emission factor. Emission factor is how much sound, in this case, does a wind turbine produce. Wind turbine manufactures, General Electric, Vestas who have you, they measure -- in a test environment, they measure the noise from their turbines and hand

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that data over to someone like myself.

Then we use this -- so we plug that into our model. We also want to know: Is the sound directed? Does it produce its noise only in one direction?

The model also covers divergence. When sound comes off of a wind turbine, it spreads out in all directions, and it loses energy as it spreads; so we model that.

Atmospheric absorption. When sound waves travel through the air, they actually get converted into minute amounts of heat, believe it or not. So some energy is lost due to atmospheric absorption.

There's also the ground. Sound travels along the ground. Some of it is absorbed, and some is reflected. So the type of ground impacts how loud wind turbine noise is going to be at a residence.

There are also barriers, which, in the case of wind turbines, are not applicable due to their height.

Vegetation can absorb noise, but we largely ignore that.

And then meteorology or the weather or the atmosphere is very important on this subject. I'll get back to that in a minute.

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Next slide.

This is a graphical picture of our model. We actually physically model these facilities. Invenergy will tell us exactly where they intend to place the turbines. We know exactly where the residences are located via maps. We plug all of this information into our model, and this is just a graphical representation of it.

Every single turbine is represented as an emitter of noise. Every residence is represented as a receiver of noise. And, again, it's all to scale, including the height. The model knows where the ground is, all of that.

Next slide, please.

All right. So this is, to me, a very important concept in wind turbine noise prediction and predicting compliance with the Illinois Pollution Control Board regulations.

The atmosphere is critically important. During the daytime, the sun is heating up the air, and it's kind of roiling all around. Sound waves don't propagate through that very well. So a lot of times during the day, you won't even hear that distant highway or that distant grain drier or the distant

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turbine in this case.
But a lot of times, at night, the atmosphere calms down once the sun goes down, and you can get what is called a "temperature inversion." You can get certain wind conditions.
It's these nights that are kind of calm that sound propagates the best. Those are the nights when the turbine noise would be louder than during the daytime or during a stormy night. So it's really these times that I key in on as a professional because I want to make sure that I'm telling you it's the loudest. I want to report the loudest. I don't want to report the average. You know what I mean? We have to make sure that, under any conditions, these turbines will not exceed the Illinois Pollution Control Board limits. That's what I shoot for, if you will.
In order to achieve that, we assume that, first of all, of the turbines are operating at full capacity. At times they can, not always, but that can occur; so we model that.
And we assume, like I said, that the atmosphere is calm. We assume that there is either a temperature inversion or that a receiver is down wind.

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Again, maybe you can relate to this if you live near these highways that are in your county. Some nights you hear them. That's typically when the wind is blowing from the highway toward your house. Sometimes you don't. Same highway, same traffic, same distance, different atmosphere. It can make a lot of difference. We assume it's one of those nights where you can really hear it.
So now, if I can go back up to a couple of slides up -- I guess I have control here -- to this. I want to talk for just a minute about my measurement experience because I think this is very important. Not to be disparaging, but I think some acoustical consultants are desk jockeys. I'm a desk jockey sometimes. But then, for a good number of projects, I have been out in the field measuring for days, weeks, months; and even on one project, it went on for years. A lot of times I'm out there in the field all night long listening, measuring. So I have a really good firsthand understanding of what these things sound like.
Better yet, I take my model -- so when I do a measurement project, at the end of that project, I say: What's the loudest I ever measured of these

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turbines? And then I build a model of that, and I compare the two.
I have found that how I have my model set up, I know that it replicates the very loudest that we're ever going to experience. I'm obviously belaboring this point, but I think it's very important.
So finally I get to the point. This graph shows -- I've now plotted on top of the Illinois Pollution Control Board regulations the noise level predicted at the one residence where we expect it to be the loudest. Everything else is less. So this is the worst-case level.
As you can see, due to the shape of the limits versus the shape of the predictions, the 500 hertz limit becomes the pinch point, if you will. If you meet the limit in that band, everything else will be compliant. So you'll notice that we are predicting at this closest receptor to be at the limit, just below, but at the limit.
If you remember all that I just talked to you about, the conservative nature of our predictions, this is the worst case. Everything else is going to be less. So on nights when the atmosphere is not as

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conducive to sound propagation, the levels will be lower. For the houses that are located further from turbines, the levels will be lower.
Also keep in mind that the daytime limits are about 5 dB higher, but we are designing to meet the nighttime at all times.
Just real quick back to this graph, I want to talk again about low frequency noise briefly because you will hear about that with regards to turbines.
So here I've just highlighted -- it's the same chart, the same information. I've just highlighted the low frequency portion of the Illinois limits. As you can see, we are a couple, 2, 3 decibels below those limits in the low frequency bands.
So if I could just summarize, the analysis that I conducted shows, demonstrates -- and you have our report as part of the permit submittal -- that wind turbine noise levels at all nonparticipating residences will be below the Illinois limits. Some of the limits are close to the limit, but that is for the worst case. And at a majority of the residences, the levels will be far below the limits.

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We've validated our model. So we're not just using some mathematical model that we're not comfortable with. This is a model that I've used on dozens of projects and that I've compared against some of the most robust measurements that exist on this subject.

Noise levels a majority of the time will be lower due again to the atmosphere. I had a project recently where we were trying to find those nights when it was -- when the noise would really propagate well. And over the course of a couple of -- I think a combined six weeks in the field, we might have had one or two of those nights. I'm not saying that that's going to be the rate here in McLean County, but this does not happen every night. So a majority of the nights, the levels will be much less than what I've predicted.

And finally, as I've just mentioned, in terms of low frequency noise, the predicted levels are below the Illinois limits.

That is all I have for a presentation, and I'm happy to answer any questions from you or the public.

CHAIRMAN FINNIGAN: I think we're ready for

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questions from the Board.

MR. GRIFFIN: Mr. Chairman, I'd ask that Mr. Hankard's PowerPoint be entered into the record as Applicant's Exhibit Number 10.

CHAIRMAN FINNIGAN: That will be done.

MR. BANGERT: For Illinois winds, the predominant direction of the wind during the summer for your studies, what was the finding there, or does that enter into your studies?

MR. HANKARD: It does not because we assumed that every residence was down wind of every turbine at all times. Obviously that can't exist, but it's the worse case. Again, just really trying to make sure that we have modeled the worst case.

So we don't have to worry about wind direction because we're not taking a correction for it, if you will. We're assuming down wind all the time.

MR. BANGERT: Okay. If a person was to consider the predominant winds, because people are going to be outside their residence -- I'm going off of recollection, but most of our summer winds would be out of the northwest. If we were to choose the location for -- and I'm not saying myself, but if a

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location for a wind turbine was to be situated on the down-wind side of a residence, that would be obviously even better yet; is that correct?

MR. HANKARD: Yeah. If it was a single turbine controlling the noise level. If you have turbines in different directions, then you can't really avoid any one direction. But if you have a residence where there's one turbine that's the controlling factor, then having it down wind of the house would result in a lower noise level, yes.

MR. BANGERT: Thank you.

MR. DEAN: So for your study, you differentiated between participating and nonparticipating residences?

MR. HANKARD: That's correct.

MR. DEAN: Thank you.

MS. TURNER: Can you give me an example of what types of nights generally the sound travels more? I know these cold, frigid nights where we have our windows closed, it seems to travel more. But what type of nights when it's nice out, when people would have their windows open or be outside, would the noise travel? Can you describe that type of night?

MR. HANKARD: Sure. I guess I would say,

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overall, it tends to occur in the -- it can occur at any time, but in the spring and in the fall. Because in the summer, you have just a long day of heating. And, again, the atmosphere is very turbulent, and it takes a bit of time after sunset.

So in the spring and the fall, you can get these evenings where -- it would not be a windy night. It would be relatively calm. And, you know, a temperature inversion will set up -- which is where -- usually it gets colder as you go aloft, but there's certain conditions that can occur where it gets a little warmer aloft. That causes sound waves to bend back down towards the earth. So sound energy that ordinarily would have gone up, up, and away kind of stays down; and therefore, it's a little louder at the residences.

That's not something that you really even hear on the 6:00 news. They never really talk about temperature inversion; so that's not something you're going to know exists. But, again, it's just those nights where -- I don't know -- you walk outside, and it's kind of nice because it's not blustery.

MS. TURNER: So more frequent in the spring and fall?

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MR. HANKARD: That's correct.
MS. TURNER: You said you've done a lot of field measurements, and you're using this based on modeling that you've done.
Have you taken models of these types of turbines that they are using? Have you done field work on these type of models to prove in the field that these models are good, you yourself?
MR. HANKARD: Yes, I have. I've been involved with six or eight of some of the longer -- with wind turbines, you can't just go out for a night and stick your sound level meter in the air and measure. Well, you can. But you have some data that's of dubious quality.
What you really need to do is either spend night after night in the field yourself, or you leave the equipment there. It runs all night for weeks and weeks, and then you analyze the data. Again, these nights where you're asking me how often do they occur, we want to get data on those nights. We tend to leave our equipment out for weeks to months, and then we'll be able to review and see, aha, it was that night.
To your question about these types of turbines, yes, the GE turbine is one that Invenergy

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has utilized on many of its previous projects; so I do have a lot of direct experience with these similar turbines.
MS. TURNER: And you obviously find your models to represent them well, then?
MR. HANKARD: They do indeed. And I'll mention one project we did in Illinois a number of years ago. We found that the model was actually underpredicting a little at 500 hertz; so we actually -- once the model gives us our numbers, we add one to the 500 hertz. It's just another way we're trying to be as conservative as we can.
MS. TURNER: Thank you.
MR. ZIMMERMAN: On the turbines that you monitored, what size were they?
MR. HANKARD: I've monitored a number of different-sized turbines, everything from 1.5 megawatts up to 2.5 megawatts.
MR. ZIMMERMAN: What is the difference in terms of the decibels coming out of the higher ones, which is what we're considering here?
MR. HANKARD: With wind turbine noise, it's like real estate; it's location, location, location. And we don't often measure from one turbine. So to

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say that I got louder levels on one project versus another, it may not have been because the turbine itself was louder but because there were more of them. So it's always a balance between those two things.
Again, the louder levels may or may not have been related to any given turbine.
MR. ZIMMERMAN: Were the larger turbines noisier?
MR. HANKARD: You know, it's not a question of a larger turbine. Really it comes down to tip speed. This is getting to the physics of a wind turbine. It produces noise primarily as the blades cut through the air. Yeah, there's a gear box, and there's that inside the nacelle, the hub; but that's not what is reaching the residence. It's the blades cutting through the air.
The tip speed is a function of the how wide the rotor is times, with a few factors involved, the rotational speed. So you can have a larger turbine; but if it's turning slower, it won't be as loud.
It's not just a direct relationship between size. It's actually primarily tied to tip speed.
MR. ZIMMERMAN: Aren't the larger turbines -- don't they have larger diameters and larger radii?

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MR. HANKARD: They do have larger --
MR. ZIMMERMAN: So they would therefore be going faster.
MR. HANKARD: If they rotate at the same speed. So you can have a turbine with a larger rotor diameter, but it doesn't turn as fast.
MR. ZIMMERMAN: What I'm trying to get to is, on these turbines which go a little faster, how do the models -- how does your model line up with what we're going to be seeing if these were approved?
MR. HANKARD: Well, all of the data that was provided to us from the manufacturer is either directly measured by them or based on their experience of measuring their own turbines for years.
So these larger turbines that are being employed today in the industry are really just a slightly larger -- the noise levels do go up as the tip speeds go up, but it's a fairly well-understood phenomenon.
MR. KURITZ: You mentioned that they're using, on some of the rotors, these new noise-dampening blade tips. What kind of difference in sound will they produce, and how do they do that?
MR. HANKARD: Right. With GE, it's called

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low-noise trailing edge blades, LNTE. So what people like myself have found through detailed measurements is that a lot of the noise comes off the back end of the blade.

So as the blade, on the downstroke in particular, is sweeping through the air, it's causing turbulence. And they studied, honestly, owls' wings, and perhaps there were some other studies involved. They found that the owl wings have serrations, that the feathers have a lot of little edges to them. That decreases the amount of turbulence on the back of an owl's wing, which is why they're quiet.

So they mimicked that with wind turbines. So the back edge of the blade is serrated. That decreases the amount of turbulence coming off the back of the blade, decreases the noise, by about 3 decibels for any given turbine.

CHAIRMAN FINNIGAN: Do you come back after the project is done and verify your noise level?

MR. HANKARD: Different projects are different. If it's a requirement of the project, then yes. If it's not a requirement of the project, then not necessarily.

CHAIRMAN FINNIGAN: A follow-up question

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would be: If you came back and found that the noise was above your levels that you were projecting, what would you do to correct it?

MR. HANKARD: The options at that point are -- you can slow the turbines down artificially. Turbines always seek the wind. They seek to extract as much energy out of the wind as they can. That's how they're programmed.

You can change that programming. You can say: Hey, I know you want to spin really fast right now; but because of the noise requirements, you can't. And you essentially slow the turbine down via programming. It's called "noise-reduced operation."

CHAIRMAN FINNIGAN: You might not be able to answer the question, but I just wonder why you don't use the lower-noise blades -- you know, why are you not going to that technology? Is that something that costs more or is not as efficient?

MR. HANKARD: You are very astute. You hit them both. They do cost more. There is a cost element. I don't think it's huge in the grand scheme of things. And there is, I believe, a small efficiency loss.

But I will say the industry has embraced --

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I think it was a less-understood thing at first, but I see these being used fairly routinely now on projects.

CHAIRMAN FINNIGAN: Any other questions from the Board?

(No response.)

CHAIRMAN FINNIGAN: I think staff has a couple of questions.

MR. DICK: These turbines are up to 500 feet versus 450. Given the type of noise that they project, how much further would the setback need to be to have the same amount of noise?

MR. HANKARD: Height doesn't really enter into the equation that much, to be honest with you. So the difference in noise between a turbine at 400 feet and one at 500 foot height is not going to change the results on the ground very much at all.

We assume, in our model, that the ground is completely reflective. We're really taking the ground out of the equation; so it's really just a matter of distance. Height is not a significant component.

MR. DICK: Would you compare the distance from the turbine to give the same amount of noise for a low-noise trailing edge blade versus a regular blade?

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MR. HANKARD: In my report, there's a table in there that shows the noise level of the regular -- the turbine with the regular blades and that same turbine with the LNTE blades. I can go over that with you, but that information is in the report. And again, it's about a 3-decibel reduction.

MR. DICK: But to get the same amount of sound, is it 100 feet or 200 feet?

MR. HANKARD: Oh, in terms of distance? Well, the general rule of thumb with distance -- it's a little complicated because it's a logarithmic relationship.

Let's say you're standing 1,000 feet from a turbine, and you measure 50 decibels. You have to go out to 2,000 feet before it will drop by 6. That's just the relationship. I don't know if that helps answer your question.

MR. DICK: I would like you to give me an estimate of how much further back you need to be to have the same amount of sound from a low-noise blade versus a regular blade, just to get an idea.

In your analysis, you showed the different types of blades required at different locations. I want to understand how you pick those locations.

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MR. HANKARD: All right. Let me answer your first question first, the estimate on the distance. I guess if it's a 3 decibel drop, you would have to go from -- let's say you started at 1,000 feet. It would have to probably go out another 500 feet.

So if I'm standing 1,000 feet from the low-noise blade, that would be about the same as standing 1,500 feet from a regular blade. It's pretty rough. Don't hold me to those numbers. But that's the general order of magnitude.

MR. DICK: That's what I'm looking for.

MR. ZIMMERMAN: I think you might clarify that if you go to the next three-decibel drop. How many more feet do you have to go out?

MR. HANKARD: So it would be -- again, a doubling of distance gets you 6 decibels. So if I'm at 1,000 feet, I got to walk another thousand before I drop by 6.

MR. ZIMMERMAN: Then do you double that again? It's 4,000 feet before you get another 6?

MR. HANKARD: That's the logarithmic nature of the beast.

MR. ZIMMERMAN: So it's a stretching-out logarithmic scale. It doesn't fall off.

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MR. HANKARD: That's right. That's the law of diminishing returns, I guess you could say.

MR. ZIMMERMAN: Okay.

CHAIRMAN FINNIGAN: At this time, we're going to open it up for questions from the audience. You want to come forward and state your name and address. And speak into the mike. This is only for questions.

MR. PITZER: My name is Jim Pitzer. I live at 29485 East 2100 North Road, Colfax. I'm about to show my ignorance here.

These measurements you do on decibel levels and impact on noise and everything, I'm assuming you're basing this -- and maybe I'm crazy here -- but you're basing this on human hearing; is that correct?

MR. HANKARD: That's correct.

MR. PITZER: Has anybody ever done any studies or wondered how this affects wildlife, which generally has a more acute sense of hearing than human beings, and what effect it might have if these are placed in the proximity of, say, a wildlife preserve or something like that?

MR. HANKARD: Yes. This question comes up a lot.

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MR. PITZER: Well, I'm not that stupid then, I guess.

MR. HANKARD: No, you're not. There are dozens if not hundreds of studies. I have dug into them many times.

What you find is most of them are associated with very loud noises such as explosions or military jet overflights, things of that nature. So it gets a little more difficult to -- when you get down to deer or just your more common wildlife, the data and the studies become a little less conclusive. You obviously can't ask the deer what they feel about it. You have to watch for changes in their behavior.

So again, a lot of the studies have focused on, let's say, critical nesting areas, something of some high value. And I've never seen anything directly related to wind turbines in terms of their impact on wildlife.

MR. PITZER: So your answer is you don't know what the effect is, necessarily?

MR. HANKARD: Not directly, no.

MR. PITZER: Thank you.

MS. WINTERLAND: Amy Winterland, 22825 North 3075 East Road, Colfax.

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So I read your noise study. First, I want to say I appreciate the conservative nature of your modeling and all of the assumptions that you included that were very conservative. I really do.

So a couple of questions that I have. I'm just going to kind of -- the way I read your report, there's going to be 79 of the 500-foot low-noise trailing edge blades, 9 of the 452 foot low-noise trailing edges, and 29 of the 500-foot standard blades.

Now, my question is: The worst case scenario that you showed us up on the screen, was that a 500-foot standard blade?

MR. HANKARD: That worst case was for a single residence, and most of the residences have more than one turbine that influence their noise level. So it wasn't necessarily one specific turbine. That residence may have had different types of turbines around them.

MS. WINTERLAND: So in that particular example, did that one residence have standard turbines around it?

MR. HANKARD: I would have to look, which I can do if you'd like.

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MS. WINTERLAND: Well, you could. That would be fine.

So my point is: I looked at my particular residence. It does have standard blades around it, and it is on your list of highest predicted noise levels at nonparticipating residences.

So you just have to tell me if I'm right or wrong that your worst case scenario had standard blades around it and didn't have low-noise trailing edge blades?

MR. HANKARD: It most likely had low-noise trailing edge blades because the way we do our studies is we start with all standard blades. We find that there are some residences that have levels over the limit; so we have to do something about that. So then we start adding in the quieter turbines in order to bring everything down below the limit.

MS. WINTERLAND: So then maybe if you could, in fact, look at your one example that was your worst case scenario, I guess maybe we need to make sure that's the case.

The assumption that I was leaping to, which perhaps is incorrect, is that, if you put the low-noise blades on, you could reduce that maximum

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down 3 decimal points.

What you're saying is, if they already had low-noise on there, that's the best you can do.

MR. HANKARD: Right. I'll continue to look it up as we go along here, but it is almost assuredly that that receptor has the low-noise trailing edge blade turbines all around it.

Because what happens if we model and a residence already has all the low-noise blades around and it's still over the limit, then we have to start eliminating turbines. So that's what we do during the design process to come up with the final layout.

MS. WINTERLAND: Okay. All right. Thanks for that clarification.

Second question: As I was reading through your report, it says, "The project-specific noise emission specifications for the GE 2.5-127 low-noise trailing edge turbine were not available from GE at the time of the analysis. So we were estimating by applying the low-noise trailing edge reduction achieved for the GE 2.3-116 to the levels of the standard GE 2.5-127."

So I guess the point I'm trying to make is: The model that you have is still based on an estimate

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of the 452-foot turbine, not the 500-foot turbine?

MR. HANKARD: That's correct, yes. You are -- you clearly read my report, and thank you for that.

Would you like me to paraphrase what she just said? You got it? Okay. So you are correct.

MS. WINTERLAND: All right. I guess that was the two questions I had.

MR. ZIMMERMAN: Ms. Winterland, what is your address again, please?

MS. WINTERLAND: 22825 North 3075 East Road, Colfax.

MR. ZIMMERMAN: Thank you very much.

MS. COTTER: My name is Julie Cotter, C-o-t-t-e-r. The address is 23571 North 2900 East Road, Lexington.

First of all, I just want to clarify. Did you say that you had a designation between participating and nonparticipating residents?

MR. HANKARD: Yes.

MS. COTTER: Why is that?

MR. GRIFFIN: If I can answer a portion of that, that has to do with the Illinois Pollution Control Board regulations and how those are regulated.

For one, the -- for many of the

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participating property owners, they live on the same parcel that has a turbine that may be producing the noise.

The Pollution Control Board regulations deal with the amount of noise that's being produced across a property line, not on the same property. So that's the point of measurement across a property line; and/or, at a use classification, it's a little more complicated than that. If you had a large parcel that was farmed and then a residence, there's two different classifications.

But it has to do with noise crossing property lines. For many of the participating property owners, the noise from the turbine that would be causing most of the sound is not crossing a property line. So that's one reason.

The second reason is, pursuant to the general terms of the lease agreement that the Applicant has with their residents, they have agreed, to the extent there is a violation -- which we don't believe there would be -- they have agreed to waive any claims as to noise or other impacts caused by the turbine. That's part of the bargain that they enter into when they have the lease agreement.

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So those are two reasons why the applicant asked Mr. Hankard to limit his review to nonparticipating residences.

MS. COTTER: What about those of us who own 6 acres and are surrounded by about 12 of these and are nonparticipating residents?

MR. HANKARD: Yeah, you should be in the study if you are a nonparticipant resident.

MS. COTTER: But you just said you're taking more care of the participating residents that live on their property. Am I misunderstanding?

MR. HANKARD: I think so, yeah. We did not address noise at the participants. They are participating. We address noise only at nonparticipants.

MS. COTTER: Okay. Thank you for clarifying that.

Is there any way that you could bring a recording or something of that noise level that is acceptable that we could all hear it? I mean, most of us -- I know that noise levels of some industrial areas are probably acceptable in Illinois, but that doesn't mean that those of us that live in the country even know what that is or that that's acceptable.

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Could you provide -- I mean, could you go out some night and record that?

MR. HANKARD: Yes. This comes up a fair amount. You're in good company with this question. And, yes, an audio demonstration could be given. In fact, in a room like this, it stands half a chance of being realistic because it's a beautifully acoustic room.

So I do have recordings of wind turbines, lots of them, and we can play them here. We could set up a sound meter and adjust it so that we get the level that we're predicting. That can all be done. But it is a little different being in this auditorium versus being outside. So you just would have to understand it's not a perfect demonstration. But it can be done.

MS. COTTER: It would be a general idea. I think most of us here have no clue. I would appreciate that, and I know several of my neighbors would appreciate that, if you wouldn't mind doing that.

MR. HANKARD: If that's what the procedure dictates to me, I would be happy to.

MS. COTTER: It is also my understanding --

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MR. GRIFFIN: Ma'am, I'm sorry to interrupt. I want to add something again on the regulations. The particular regulations that this project was measured against were those that are set forth by the Illinois Pollution Control Board for residential uses. There's a use classification.

You had mentioned what might be acceptable for industrial wouldn't be acceptable for residential. You are exactly right. There's different standards depending on the receiving land. You have residential land; so that would be subject to the most stringent standard, and that's the standard Mr. Hankard measured against, the most stringent standard.

There's other standards for, say, commercial. We didn't even bother to get into those because you can be noisier in commercial. We're only concerned with meeting the most stringent requirements.

MS. COTTER: Okay. Thank you.

It's also been brought to my attention that, last year in Livingston County, Dr. Schomer, who was an Invenergy employee, his recommendation said that homes are not protected within 3,200 to 3,400 feet. And you're wanting to put these at 1,500 feet from our

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residences?

MR. HANKARD: Yes. I'm very familiar with Dr. Schomer. He's not an employee of Invenergy. He has consulted with Invenergy on a couple of projects that I'm aware of. He's an independent consultant like myself, and he has made claims.

I've never heard him say a number as low as 32. I'm not trying to challenge you or anything, but I know he has espoused lower limits as have many -- different consultants have different recommendations.

MS. COTTER: These are higher limits.

MR. HANKARD: 32?

MS. COTTER: 3,200 feet from a turbine --

MR. HANKARD: Right.

MS. COTTER: -- to a residence.

MR. HANKARD: He's espousing a greater setback to achieve a lower noise level essentially.

MS. COTTER: And that was his recommendation to be acceptable.

MR. HANKARD: That is Paul's opinion, yes.

MS. COTTER: As opposed to your opinion.

MR. HANKARD: Well, it's not my opinion. I'm bound by the regulations. We're trying to achieve those.

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MS. COTTER: Okay. Will people actually be able to sleep with their windows open 1,500 feet from these turbines and not hear this noise or be affected by this noise?

MR. HANKARD: I guess let's take it one at a time. Will they hear it? Yes, they could hear it. On those nights I mentioned, these levels of noise will be audible.

Inside homes, in my experience and on many other measurement surveys, the noise from the turbines is -- you have to strain to pick it out. The windows open is a good observation because that does make a significant difference.

MS. COTTER: We don't run our air conditioning.

MR. HANKARD: Fair enough. And you shouldn't have to.

MS. COTTER: That's right.

MR. HANKARD: So if you have predicted levels in the 40s and you have your windows open, you might be able to hear the turbines on certain nights.

MS. COTTER: Would we have to call then and get them turned off, as people have done in the past?

MR. HANKARD: I believe the Pollution

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Control Board regulations -- you know, it would be a complaint, and then there would be measurements to determine if it was in compliance.

MS. COTTER: Do you have any idea how many times the turbines had to be turned off at Ted Hartke's house?

MR. HANKARD: I am familiar with the Hartke situation, and I know they tried turning off and on turbines for Mr. Hartke.

MS. COTTER: 51 times. And his turbines have setbacks of 1,665 feet, 2,025 feet, 3,000 feet, and 3,400 feet. All four turbines had to be turned off.

CHAIRMAN FINNIGAN: We're going to have to stick to questions. That's testimony. You can come back later if you want to say that.

MS. COTTER: Okay. Thank you.

MR. SCHWASS: Glen Schwass, 27709 North 2550 East Road, Lexington.

MR. DICK: Could you repeat that, please?

MR. SCHWASS: 27709 North 2550 East Road, Lexington.

I have several questions, but I think a lot of them have already been addressed. I'd like to

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recap a little bit on them if I could.

There was a question about the livestock and animal studies and such. I'm understanding that there is no clarification of the effects that it has on livestock or family pets.

MR. HANKARD: I've never seen a study that dealt with wind turbine noise and livestock. So my understanding -- that's all I have to say, I guess. I'm sorry.

MR. SCHWASS: I'll follow up with another question. So everything you have is based on models. When this -- if this project goes through, you're saying there are no procedures or any type of work orders or requirements for you to come back and do a study. Did I hear that correctly -- in this project?

MR. HANKARD: Right. There aren't any requirements that I'm aware of. The Illinois Pollution Control Board has a dispute resolution process. So you would issue a complaint, and that would get filtered to Invenergy. They would be required to demonstrate compliance vis-a-vis measurements.

MR. SCHWASS: What is the time frame from the time that complaint is made to when a resolution

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is resolved?

MR. HANKARD: The process can begin very quickly. So if a complaint was issued, they call a person like me and say: "Mike, we have this situation in Illinois. Can you get down there?"

I can be on the scene within days to a week. There is some equipment involved that we have to get ready. And then it's a question of Mother Nature. Does she contribute to give us some nights with some wind that we can actually measure. You can get on the ground, and it can be calm for days; so we can't control that.

But we can get on the scene very quickly and get to measuring. Then as soon as there's enough data that's been produced, we can make a determination.

MR. SCHWASS: Again, my question is: How much time? I understand there's some factors in there, but somebody has to have some kind of an expectation of how many nights they're not going to be sleeping because of all this noise.

MR. HANKARD: It's certainly going to be weeks. It's not going to be hours or days. It's going to be weeks.

MR. SCHWASS: So within 30 days, there

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should be some type of a resolution?
MR. HANKARD: That's a reasonable number, yes.
MR. SCHWASS: Is that something that should be put in the requirements then? You're presenting all the positives of which you have. That's not a positive. So why wouldn't that be something that you would put in the requirements as to time frame to get done?
MR. HANKARD: I don't think that's a question for me. Jim perhaps?
MR. GRIFFIN: That's a state agency process from the Illinois Pollution Control Board. So how fast that moves would not be exclusively within the control of either the Applicant or the County or the complaining party. It's a procedure that they have put in place; so you have to follow that procedure. The time it would take would be whatever time it takes under that procedure.
Obviously, the goal is to resolve these issues quickly, but there is a procedure involved. It's a process.
MR. SCHWASS: And I appreciate that, but I think people that are having problems would like to

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have resolutions quicker than just a formality through a big organization. I think an expected time frame should be something that should be noted.
MR. GRIFFIN: There is also -- I mean, there's complaint resolution. I know that the Applicant will have an office that can field complaints. You wouldn't necessarily have to file something with the Illinois Pollution Control Board as step one.
Certainly the Applicant is going to be responsive to issues raised in the community if there are problems, and that is part of the commitment in the application to do that and to be responsive quickly to complaints by residents in the area.
MR. SCHWASS: I'm going to read a statement followed by a question because I think that clarifies the question.
It says, "Besides the noise and the vibrations such huge-moving machinery unavoidably generates, it must be topped with flashing lights day and night to increase their visibility. The moving blades attract attention, and they must be erected where there are no other tall structures to obstruct the wind."

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So my question is this: Are wind turbines more or less intrusive than other structures of similar size?
MR. HANKARD: In terms of noise?
MR. SCHWASS: Are they more intrusive than other structures of similar size?
CHAIRMAN FINNIGAN: This is just about noise. You may have to bring that question back to another person.
MR. SCHWASS: That would be fine. I'll follow that with one more question.
You talked about the noise levels. And I believe you stated you're from the state of Wisconsin.
My question on this is: Are you aware that within the state of Wisconsin they have started to realize that turbines have been labeled as health hazards and, in fact, are being studied by the state because of those issues?
MR. HANKARD: I am familiar with the issues in Wisconsin, yes.
MR. SCHWASS: Can you elaborate on those?
MR. HANKARD: The problem I face here is I'm not a medical expert. I can talk to you about noise levels, but I'm not qualified to discuss health

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issues.
MR. SCHWASS: But the health issues are related to some noise issues.
MR. HANKARD: They are related. And when I testify, I bring the noise level aspect of it. Other people will have to testify as to the medical and health ramifications.
MR. SCHWASS: We'll have the opportunity to come back for a conclusion, correct?
CHAIRMAN FINNIGAN: Yes.
MR. SCHWASS: So I'll save that for when I come back.
My last question to you is this: All the noise levels are based on decibels and hertz. How does that affect cable, satellite, cell phones, other wireless devices that farmers and/or rural people might have?
MR. HANKARD: Again, with the acoustics, it would have no effect on that.
MR. SCHWASS: The acoustics would not, but what about the hertz. What about the hertz levels? You said you had 500 hertz, I believe?
MR. HANKARD: Yes.
MR. SCHWASS: And frequencies are all

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megahertz. So what is the impact on the hertz with the effects of the towers?

MR. HANKARD: Of course radio communication, cell phone communication, that's all electromagnetic energy; and we're talking about acoustic energy. The two do not affect one another. So sound waves will have no impact on any radio communications whatsoever.

MR. SCHWASS: But didn't you say something about the sound waves getting converted to heat, which is an energy?

MR. HANKARD: Yes, that's true. When sound propagates through the atmosphere, it vibrates molecules and gets converted into heat; but it has no effect on electromagnetic wave propagation.

MR. SCHWASS: But it disrupts the hertz.

MR. HANKARD: But you can express anything in hertz. You can have an electrical signal in hertz. You can have an acoustic signal in hertz. Just because they are expressed in those units doesn't mean they affect one another.

MR. SCHWASS: I'll follow with one last question. With the advent of cell phones now -- everybody has them -- you're telling me that the frequency and the hertz can't be affected if I need to

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use my cell phone in case of 911 for an ambulance or a fire department, things like that? I'm going to have no disruption in making that call at any given time?

MR. HANKARD: Well, again, in terms of acoustics, no. And I can just -- my own personal -- I mean, I'm in these fields, wind turbines fields, all the time, and we use our phones on a regular basis. I've never personally had any disruption whatsoever.

MR. SCHWASS: But it's possible?

MR. HANKARD: I'm not an expert in that field.

MR. SCHWASS: That's all the questions I have. Thank you.

MR. ZIMMERMAN: I have a quick review for Mr. Hankard.

How far away from the turbines were you measuring the sound, and are your projections -- this may be a second question -- and are your models based on that?

MR. HANKARD: We have measured at various distances. I always focus on, you know, the 1,500, 2,000 feet, 2,500 feet because that's where the closest residents tend to be and that's where I want to make sure that I'm accurate.

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MR. ZIMMERMAN: Thank you.

CHAIRMAN FINNIGAN: I've got one follow-up question, I guess. You were asked about coming back and checking. That's really not your job, is what you're saying, at that point? It's somebody else's hurdle to make that happen?

MR. HANKARD: No. I might be the guy that gets the call. It's well within my technical wheelhouse.

But the question, I believe, was: Is it required or not. That was the point I was making. It's not required, but it would only be done as part of a complaint resolution process.

CHAIRMAN FINNIGAN: Have you ever gone back and checked one of your projects on what you've done compared to what your estimates are?

MR. HANKARD: Yeah, every single measurement project we undertake, we end up creating a model of that project to do that very thing, to compare. How is our model working? We always want to continue to refine that and understand that.

CHAIRMAN FINNIGAN: How do they come out?

MR. HANKARD: We've got it dialed right in. That's why I'm so confident in my work, is because of

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the measurements and the way I've kind of tied these two together. We find our models to be very accurate.

CHAIRMAN FINNIGAN: What you're trying to say is, the more you do, the more you dial this in to make it better for the next time you do one?

MR. HANKARD: That's correct.

CHAIRMAN FINNIGAN: Thank you.

MS. SLEETER: My name is Laurie Sleeter. I live at 23903 North 2900 East Road in Lexington.

MR. DICK: Could you spell your name, please?

MS. SLEETER: L-a-u-r-i-e S-l-e-e-t-e-r.

I was here on Tuesday night. It sounds like a great project, but we don't have any examples. When Julie mentioned the fact that it would be nice to hear what we will be hearing out in the country, I thought that was pretty interesting.

I'm wondering if we could -- and how is it going to happen -- if we could see the noise that you have recorded and also, you know, be able to turn it up. Like this would be a normal noise for the daytime if you live where we live, and this will maybe be the normal noise at night.

Just curious if we could have that example

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played here in this auditorium during this procedure.
MR. HANKARD: The answer to your question is, yes, a demonstration can be done. We could pick certain noise levels to replicate. That can be done.
MS. SLEETER: Can it be done in this zoning board process?
CHAIRMAN FINNIGAN: I'm going to ask you a question.
MS. SLEETER: Sure.
CHAIRMAN FINNIGAN: Have you ever been to one of the other wind farms in McLean County?
MS. SLEETER: Honestly, yes. However, my house is 113 years old, and noise goes through my windows and walls in a different manner than when I'm standing outside hearing them.
I think: Gosh, what is that noise? Is that a plane? Is it a semi going? And I'll run outside, and it's just a regular truck.
So I'm very curious about what the sound is going to be. It's not a constant noise, of course. It's a whoosh, whoosh, whoosh. Since the turbines will be larger, I'm afraid that I can't get to the ones in the other projects in this county as close as my house is going to be.

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So I'm curious what it will sound like in my house. I'm afraid that I won't really know until the project is completely done and I'm stuck. I would love to hear it tonight or Tuesday, if we could.
MS. TURNER: You're afraid that you won't be able to get close enough? Is that what you said?
MS. SLEETER: Yeah because there are six directly west of my house.
MS. TURNER: You can get pretty -- I mean, a lot of them are very close to the road; so you can have access from --
MS. SLEETER: Right. But there's not five behind those. They're all west of me. So I don't think I can replicate what it's going to be like, and that's why I'm asking.
MR. GRIFFIN: If I can address that? As Mr. Hankard pointed out, the difficulty in trying to replicate anything is there's no normal. That's why we make the worst case scenario assumptions. The weather is different. The wind direction is different. The ground cover, whether it's frozen, whether it's in the summer, is different. So there's no normal.
The ambient noise levels, which are not

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accounted for in this study, which is basically the background noise that you would hear on an everyday basis, are different at every residence. So you may be close to a highway, or you may not be. That's going to affect what you hear or don't hear from any noise source, including the wind turbines.
So it's impossible for us to come in here and say: Here is the sound you're going to hear. It's impossible for us to be able to demonstrate that.
What we can do is the best we've done here. By utilizing the model, we can assure that the decibel levels at these various levels won't exceed the residential standards that the State has established. That's really all we can do. We can't tell you what it's going to sound like on a particular night or whether you'll even be able to hear the turbines on a particular night.
MS. SLEETER: So your answer is no?
MR. GRIFFIN: My answer, it is no because, to come in here and to play something would not be -- we wouldn't be able to assure you that that's actually what you will or won't hear. That's the problem. We cannot -- you know, we can't replicate the conditions at your home and in the vicinity of your home to tell

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you what a sound is going to be like.
MS. SLEETER: Okay. Thank you.
MR. ZIMMERMAN: Your address, Ms. Sleeter, was?
MS. SLEETER: 23903.
MR. ZIMMERMAN: And 2900 East?
MS. SLEETER: Correct.
MR. ZIMMERMAN: In the public record are these maps that show where your house is and how far away the turbines are. So you could measure them.
The nearest one is a little over a mile. That would be number 103. So if you can look at these documents, they are available online, or we might be able to make a copy available.
You can measure that. So this is a mile. This is a mile and a quarter. And another one is -- however long. Measure that out, and then you can go out and test it for yourself. So you might be able to perceive that.
I'm not suggesting this as a remedy for this, but you're trying to answer a question for yourself.
MS. SLEETER: I do have the map that has the decibels rated for where I live. And it's 44.

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MR. ZIMMERMAN: Pardon?
MS. SLEETER: 44 decibels.
MR. ZIMMERMAN: 44 decibels, okay. So you have that measured. Okay. Thank you.
MS. PITZER: I have one question. Terry Pitzer, 29485 East 2100 North Road, Colfax.
MR. DICK: Could you spell your name, please?
MS. PITZER: T-e-r-r-y P-i-t-z-e-r.
I'm sensing that this is a very different project than the Board worked on or approved on the other side of Route 9 because it was more rural.
Can you tell me how many homes of nonparticipants are within a half mile of your projected turbines?
MR. HANKARD: That's not a number I have off the top of my head.
MS. PITZER: I think it would be an important number for the Board to know.
MR. HANKARD: Your question is how many nonparticipant residences within a half mile of any turbine?
MS. PITZER: Yeah. It's a quality of life issue for people who live in this county. And it

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appears as though there are many more residences affected by this than the more rural setting of the last wind turbine farm that was approved.
CHAIRMAN FINNIGAN: I think we're talking about noise, but maybe they could get that answer to you at a different time.
MS. PITZER: Well, there's a lot of homes that are affected by the noise. That's why I'm asking. There are a lot more residences, perhaps, according to the map, and the proximity of the clusters and the town that would be affected than the open spaces of the other one.
CHAIRMAN FINNIGAN: It may be something they have to compile and get back to us though.
MR. PARZYCK: Mr. Chairman, we can provide that number. We'll provide that at a future date.
I would say, though, that the discussion that Mr. Hankard has here has been with respect to compliance with regulations and that any of the figures shown in the documents are the maximum amounts under this very conservative analysis and that any of the existing wind farms, regardless of the size of the turbines or the setbacks, are under the same noise compliance standards that we would be meeting at these

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residences. So there wouldn't be a difference regardless of what the turbine characteristics are.
CHAIRMAN FINNIGAN: Is there anyone else in the audience that wants to ask questions at this time from this witness?
MS. EMBERTON: My name is Sara Emberton, E-m-b-e-r-t-o-n. I live at 25218 North 2175 East Road, Lexington.
MR. DICK: Could you repeat your first name, please?
MS. EMBERTON: Sara, S-a-r-a.
MR. DICK: And your address again, please?
MS. EMBERTON: Sure. 25218 North 2175 East Road, Lexington.
My question, upon some research, is just in regards to any kind of lawsuit regarding the noise levels and what the outcomes have been.
My question, I guess, is: How many have you guys been involved in as a company regarding noise, and what were the outcomes or resolutions of all of those lawsuits?
MR. GRIFFIN: Ma'am, Mr. Hankard is not an employee of the Applicant. He's a consultant that's been retained for this project. So he wouldn't have

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any knowledge.
MS. EMBERTON: He doesn't have the lawsuit knowledge as a consultant?
MR. GRIFFIN: Well, he wouldn't have the company knowledge as a consultant unless he was retained to work on the lawsuits.
MS. EMBERTON: So can we hold this question until later then with someone else who might be able to answer it better?
MR. PARZYCK: I can answer that. I don't think it's going to satisfy you. I don't have that information. Those are issues that are dealt with in our Legal Department. As you can imagine with the Legal Department, they keep that sequestered from us.
I'm not quite sure how it applies here. Lawsuits may or may not occur elsewhere in the country; but unfortunately I don't have that number, and I can't really discuss -- even if I did, I don't know the particulars of any lawsuits that might be out there.
MS. EMBERTON: So, again, will there be other people to speak to that or no?
CHAIRMAN FINNIGAN: I don't have an answer for that. Do you?

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MS. WALLEY: It will be up to the Applicant what witnesses they provide. At a later time, there may be someone who can speak to that, but there may not.

MS. EMBERTON: Okay. Thank you.

CHAIRMAN FINNIGAN: One more time, is there anyone else who wants questions at this time?

(No response.)

CHAIRMAN FINNIGAN: Seeing none, we might take a break right now in between witnesses. So we'll take a ten-minute break. That will get us back here at 7:45.

(Recess in proceedings.)

MR. DICK: If you all want to testify after the Applicant gets done with their witnesses, we may not get to it tonight; but we took your signatures on Tuesday, and we're going to take them tonight. There's an area over here where you can sign up, whether you're a supporter or an objector or if you want to be a neutral party.

In any case, if you want to speak, you can sign up over here. And if you signed up on Tuesday, we still have your name. You don't have to sign up again.

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CHAIRMAN FINNIGAN: I think we're going to move on to the next witness.

MR. GRIFFIN: Thank you, Mr. Chairman. Next witness is Andrea Giampoli. She's going to testify concerning environmental issues. She has a PowerPoint that goes along with her testimony. Hopefully that can be put up on the screen.

(Andrea Giampoli sworn.)

CHAIRMAN FINNIGAN: State your name and address for the record.

MS. GIAMPOLI: Andrea Giampoli. 1 South Wacker, Suite 1800, Chicago, Illinois, 60606.

MR. KURITZ: If she has the PowerPoint available beforehand like the last witness did, that was quite helpful to have that handed out beforehand.

MR. GRIFFIN: We don't.

MS. GIAMPOLI: I apologize. Sorry about that.

MR. ZIMMERMAN: So we have to turn around. Pardon our backs, everybody.

MS. GIAMPOLI: Good evening, Board. You can actually move to the next slide here. Again, my name is Andrea, and I am the environmental and wildlife permitting manager at Invenergy. I've been with

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Invenergy for three years, and I've worked on this project since its beginning, when we began to do environmental studies on it in 2016.

I just wanted to walk through the environmental surveys that we've done in the project and walk you through the process that we followed to do those and then also go through the results that we have, which are also available in our application. All of the full reports that were issued by our consultants that prepared the work are all available in the application as well. So further details are available there.

I want to start by saying that this isn't the first project we developed in Illinois. It's not the first time that we've communicated with the Illinois Department of Natural Resources or the United States Fish and Wildlife Service. We have a long history of working with them in coordination on nine or ten projects here in Illinois.

We've done a lot of great conservation work in Illinois as well. I just want to highlight that to start, to just kind of set the stage that basically we have this ongoing relationship with the agency staff here in the state. That is kind of the basis for the

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relationship we built about this project specifically.

So this is just a list of the conservation and research projects that we've done in the last few years here. We had the Blackball mine, Indiana bat migration studies that we've done. As you can see, these studies have been done throughout the state, in LaSalle County, Vermilion County, Henry County.

We've done a lot of bat deterrent research. In my position, I'm really trying to make sure that our projects completely minimize their impacts to wildlife and to natural resources. So we are constantly at the forefront of trying to understand what we can do in our industry to push the ball even further and improve the technology so that we're not just relying on siting of our turbines away from natural resources, but we can also employ operational strategies and potentially these new innovative technologies such as deterrence to deter bats from the turbines.

We've been involved in studying bats as well as eagles in the state. In LaSalle County, we've tagged four bald eagles with telemetry packets; so we are tracking their movements throughout the state and near to one of our other operating facilities in

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LaSalle County so that we can understand the interaction with eagles and how they fly near wind turbines. If we can better understand that, then maybe we can more responsibly site turbines in the future.

So we really want to promote a clean energy future that's also compatible with the wildlife, the wildlife that we love so much, and all the natural resources that we have here in the state.

I just wanted to highlight that to start. We can move to the next slide.

When we go out to figure out where we are going to build the newest -- our next wind facility, we follow a tiered approach. The tiered approach is one that's been recommended by the United States Fish and Wildlife Service. They've actually developed a document that outlines this tiered approach, and it's called the "Land Based Wind Energy Guidelines."

It offers this approach to basically assessing a project from very early on, when we're trying to figure out where we should build that project, to studying the actual project area itself to then later, after the project is built, studying impacts to the wildlife, comparing the studies that

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we've done in preconstruction.

In our assessments before the project is built, we're trying to figure out, you know, what impacts may we have. Then after the project is built, we look at those impacts and we see: Were we close? Were we right? Is there anything we should do in operation that can affect or change -- you know, basically, if we had more impact than we were anticipating, what can we do to bring that back to what we were anticipating.

So it's this step-wise approach to assessing the project. That continues on through the whole entire operation of the project through the decommissioning. It involves, on to tier 5, basically continuing research, which is what I kicked off with, some of the ongoing research that we have as well.

So we follow these tiers. Tier 1 is basically, like I said, the preliminary site evaluation. You'll see -- I'm going to walk through the tiers that we followed on this specific project, in particular tiers 2 and 3 that we followed so far during our preconstruction surveys.

We also have followed the United States Fish and Wildlife Service Eagle Conservation Plan Guidance,

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which is another document that was published by the Fish and Wildlife Service that outlines the methodology and protocols that it recommends we follow to study the impacts -- potential impacts to eagles.

So we followed the approach that the Fish and Wildlife Service has recommended, and we've worked closely with the local field office in doing so.

Next slide.

That's a good segue into the agency consultation that's been conducted on this project. With the fish and wildlife service, we've had three different consultation meetings. The earliest was held in March of 2016. We also met with them in February 2017 and again in October 2017.

In these first meetings, the one that was held in March 2016, we discussed basically the methodologies that we were planning on following in conducting the research. That was at the very beginning of when we started to study wildlife on site and started to look at the natural resources in the project area.

So we basically go to the Fish and Wildlife Service office and say: This is the protocol we're planning on following. Do you have any feedback on

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that? Is there anything that we should change?

But generally, because we have this longstanding relationship with them and we've been through this before and because we're following the Wind Energy Guidelines -- that's a document where they set forth all of their recommendations -- we're typically in line with one another.

They see where exactly we're looking to build, and they can make recommendations about things we should be thinking about, specific species we should be thinking about. Then we basically move forward. We conduct the surveys. Then we meet with them again at the tail end of the first year and say: Here's the results. Here is what we have found in those surveys.

Then if there's anything that seems surprising or anything we weren't anticipating, should we think about doing any additional surveys? Are there any species we weren't anticipating? Maybe we should look into that species further. That's when we have those conversations, and we figure out whether or not anything additional needs to be done.

Then we kind of continue that conversation as the project continues to be developed. That's when

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we most recently had a conversation here in October 2017 in finalizing our results.

We still have some large bird avian use surveys that are ongoing. It is our protocol to conduct two years of preconstruction avian use surveys, as recommended by the Fish and Wildlife Services in the Eagle Conservation Plan Guidance.

It sets us up to have all the data that we would need to make a determination about whether there's eagle risks at the site. If there was, then we would have the data we would need to move forward with, potentially, a permit process.

Then we also followed the -- completed the consultation with the Illinois Department of Natural Resources. That process is different in that we submit the EcoCAT request that they have. We basically submit information about the project area, the project area map, and then the DNR responds with recommendations that they have about the project. Those recommendations actually go to the county, and then we have the opportunity to respond on our behalf. An we've done that.

You can move to the next slide.

So this is an overview of the natural

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resource and wildlife surveys that we've done for the project, starting as early as March 2016.

The WEG tier -- that's the Wind Energy Guidelines tier -- that it corresponds to, so the tier 1 and 2 surveys, the very preliminary looking at which area in the state, which area, you know, in the country? Where should we be building? Where does it look like we're going to have a very low impact? We start with that very preliminary site assessment.

Then the site characterization is looking more in detail in that project area itself. What resources do we have in the project area? A site characterization full report is in the application if you want to look into more detail of what protected areas we have in site, what potential species we have on site. That's all included in that document and in that assessment.

Then we have the tier 3 surveys that have been conducted. The raptor nest survey, where we're looking for raptor and other large bird nests such as eagle nests, we conducted those surveys both in spring of 2016 and spring of 2017.

We conducted a small bird use survey. So we're looking for small passerines. That survey was

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conducted in March of 2016 through November of 2016. It's a monthly survey.

We also conducted large bird use surveys. In those, we're looking more for waterfowl and large raptors and eagles. That's the survey that I mentioned has been conducted here for almost two years now.

And then the tier 3, a bat acoustic survey where we're looking at bat activity. That was conducted through the full bat active season in 2016.

You can go to the next slide.

Just generally, this is going to -- one part of the site characterization is looking at the different land cover types in the project area. As you can see from the image here, the brown is cultivated cropland.

This really is a largely cultivated, cropped, previously disturbed project area. That's why it was attractive to us, especially those on my team and the environmental team. We really like a site that is predisturbed so that we're not impacting pristine wildlife or impacting sensitive species because, really, it's my goal to make sure that we're not having impacts to sensitive species, especially

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those that are state and federally threatened as protected -- threatened/endangered. Sorry about that.

So as you can see, it's largely cultivated. It's attractive to us.

And we can move on to the next slide here.

So this shows the results from our raptor nest survey. Just really quickly, the methods that we follow on the raptor nest survey, we actually hire a plane. We put a biologist in a plane, and they fly all of the suitable habitat out to ten miles beyond our project boundary. We're not just looking in the project boundary itself because we know that eagles and large raptors fly beyond that; so we look out to ten miles.

This image here, just so you can see it a little bit more clearly, is limited to our two-mile buffer. We actually search for all eagle nests out to ten miles. We look for all raptor nests, including eagle nests, out to two miles, including the project area.

You can see here that we surveyed the project both in 2016, and then we checked again in 2017 because we want to see what kind of changes are being made. Are there a bunch of new nests in a year

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that we should be aware of? We don't just look once, but we want to make sure that we're keeping an eye on those nests and, if they're occupied or no longer occupied, that we keep a record of that.

We found 24 nests total in both years. There were ten raptor nests within the current project boundary, only three of which are actually active nests. So they actually saw that they were being incubated by birds. This study is conducted in the nesting season so that -- it's also before leafout so that basically we can more easily see into the trees if there are nests there. That's why that's conducted in March and early April.

There was one bald eagle nest found in our surveys. It was four miles outside of the current project boundary. You can't see it on this map, but it's basically directly west of the project area.

Next slide.

This image just gives you an idea of how comprehensively we cover the project area with our avian use surveys. What you're seeing there is basically each 800-meter-radius plot in which we -- if you can imagine, we put a biologist in the middle of each one of those circles; and we limit their viewshed

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out to 800 meters because that's basically about as far as they can see. They stand at the center of each one of those circles one time per month for 60 minutes. What they're doing during that 60 minutes is counting how many large birds that they're seeing fly by.

So they're keeping track of all the species that they're seeing and for how long they're seeing them, how many different observations, how many flocks. So they're spending a lot of time out there.

I don't want to confuse you. I was just mentioning the large bird use surveys. Up here, we have the small bird use surveys. Those are conducted in the same circles, but actually the viewshed is smaller because the birds are smaller. So the biologist stands at the center of one of those circles but only looks out 100 meters. They record everything that they see and hear. It can be things that they hear beyond 100 meters, but we limit it because the small birds can't be heard as far.

Then we limit those to also eight-minute surveys because we hear so many in that time. We get a really good idea of species composition by limiting those surveys to eight minutes. Those are conducted

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14 times a year so that we can actually conduct more in the migratory periods when we have more species out to make sure that we're getting a very complete list of what species are in the project area.

So for the small bird use surveys, we were standing out in the middle of those plots for 67.2 total hours, just collecting bird data. Then for the large bird use surveys, like I mentioned, those are conducted monthly for an hour over the course of -- since March 2016, we've counted -- or basically been out there observing for 903 hours; so it's a lot of time spent in your neighborhood looking up at the skies. So we have a pretty good idea of the species composition of the small and large birds in the project area.

We also -- we separate out -- we have -- all the plots are very well distributed throughout the project area. They actually cover 30 percent of the total project area, which is one of the recommendations under the eagle conservation plan guidance, but also lets us -- really gives us a good idea of both spatial and temporal use of birds in the project area.

If we are seeing, you know, in one

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particular area that there's a certain species, sensitive species, that hangs out a lot, we can think about that in siting the project, maybe site our turbines away from that area where we're seeing a lot of sensitive species.

Move to the next slide.

This is just quick survey results. These are again in the application. But for anyone that's interested, we saw 46 different species of small birds, the most common species being the European starling. We did not see any federally protected small bird species. We did see one state endangered species, but that species was actually observed now in a location that is five miles east of the nearest participating parcel. There was only one observation in July. So the project is being sites away from where that observation was.

These are the results of the large bird use surveys. We saw, in year one, 41 different large bird species, in year two, 35 different species. You can see the most common species listed here.

We did have 14 observations of bald eagles in the project area. Like I said, that was over the course of 900 hours, but it's been helpful to see kind

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of where we see those bald eagles flying around. We can think about that in the siting of the project. Then we also saw three state-listed species, the Upland Sandpiper, the Northern Harrier, and the short-eared owl.

Move to the next slide.

We also conducted a bat acoustic survey. Generally, the objective of our bat acoustic surveys is to understand basically the seasonality of when bats are on the landscape so that, if we do need to employ or we decide to employ a curtailment strategy, we have a good idea of when bats are coming onto the landscape and what time of year they're leaving the landscape and when they're most active and what type of habitat they're most active.

So we have an acoustic detector that we put in forested habitats, a very suitable habitat for bats in the summer because they generally stay within forested areas. And then we put one in a field in a MET tower so that it's more similar to where we would have a turbine. It's more in the middle of -- it's further from a suitable habitat.

So we see different activity peaks in the different types of habitat. In the fall, the activity

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peaks at the MET towers because that's during the bat migration. So they're actually flying over the landscape, and they're not staying so much in the forested areas like they do in the summer. In the summer, that's why you see more activity there in the forested areas.

So out of the 24,000 plus passes that we recorded, just 12 of them were identified as Myotis, which is -- basically the state and federally protected bat species are both Myotis species. That's why we call out that type of species, to really understand: Do we have protected bat species in the project area? Should we be concerned about that? Do we have a lot of forested area in the project area? In some projects, we have more habitat; so we need to really be thinking about what we should be doing for bats, both in the summer and fall.

95 percent of the passes were recorded at the forest detector; so we're seeing a lot of activity in the forested area but not as much in the middle of the fields throughout the year.

Next slide.

I just want to -- some of the habitat setbacks that we've applied in this project include

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the 1,000-foot setback from what we've identified as suitable foraging and roosting habitat for bats. That's the bat summer habitat. We make sure that we set back from that so that we're minimizing our impact to that.

Then we also apply a 1,000-foot setback from active raptor nests we identified in the project area so that we're really setting back and minimizing our impacts to both raptors and bats with those setbacks.

That really concludes my slides. But generally speaking, we selected the project area because it was mostly previously disturbed cropland. We found very little in sensitive natural habitat in the project area. So we're pleased to be and hope to be building in this area.

CHAIRMAN FINNIGAN: I think we are up to questions from the Board.

MR. ZIMMERMAN: You mentioned the different types of bats. You had 24,000 passes, and one was the particular relatively rare species?

MS. GIAMPOLI: I said there were 12 within the genus Myotis. There are actually several species that are in genus Myotis, which includes bats that are not protected. But the two bats that are protected

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are also Myotis.

So we look at that, but it doesn't tell us necessarily that those Myotis species that we saw in the project area were the Northern Long-eared Bat or the Indiana Bat, which are the two protected species. There are species such as the little brown bat, which are Myotis, that are not protected. But because they fall under that genus, we look specifically at that.

MR. ZIMMERMAN: Are you distinguishing these with the acoustics?

MS. GIAMPOLI: With the acoustic software, yes.

MR. ZIMMERMAN: So you can tell one bat from another by the acoustics?

MS. GIAMPOLI: They can tell down to the genus, yes.

MR. ZIMMERMAN: How far away from -- you suggested 1,000-foot margin away from the habitat; is that correct?

MS. GIAMPOLI: Yes.

MR. ZIMMERMAN: That would be essentially avoiding a lot of the -- the habitat is largely linked to the creek -- the Mackinaw River and the attendant creeks?

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MS. GIAMPOLI: Correct. The Fish and Wildlife Service has the Indiana Bat Summer Survey Guidelines in which they define suitable summer habitat for the Indiana Bat, which is very similar to the Northern Long-eared Bat, which are both protected species; so we follow that definition. It's a specific type of -- you know, it's treed area. It's riparian corridors, areas where the bats can easily find insects. There's a certain definition on -- a certain number of trees, a certain width for the bats to kind of crawl up under during the day.

We basically map throughout the project area all the potential suitable summer habitat for bats, and then we apply a 1,000-foot setback from that habitat. And, yes, it includes a lot of the riparian corridors, creeks, especially the creeks with vegetation, because those fall under that suitable bat habitat definition.

MR. ZIMMERMAN: On the raptors, did you consult with the people who do the annual raptor survey in McLean County to get a census of the raptors?

MS. GIAMPOLI: In the site characterization survey, we access a lot of different databases, public

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databases. I can't recall if they accessed specifically the McLean County raptor results. I'm not sure which group you're talking about specifically. But they do try to access as much of the publicly available raptor data as they can specific to local groups and Audubon groups, Christmas counts and local bird counts and hot watches, whatever data they can collect from the County.

MR. KURITZ: With as many projects as Invenergy has had, what type of issues have you found as far as interaction between having the wind turbines and the species that you just studied?

MS. GIAMPOLI: I guess specifically what kind of issues are you -- could you rephrase that question?

MR. KURITZ: Do they tend to get killed a lot, or does it disrupt their nesting?

MS. GIAMPOLI: The species that I'm most -- that I look at most closely are bats and birds, especially, you know, state-protected, federally protected birds and eagles.

We are doing everything we can to minimize our impacts to birds and bats. But there are -- just by the nature of operating, wind turbines do cause the

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mortality of birds and bats. So what my job is is to minimize those impacts to the greatest extent possible. That's what we're trying to do here.

MR. BANGERT: So even with the 1,000-foot setbacks, what would be a head count, if you will? What are the impacts? There has got to be statistics out there for utilizing a 1,000-foot setback for bats and other birds of prey and just any type of bird.

What would be -- and maybe "head count" is a terrible word to use. But what is the impact there in real numbers? Do you have that?

MS. GIAMPOLI: I don't. I don't have statistics on impacts or the effects of that setback. That setback has really been accepted as an industry standard. It comes out of Fish and Wildlife Service Guidelines definition of habitat and basically how far out bats are willing to fly from their protected covered foraging area.

So I don't -- it would be difficult to conduct a study to really understand -- that would be a difficult study to conduct, and I haven't seen it done; so I'm not aware of the statistics.

What I will bring up is just some of the additional practices that we have in making sure we're

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minimizing impacts. Some of the best management practices that we have include -- you know, the eagles are most attracted to -- are typically attracted to project areas, especially during the wintertime, to carcasses. They feed on road kill and carcass dumps and things like that.

So even when we're looking originally at our project area and the location of them, we're making sure we're aware of where those are and we're also aware of those practices. We do try to work with landowners in improving those practices in dumping carcasses so that we're minimizing the attraction of eagles into the project area as well.

MS. TURNER: I would like to discuss your response to the IDNR's recommendations. Are you prepared to do that? Have you been involved in that?

MS. GIAMPOLI: Yes.

MS. TURNER: Probably the best way to go through would be for you to say, you know, what your response is to each one of their recommendations and why that is.

MS. GIAMPOLI: Sure.

MS. TURNER: Recommendation number 1, you've agreed to that, which is slowing the turbine speeds

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down specifically during the bat -- the high bat activity time of July 15 through October 15?

MS. GIAMPOLI: Yeah. The DNR recommended curtailing turbine operations below wind speeds of 5.0 meters per second during the period of July 15 through October 15, which is the bat migratory season. And, yes, we agreed to do that.

MS. TURNER: Then on the imposing a requirement -- they're recommending that they impose a requirement to conduct three years of mortality monitoring to quantify bird and bat mortality. And you guys have agreed to one year because, in your experience, you found it's similar to the first year.

MS. GIAMPOLI: Correct.

MS. TURNER: Can you talk about some of that experience and the number of experiences you have there and why you think it would be the same? Instinctively, I think migratory -- I know birds are very habitual.

MS. GIAMPOLI: Right.

MS. TURNER: But I would think that some years would be -- there would be more than others in a given year.

MS. GIAMPOLI: Right. It used to be that

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the standard was conducting the full three years; but because there was such similarity in the three years and also just so much -- you know, across the industry, so many companies conducting the data, that we do have a really good idea, generally speaking, what the impacts are going to be.

So, you know, it didn't make sense to continue to collect the data, to spend the money collecting the data, just to collect it, just to kind of confirm the date that we already had. Instead, reallocate those funds towards other, you know, research or to conservation. That's why the industry has kind of moved back toward doing one year and trying to look at, you know, reallocating those funds to other resources.

MS. TURNER: And this is because the wind farms have been around a lot longer now and you feel like you have more data to compare the one-year collection that you would have as to whether that's high, low?

MS. GIAMPOLI: Correct. And then we also train all of our operation staff members -- those are actually working on the ground, the technicians that are working on the turbines every day -- in wildlife

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detection and recording. So they basically will report to us any carcass that they see at any time so that it's immediately reported to us within 24 hours, to us internally, to my team.

Then it's my job immediately to make sure that we are ID'ing that carcass so that we're aware of whether or not it's a protected species or not. That's all recorded. If it is a protected species, then we also report that to either the Fish and Wildlife Service or IDNR, depending on the entity it's protected by.

MS. TURNER: Is this also how you would -- if migratory patterns were to change -- I assume they're not stagnant. So if migratory patterns were to change and this wind farm did impact that, how would we know that?

MS. GIAMPOLI: Right. Exactly. So when we have these reports coming in, then we know -- if we're seeing -- kind of just every once in a while we're getting a report, that's kind of the norm. If we're starting to get more reports or we see kind of a large -- you know, we see more than one carcass at the same turbine, then we know that there's something that's different there. That's when we'll go and investigate

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that.

MR. ZIMMERMAN: How many reports have you received from the wind turbines? You've trained the staff. They are supposed to report. How many reports have you actually received?

MS. GIAMPOLI: I actually don't know that off the top of my head. We have a large fleet. So I'm receiving reports across the fleet. I also divide -- there's division of labor between me and my colleagues who cover our operating fleet; so I couldn't give you kind of an accurate number of how many reports are coming in nation-wide or anything like that.

The number would be somewhat arbitrary, probably, to you because it would just be those projects that I'm working on. You know, they're coming in -- I can't say exactly how regularly, but not that regularly.

MS. TURNER: Then recommendation number 3 is that we consider imposing a requirement for you to perform and report fish and mussel surveys of 100 meters up and downstream, and you guys don't agree with that one.

MS. GIAMPOLI: That one, we just found,

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would be something that would be covered under the jurisdiction of the Army Corp of Engineers. If we were actually going to impact a stream, that would be covered under conditions that we would have with any permitting with them.

We also have a storm water and pollution prevention plan, one that has erosion control measures that we also follow. So we just didn't think that an additional requirement was necessary.

This requirement has also been -- recommendation has also been made by the DNR in the last few years on wind facilities. To our knowledge -- I don't know how often the County further recommends them to the Applicant.

MS. TURNER: Their thought behind recommending this, I would assume, would be because you are disturbing the land. And I know you have conservation and erosion guidelines. But would you assume that they're recommending this so they could make sure that those are good enough to not impact these mussels and things?

MS. GIAMPOLI: I'm not going to assume, I assume, what their reasoning is.

MS. TURNER: I just wanted to make sure I

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was being logical there. All right.

The same thing for tracking surveys for mudpuppy salamander. And I think that your -- oh, go ahead and explain your reasoning there.

MS. GIAMPOLI: Yeah. We're just not aware of any publicly available scientific data that supports that wind turbines themselves in their operation have any effect on salamanders; so that's not a species that we believe we need to look any further into.

MS. TURNER: I assume that wind turbines have been near aquatic species before. And here you guys say that you aren't aware of any -- that it impacts aquatic species.

Are you aware of how many studies have been done, or what do you base this on?

MS. GIAMPOLI: No, we're not aware of any studies that have been done.

MS. TURNER: Then number 5 is that the Department recommends the County consider imposing a requirement for the Applicant to avoid siting turbines within 500 feet of a perennial stream. You say that you don't believe this recommendation is necessary. Can you elaborate on that a little bit?

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MS. GIAMPOLI: Correct. I mean, if you mapped all the perennial streams throughout the project area according to the National Hydrology Database, there's some 49 miles of perennial streams throughout the project area.

I think that, if we actually put a 500-foot setback from the streams, the question would be: What would we be achieving from that?

You know, we've applied a setback from the high-quality stream areas that have vegetation. Those are falling under the suitable bat habitat, which is basically riparian corridors with vegetation. So we find that our setback from that habitat is sufficient to cover the goal of what is trying to be achieved here.

MR. ZIMMERMAN: To what extent do bats follow the perennial streams? Because you have riparian areas that have greater vegetation in them that might attract the species, typically mosquitoes, that bats would feed on. To what extent do bats track the perennial streams?

MS. GIAMPOLI: As long as there's some sort of vegetation cover, it will typically fall under that definition of suitable foraging habitat. If it's

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completely open without any cover, then it might not fall under that definition.

MR. ZIMMERMAN: So the streams that are -- what's the phrase here? A perennial stream. So a perennial stream has a riparian habitat; so it would be a more likely habitat for bats. And so you're saying MWEC does not believe this recommendation is necessary to keep turbines away from what is essentially bat habitat area. I'm trying to figure out what's going on there.

MS. GIAMPOLI: No. We've applied the 1,000-foot setbacks from the riparian corridors with the vegetation, which may encompass some of these perennial streams, the higher-quality perennial streams that have the vegetation cover.

Another point that we've made here is basically that a lot of the perennial streams in the project area, we believe, have been modified for agricultural purposes. And so, like I said, what would we be achieving from setting back from them? What are we looking to avoid?

MR. ZIMMERMAN: I want to go back to question number 3. We can do that right now. So you're familiar with the Mackinaw River. I believe

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it's on the Illinois Natural Areas Inventory by having a rich number of species of fish and mussels and other things there?

MS. GIAMPOLI: Correct.

MR. ZIMMERMAN: So your recommendation is that they don't do fish and mussel surveys after they disturb the water. So they go muddy up the water, and they have a whole bunch of dirt going up and down changing the habitat along the river; but you're recommending that that doesn't impact aquatic species?

MS. GIAMPOLI: We've applied --

MR. ZIMMERMAN: We would know that they're disturbed by the number of fish and mussel species that are in those particular areas.

MR. PARZYCK: If I may respond? Kevin Parzyck. You were mentioning the Mackinaw River, the stream. We are not going to be building in that area. In other words, I think it has to be clear as to where we're building and what we are disturbing or, for that matter, not disturbing.

So would you explain that we are not building or will not disturb the Mackinaw River?

MR. ZIMMERMAN: So you have essentially no problem with DNR recommendation. If you're not going

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to disturb it, then you could say, sure, we don't have any problems having a requirement that you perform fish and mussel surveys when you disturb it.

MR. PARZYCK: It depends on what -- this would be any stream up in the middle of an agricultural field, not necessarily the species-rich areas of the Mackinaw River or that --

MR. ZIMMERMAN: So none of the underground tubes with all of the electrical conduits will be going across anything relating to the Mackinaw?

MR. PARZYCK: That's correct. Our project is north of the Mackinaw.

MR. ZIMMERMAN: And sufficiently away from the Mackinaw that none of the disturbances of the waterways would have a disturbance on the Mackinaw?

MR. PARZYCK: That's correct. One other point you were mentioning, the underground cables. Anytime we would be taking underground cables even to streams in the middle of a project -- or creeks -- we will directionally bore. So we will not disturb the stream bed. Even a small insignificant stream, we will directionally bore under those.

MR. ZIMMERMAN: All right.

MS. TURNER: Then the sixth one is that they

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recommend that no wind turbines are sited within one-half mile of the Mackinaw River Land and Water Reserve, which we talked about. You said here that you're not disturbing that.

And you said that 115 of 117 turbines are more than a half mile. Is this correct? So there's two that are within a half mile?

MS. GIAMPOLI: Correct. Correct. In our response, we said that, if the Board makes the recommendation that we don't have any within one-half mile, that we would consider that.

MS. TURNER: Then the final one is regarding the Franklin Ground Squirrel and performing trapping surveys. Your response to that one?

MS. GIAMPOLI: Just that, you know, the DNR had noted the species not within the project area, and we are also just not aware of any publicly available scientific data that would suggest that shadow flicker would impact the species, especially given that it spends more than half the year underground.

MS. TURNER: So you're saying that one spends a lot of time underground, and you don't think the shadow flicker -- and the reason they would want that study is for the shadow flicker, to see if

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there's a shadow flicker impact on that?

MS. GIAMPOLI: Correct.

MS. TURNER: Thank you.

CHAIRMAN FINNIGAN: Is there any other questions from the Board?

(No response.)

CHAIRMAN FINNIGAN: How about staff?

MR. DICK: Yes. In number 3, you indicate that there may be conditions required by the Army Corps of Engineers. Have you received any conditions from the Army Corps of Engineers?

MR. PARZYCK: We have not received any recommendations. None of the turbines that we would be installing would disturb any streams. The potential that could happen is if we were to locate an access road that would require, say, a culvert through a stream; that would be a requirement that we would then go to the Army Corps and look for any approvals.

However, if there's a minimal disturbance, there is a nation-wide permit that allows a culvert to be put into a stream.

MR. DICK: Okay.

CHAIRMAN FINNIGAN: At this time, we can have questions from the audience, if you want to come

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forward. State your name and address.
MR. SCHWASS: Good evening. Glen Schwass, 27709 North 2550 East Road, Lexington.
So it's been a long night. And I think you stated earlier in the statements -- Invenergy, would you consider yourself on the cutting edge of environmental studies and that you do a thorough and complete study of the environment?
MS. GIAMPOLI: We would. I would.
MR. SCHWASS: My question then is this. I've heard a lot about the fish and the wildlife environment. It was a question that I posed back in the gentleman before you on the studies of leisure animals.
I didn't hear or see anything or no discussion on horses, cattle, swine, poultry, and/or family animals. How does it impact -- these turbines, again, I'll ask: How does it impact all of these animals, or have you ever studied those animals' behaviors and reactions to those towers and the movement?
MR. PARZYCK: In our discussions with the Fish and Wildlife Service and DNR, we are investigating any species, any information that they

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provide, not just on avian species, but as well as ground species.
The experience we have had through our installation of projects to date, as well as our competitors and others across the country, there has not been impacts that we have seen to these various animals; and the wind turbines are operating in a variety of environments, both farmlands and other grasslands, et cetera, is compatible with the existing species.
In addition to that, there is no published data, peer-reviewed data, indicating that there's a correlation between the tens of thousands of wind turbines that have been installed across the country and the world and any impacts on these species.
MR. SCHWASS: So you wouldn't be opposed to studying those species because of the impact it could have on them? I mean, I look at horses and/or family pets, dogs, cats. They are very conscious of their surroundings.
The question is: If you're that thorough, why wouldn't you be studying those types of animals?
MR. PARZYCK: We are studying them with our existing wind farms on an ongoing basis. We have

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anecdotal evidence with these tens of thousands of turbines that there is no impact. In other words, we are not seeing people coming to us saying: We are having problems with this species or this species. So there isn't a need to investigate further because there's no evidence of a problem.
MR. SCHWASS: So if somebody did come to you with an issue like that, how would you address it?
MR. PARZYCK: We would investigate -- we would follow a protocol where we would investigate: Is that pervasive throughout the area? We would go down that path of studying it, yes.
MR. SCHWASS: So you're a large company. I'm a small landowner. What would be my percentage success if I came to you with a problem like that that we had seen in an animal? What would be my percentage of success of getting some kind of resolution to that in a timely manner?
MR. PARZYCK: Well you're putting a very wide-open hypothetical out there. But as a large owner and operator of wind turbines, our goal is to make sure that our turbines have minimal impact to the community. If there's a problem, we fix it because we want to make sure that the community is satisfied.

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Now, what that takes, what you would be required to satisfy, it's a hypothetical. I couldn't even say what problems you would have. I mean, if you want to give me something specific that you have seen happen in the past, I would be happy to investigate:
MR. SCHWASS: Again, I don't have turbines all over my property, but horses are very finicky. They're going to react to that somehow.
MR. PARZYCK: But the history is tens of thousands of turbines across the country; there is no problem.
MR. SCHWASS: So corrective action would be obtainable?
MR. PARZYCK: That's correct.
MR. SCHWASS: So another question: You've stated in there -- well, let me back up. Have you done any seismic studies in this property or this land that's around the turbines that are being presented?
MR. PARZYCK: From a structural perspective?
MR. SCHWASS: Seismic studies of the ground.
MR. PARZYCK: We have structural engineers who design our foundations, and the turbines are designed structurally to resist -- generally in this kind of environment, the wind load is going to be

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higher than any seismic impacts.
MS. SCHWASS: I ask that question because of a comment that you made earlier, and that is that you directional bore under these waterways or such.
How would you know that you're not impacting the ground if you don't have any type of seismic study? Because when you directional bore, you're disturbing the ground.
MR. PARZYCK: I'm sorry, I don't understand how you relate earthquake issues with directional boring.
MR. SCHWASS: I'm not talking earthquake issues.
MR. PARZYCK: That's what seismic is.
MR. SCHWASS: Seismic studies the ground to see the stability of your ground, your different levels of the soil, all that other stuff.
MR. PARZYCK: No. I'm sorry. Seismic is earthquake.
MR. SCHWASS: Okay. Well, okay. X-ray the ground. I don't know the technical term. You're looking at the ground and looking at the environment. You said directional boring doesn't disturb it.
The question would be: How would

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directional boring not disturb --
MR. PARZYCK: No. No. I'm saying -- the directional bore comment was with respect to creeks that we directionally bore under so that we do not trench through the creek bed.
MR. SCHWASS: So in your directional boring, 34,000 -- your comment is 34,500. It's 34,500 volts underground. Does that not emit some type of a harmonic that could disrupt the fish or the wildlife or the mussels in that water?
MR. PARZYCK: It does not.
MR. SCHWASS: How does it not? I mean, it's putting out that type of a harmonic.
MR. PARZYCK: It's a grounded -- three-cable grounded system, heavily insulated both by the insulation around the cable itself and the surrounding soil that it's in. Any electromagnetic dissipates very quickly beyond that.
MR. SCHWASS: But it does emit out beyond the cable a little bit?
MR. PARZYCK: Yes, it would.
MR. SCHWASS: So it could impact the fish and mussels?
MR. PARZYCK: There is no evidence that it

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does.
MR. SCHWASS: Are the turbines -- do they have oil in them?
MR. PARZYCK: The gear boxes do have oil in them, yes.
MR. SCHWASS: Have you ever experienced a leak of the oil?
MR. PARZYCK: I don't have any information on that. I can't say one way or the other. It's possible.
MR. SCHWASS: So if the oil leaks, it could get to the ground. Gravity is going to take it to the ground.
MR. PARZYCK: One would assume.
MR. SCHWASS: Are there wells drilled? I didn't hear anything about any water wells or anything like that.
MR. PARZYCK: No, there's no wells drilled.
MR. SCHWASS: There's no wells drilled within any of the turbine surroundings to use for coolant or anything like that?
MR. PARZYCK: No. The impact at the turbine itself, the foundation is excavated down about 10 feet. But there are no wells or anything like that

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around. Nothing is required. Water is not required at the turbines.
MR. SCHWASS: What would happen if oil did leak and get into the soils which got into the ground surface and the water?
MR. PARZYCK: We would have an environmental situation that has to be rectified in accordance with the EPA.
MR. SCHWASS: Have there been any impacts on wells because of turbines?
MR. PARZYCK: I'm not aware of any. I'm not quite sure how it would.
MR. SCHWASS: Again, I don't know. We rely on a well; so it's a concern.
MR. PARZYCK: In all of our existing projects, we have not seen any impact. Since the turbines are only -- the foundations only go down about 10 feet, you're not getting anywhere near the aquifer.
MR. SCHWASS: Do you do the studies? I heard of all the studies that were done in the areas that these turbines are going. Have there been any studies after the turbines have been up with everything that you just talked about?

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MR. PARZYCK: You mean our existing projects?
MR. SCHWASS: Yes.
MR. PARZYCK: Yes, we do -- those are the studies that Andrea had said originally we were doing three-year studies and we've scaled them back to a single year of study.
MR. SCHWASS: My last question -- and I may be a little bit off base -- but are you familiar with Fermilab?
MR. PARZYCK: Yes.
MR. SCHWASS: And Fermilab is an extremely environmental-conscious company.
MR. PARZYCK: I know they're a federally controlled agency.
MR. SCHWASS: So the Fermilabs, they study all of those things that I just mentioned in addition to the habitat of butterflies and things like that.
If you're that thorough and cutting edge of technology and environment, why wouldn't you be studying those types of issues when you're impacting the environment, such as Fermilabs does?
MR. PARZYCK: Fermilab is a facility in suburban Chicago. I'm not quite sure what the context

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is.
MR. SCHWASS: What they do impacts the environment, and what you do impacts the environment. So they're taking it to the next level and studying all these things. My question would be: Why wouldn't you then as well?
MR. PARZYCK: As we are. We do study that. I think Andrea had maintained early at the beginning of her presentation the various research work that we do and our ongoing efforts with our existing staff on any impacts that we observe on an ongoing basis.
MR. SCHWASS: You don't address the horse, the cattle, the swine, the poultry, and the family animals as well as, like, the butterfly and the habitat like that, which they do. My question is: Why wouldn't you go to that level?
MR. PARZYCK: Because there's not a problem. What would you study if there's no problem?
MR. SCHWASS: Again, we don't know if there's a problem.
MR. PARZYCK: We do know there's not a problem because we have operating facilities.
MR. SCHWASS: Well, no. You stated that you weren't aware --

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CHAIRMAN FINNIGAN: I think it's asked and answered. We're going to have to move on.
MR. SCHWASS: Okay. That's find. I just want to make sure it's on the record that we would like a thorough study if this is going to be moving forward. That's what I'm trying to accomplish here.
Thank you. That's all the questions I have.
CHAIRMAN FINNIGAN: Anyone else have questions?
MR. PITZER: Jim Pitzer, 29485 East 2100 North Road, Colfax.
I don't dispute the fact that you guys do survey after survey after survey. But Andrea, I think I heard you say that, if there's a problem in one of the areas, you come out and you conduct another survey. Is that correct?
MS. GIAMPOLI: I guess it depends on what kind of problem you're talking about.
MR. PITZER: Well, if you have -- I don't know. You said you do a survey for the site selection; and then, after you do that, you come back a year later and do a survey in terms of the impact on the environment or on the wildlife or whatever?
MS. GIAMPOLI: Right.

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MR. PITZER: My question is then: When you find out that you do have an impact on the wildlife in the second survey, what do you do then? Do you have another survey? I mean, when do the surveys end and you do something about it?
MS. GIAMPOLI: We use our surveys to help guide us through siting and making operational decisions.
When I mentioned that, what I was getting at was, you know, if there was something that we didn't -- we weren't aware of that was in the project area, for example, a parcel of native prairie where there were protected butterfly species, if we identified that -- that was something that we hadn't been anticipating and then we identified that that existed in the project area, then we would follow up and do additional surveys in that area.
MR. PITZER: So you do another survey?
MS. GIAMPOLI: We do another survey to assess that, which will further information whether or not we would need to --
MR. PITZER: Which then results in what, the second or the third survey or however many surveys you're ending up doing?

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MS. GIAMPOLI: It helps inform our siting decisions and operational --

MR. PITZER: But the site is already there, and it's already up. What do you do then? I don't mean to belabor that point.

MR. PARZYCK: I think, if we see a problem, there are means by which we can modify the operation of the turbine. I think a very good example of that that both we and others in the industry have done has to do with bats.

Early on, wind turbines operated, and there were concerns of the mortality of some bats. Research has been done, much of which we participated in, to go ahead, as was recommended by the IDNR, to do curtailments at certain times of the year to mitigate any impacts that would have. Those are the sorts of things that would be done.

MR. PITZER: Okay. All right. Because you can't pick these things up and move them. I understand that.

MR. PARZYCK: Right. You would have to modify the operation.

MR. PITZER: Andrea also suggested that you don't want to impact pristine wildlife and you want to

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minimize impact. Well, that suggests to me that there is an impact.

Could you kind of give me an idea what it means to minimize impact? I mean, do you have parameters there? If you put one of these up 1,000 feet from a river, for example, and it has an impact, what do you mean by minimizing impact?

MS. GIAMPOLI: Minimize our disturbance to the sensitive wildlife species that are in the area.

MR. PITZER: But you do acknowledge that there is an impact?

MS. GIAMPOLI: There may be some impact, yes.

MR. PITZER: May be some impact.

You talked about carcass pick-up. Can you do that within 24 hours, or is that another survey you're doing to determine how many carcasses there are under these things?

MS. GIAMPOLI: That is actually what our post-construction monitoring is.

MR. PITZER: Okay. How do you do that? How do you conduct -- especially if one of these things is built in the middle of a cornfield and the corn is 9 feet tall, how do you see where there's a carcass out

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there? Do you follow the buzzards up in the sky? No, You can't do that because they're all getting killed by the wind mills. So how do you find those carcasses and make that determination?

MS. GIAMPOLI: We will clear a plot below the turbine out to a certain distance. For example, if we had a 120-meter by 120-meter box centered on the turbine, we would clear out all the crops around that area and reimburse the landowner for those crops. So we would take those out of commission for the year so we can conduct carcass monitoring.

The way that that is conducted is we hire a consultant who basically walks back and forth beneath each turbine at certain intervals. They're counting every single carcass that they see under the turbine. And then we basically add up all the -- and they survey under a select number of turbines, typically around 30 percent of the fleet. And then we'll basically extrapolate from those numbers the total impact of carcasses.

MR. PITZER: Okay. Thank you. You had a map up there of McLean County, and all the brown area that was there was all open farmland. There was just a little strip of river that ran through there.

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You said that you didn't want to impact -- or minimize the impact on pristine wildlife in those areas. Why do you even bother to put those there? I mean, this is a big county. And we've got farmland as far as the eye can see here everywhere you go. Why do you even bother to put them along rivers?

MS. GIAMPOLI: Well, we've sited 115 out of our 117 turbines more than half a mile from the Mackinaw River. We've also said that we would expect a County recommendation to remove those two turbines as well. So we've actually committed to --

MR. PITZER: Those two turbines that are on the Mackinaw River?

MS. GIAMPOLI: Correct.

MR. PITZER: You've agreed to remove those; is that correct?

MS. GIAMPOLI: What's that?

MR. PITZER: You've agreed to remove those two turbines on the Mackinaw River from your plan?

MS. GIAMPOLI: We've agreed to site them further than half a mile from the river.

MR. PITZER: Okay. Okay. Then I think I'm probably going to skip the rest of this. Thank you very much.

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MR. CAPPARELLA: Angelo, A-n-g-e-l-o, Capparella, C-a-p-p-a-r-e-l-l-a. I reside at 907 South Fell Avenue in Normal.

I just have a couple of questions. First off, you said that, of the seven IDNR recommendations, you are willing to follow 1 in 6. But as I read exhibit 7, that's only if the County makes the recommendation, which is only if the ZBA makes the recommendation. That is, if they don't, the implication is that you would not be relocating those two turbines that you mentioned or doing the bat work.

So I guess I'm questioning the "if" in the clause. It sounds like it's contingent on the ZBA and the County requiring those two recommendations. Is that what the "if" means in the clause?

MS. GIAMPOLI: Correct.

MR. CAPPARELLA: Okay. Thank you. I had a couple of questions about how you determine setback distance, the 1,000 feet.

I guess my first question: Is the 1,000-foot setback derived solely from the Indiana bat study that you mentioned?

MS. GIAMPOLI: It's the Indiana Bat Summer Survey Guidelines, which is guidelines set forth by

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the Fish and Wildlife Service for conducting summer surveys for that species.

MR. CAPPARELLA: Right. So all other species, all the scores and scores of other species, are sort of subsumed under that 1,000 foot that's been recommended for the sole species, the Indiana Bat. Is that my understanding of how the 1,000 foot comes into the picture?

MS. GIAMPOLI: Yes. So the Fish and Wildlife Service has also said that the habitat for the Indiana Bat is similar to the Northern Long-eared Bat as well.

MR. CAPPARELLA: Right. But in terms of raptor nests and other things that you mentioned -- so the 1,000 foot is linked to Indiana Bats and the raptor nests; but everything is ultimately linked to just one species, the Indiana Bat, for the 1,000-foot calculation as being the standard to use?

MS. GIAMPOLI: The 1,000 feet is what we use, yes, for the bat species. Setbacks comes from the Fish and Wildlife Service Guidelines.

The 1,000 foot from raptor nests was really just our voluntary setback that we chose. It's not based on any recommendations. It was just a voluntary

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setback that we applied.

MR. CAPPARELLA: Okay. Then I probably just got confused because it's the same number.

MS. GIAMPOLI: Right. Right.

MR. CAPPARELLA: Okay. Sorry about that.

In terms of how you measure 1,000 feet, do you measure it from the tip of the killing part of the blade, or do you measure it from the center point of the turbine? So do you measure it from where the blade attaches to the turbine, or do you start the measurement from the actual tip of the turning blade?

MS. GIAMPOLI: We measure that from the center of the turbine.

MR. CAPPARELLA: So it's not really a thousand feet from the killing part of the turbine?

MS. GIAMPOLI: I will say that you did ask me this question earlier this week.

MR. CAPPARELLA: Right. You didn't have a chance to get back to me.

MS. GIAMPOLI: I looked at our setbacks that we have applied, and all but one turbine is actually set back more than 1,000 feet. So the additional 200 feet that accounts for the turbine blade, that goes beyond the center, is therefore accounted for.

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MR. CAPPARELLA: Right. But the 1,000-foot number that's in the document is actually 1,000 feet minus the blade length in terms -- it's the blade that kills, not the center. So you're really saying that -- so I guess I'm wondering -- and I'll have to check the document -- when they talked about 1,000 feet for the Indiana Bat, did they measure it from the base of the blade or the tip of the blade?

MS. GIAMPOLI: So that number is actually -- it's not a recommended setback by the Fish and Wildlife Service. It's being pulled from the definition of habitat.

So basically the Fish and Wildlife Service is saying that the Indiana Bat doesn't fly more than 1,000 feet from its origin habitat.

So the wind industry kind of grabbed onto that and we said: Okay, well that makes sense. If they're not going to fly more than a thousand feet, then it's safe to put them beyond a thousand feet.

So that's where that -- it wasn't actually a direct recommendation for a setback by the Fish and Wildlife Service. It was that we were saying: Okay, this is a definition of habitat; and beyond that, that's not habitat.

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MR. CAPPARELLA: I see. So what they're really saying is that the 1,000 feet should be measured from the edge of the habitat to the tip of the blade, which I know varies based on blade lengths. It just sounds like the number isn't clear in the document. Am I correct?

In other words, they're concerned -- 1,000 feet is the zone which is a safe zone. The killing part is the tip. So I guess I still don't understand how that's calculated in terms of blade length. I'm just confused on that.

MS. GIAMPOLI: That thousand foot is the definition of habitat. There's no actual description of its relation to turbines in that document. It's describing how to conduct summer surveys; so it's not -- it's not a document that discusses the setbacks themselves.

MR. CAPPARELLA: Right. So a setback isn't really related to the killing part of the turbines. That's what I'm getting at.

MR. PARZYCK: There's a thousand-foot setback criteria that we establish when we begin our layouts. On this project, no turbine tips enter into that thousand-foot setback.

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MR. CAPPARELLA: Oh, no turbine tips, okay. Thank you. Sorry for not being clear on my questions.

And then, finally, you mentioned, in rejecting IDNR recommendation number 3, that instead you would have to be doing things anyway under the Army Corps of Engineers nation-wide permit.

Am I correct that that nation-wide permit application does not allow for public comment?

MS. GIAMPOLI: I'm not entirely sure of the answer to that.

MR. CAPPARELLA: I know, in the past, the nation-wide permit -- I think number 6 is the one -- if I understand correctly, that doesn't allow for public comment.

I don't know if it allows for county or other comment. Because the Corps has those two categories, ones that allow it and ones that don't. And I didn't know if your rationale was because you thought the public could still comment on number 3 if there were any concerns for a particular activity.

MS. GIAMPOLI: The public has the ability to comment on the development of the nation-wide permits themselves but not the issuance of each individual permit.

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MR. CAPPARELLA: Exactly. That's what I wanted to get at. Okay. Thank you.

MR. ZIMMERMAN: I would like a point of clarification. It's been suggested that the killing part of the blade -- that birds or raptors or others just get hit by the end of the blade.

What evidence is there for -- because I assume that the birds fly through the circle and get hit, not just by the tip, but by the whole blade.

MR. PARZYCK: The point is that the bat forages a thousand feet from the riparian corridor.

Our turbines are set -- and if you look at the rotor -- our blades stick out or the rotor sticks out -- the radius is a little over 200 feet. None of the radius of the blades enters into that space. In other words, we are set back on the order of 1,200, 1,300, 1,500 feet from that corridor; so it's never going to interact with the species.

MR. ZIMMERMAN: So while the chart up here was 1,000 feet, your actual setbacks are at least 1,200 feet from whatever habitat you've identified?

MR. PARZYCK: Exactly. Based on other criteria.

MR. DENEEN: My name is Daniel Deneen, 2219

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West Oakland Avenue, Bloomington.

MR. DICK: Could you spell your name, please?

MR. DENEEN: D-e-n-e-e-n.

First, Mr. Parzyck, why did you wait until this afternoon to send your response to the IDNR recommendations to this Board and to the public?

MR. PARZYCK: Because we received the letter from the IDNR on Tuesday evening. We worked on the response; and as soon as we prepared the response, we sent it in.

MR. DENEEN: What is the applicable County rule dealing with IDNR standards?

MR. PARZYCK: If I'm not mistaken, the Zoning Ordinance requires that we are in consultation with the IDNR.

MR. DENEEN: Could it be that you have to provide credible evidence to overcome their recommendations?

MR. PARZYCK: I don't have it at my fingertips.

MR. DENEEN: Mr. Dick, could you please recite the rule into the record?

MR. DICK: This is under Article 6, dealing

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with wildlife and WECS, wind farms.
"Required implementation of IDNR recommendations based on presiting results unless credible evidence is presented against the recommendation."
MR. DENEEN: As to number 2, why should Invenergy be allowed to follow industry standards instead of IDNR recommendations?
MR. PARZYCK: The recommendations of the IDNR -- I mean, based on our history with these projects, we have found, as Andrea had explained earlier, that based on what we have found thus far, one year is sufficient to give us indication of any impacts.
MR. DENEEN: Why should your findings be given greater weight than the IDNR?
MR. PARZYCK: We're responding to the recommendations made and saying why we feel that, based on -- why we come up with a means by which to satisfy that requirements based on history. So we have a history of working to investigate these problems with operating farms.
MR. DENEEN: But my question is: Why should you be allowed to determine that and not IDNR?

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MR. PARZYCK: We've responded accordingly based on our history in this area.
MR. ZIMMERMAN: Excuse me. A point of order. Mr. Dick, are we as the Board required to follow either -- are we required to follow anybody's standards other than our own in this respect?
We have recommendations from IDNR. We can follow them. We have comments and recommendations from the Applicant. And we'll probably possibly get comment from the public. To what extent are we required to follow any of these other than what is stated in our guidelines?
MR. DICK: My opinion is that you are required to determine whether the Applicant is giving you credible evidence that they're complying with those recommendations.
MR. ZIMMERMAN: We've had a whole litany of stipulations that we've done. So we may actually set a higher standard should we want to. And that's totally within our prerogative, isn't it?
MR. DICK: Yes.
MR. ZIMMERMAN: Thank you.
MR. DENEEN: There's a lot of landowners and people in the ag industry here. Your number 5, are

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steep-sloped straight ditches a proper agricultural practice in McLean County or prime farmland?
MR. PARZYCK: I'm sorry, I don't understand the question.
MR. DENEEN: Would you please look at number 5 in your letter where you describe steep-sloped straight ditches?
MR. PARZYCK: Okay.
MR. DENEEN: What did you mean by that, or was it written by a lawyer or somebody else?
MR. PARZYCK: What I'm saying here is that many of the ditches, many of the various streams in the area have been modified to accommodate agriculture, and they're no longer in their natural condition.
MR. DENEEN: Are you describing though -- didn't you describe a lot of them as being steep-sloped?
MR. PARZYCK: The steep slope -- my point there is that it says to "steep ditches flowing in straight lines," in other words, that they've been modified to accommodate agriculture.
MR. DENEEN: Did you ever personally go out and look at anything beyond a waterway that might be

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that way? Have you looked at the natural streams, the ones that do have perennial water, or is that just something you put down to satisfy number 5?
MR. PARZYCK: That was -- it says here that "many." I didn't say that all of them are.
MR. DENEEN: Okay. Does the United States Department of Agriculture pay farmers to keep from having steep slopes on their creeks and even waterways?
MR. PARZYCK: I don't know.
MR. DENEEN: Okay. We'll give you one last chance. What credible evidence do you have to oppose standard 5?
MR. PARZYCK: The question is: What does it achieve?
MR. DENEEN: No. The question is to you. You are not to question the people on the stand. The question is to you as the representative.
MR. PARZYCK: Right.
MR. DENEEN: The County Board and the Zoning Board of Appeals is supposed to ascertain if there is credible evidence for your refusal to follow IDNR recommendation number 5. The question is not why am I asking the question. So please answer the question.

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MR. PARZYCK: The answer to the question is the basis that the letter -- it's not all laid out here. The letter --

MR. DENEEN: Where is the evidence then?

MR. PARZYCK: Can you let me finish, please?

MR. DENEEN: Uh-huh.

MR. PARZYCK: So the letter that we received from IDNR indicates that there's a desire to stay 500 feet back from all perennial streams based on the possibility that vibrations would impact the aquatic life in those streams.

Our comment is that there is no basis for that 500 feet based on existing information in the public purview that turbines have vibrations and impact aquatic life in streams.

MR. DENEEN: Okay. Did you review the procedural rules that they handed out to the general public?

MR. PARZYCK: I'm sorry. What's your point?

MR. DENEEN: Once again, you are not to ask me questions. My question is: Did you read them and review them?

MR. PARZYCK: What you have in your hands? I do not have what you have in your hands.

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MR. DENEEN: Does this state that you are not to make vague and unsupported testimony?

MR. PARZYCK: What's your point?

MR. DENEEN: What credible evidence do you have to support number 5 instead of spouting out that there is evidence out there somewhere?

MR. PARZYCK: No. My comment was that there is no evidence that indicates that there is a need to stay 500 feet from a stream because of any impacts that turbines would have on aquatic life.

MR. DENEEN: Let's get back to the question framed in the rules of the County Board.

What credible evidence --

CHAIRMAN FINNIGAN: I think he's answered to the best of his ability.

MR. PARZYCK: I think I've answered.

MR. DENEEN: I think you have your answer. Thank you.

MR. DICK: Would anyone else want to ask questions?

MS. WINTERLAND: I'll make it quick. Amy Winterland.

So in number 1, where you're going to slow the turbine speed during the migratory season, is that for all turbines or just certain turbines that have been specified?

MR. PARZYCK: It's for all turbines.

MS. WINTERLAND: Second question is: Are you guys responsible for the floodplain thing too? Is that all under your environmental manager role, the floodplain maps?

MR. PARZYCK: With respect to -- I'm sorry, with respect to what?

MS. WINTERLAND: So when I was looking at the floodplain maps that are in the application, it looks like there are two -- and I didn't look at all of them, just the ones in my area -- two of them that are, like, right on the edge of the floodplain. So I didn't know if there was a rule in the environmental studies that say you're supposed to stay off floodplains?

MR. PARZYCK: There's no requirement that we have to stay outside of the floodplain. We do it even if it's right on the edge because that is the limit of the 100-year floodplain. We do it to maintain the integrity of our facilities. We don't want them in a floodplain.

MS. WINTERLAND: So there's no requirement

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to stay out of a floodplain?

MR. PARZYCK: That's correct.

MS. WINTERLAND: This is just informational.

MR. PARZYCK: Yes.

MR. HILL: David Hill, H-i-l-l, 29725 East 2100 North Road. That's a Colfax address.

If I understood the testimony correctly, there's 117 sites. Only two of them are within half a mile of the river, the Mackinaw; is that correct?

MR. PARZYCK: That's correct.

MR. HILL: I guess I'm considering the recommendation to be at least a half a mile out.

What would cause you to feel that those two sites were absolutely essential for you to choose as sites to erect turbines?

MR. PARZYCK: Well, there is no requirement for a half mile that we would use in our evaluation of laying the project out.

MR. HILL: I understand that. What would cause you to consider that the recommendation shouldn't need to apply, that that's such a crucial site that you're going to pick it in spite of the recommendation?

MR. PARZYCK: The recommendation by the IDNR

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is made to the County. It's not made to us. We're responding to what is possible -- what we can do with respect to those recommendations.

MR. HILL: You're aware that this is a recommendation that's coming. My question to you is: Knowing this -- and it's only two sites -- what would make you think that those two sites were essential that you had to choose those over other sites? Because you're not picking all 117. You're only picking 100.

MR. PARZYCK: And I'm not saying that we are. Right?

MR. HILL: Thank you.

CHAIRMAN FINNIGAN: I think Mr. Dick has a clarification.

MR. DICK: I wanted to ask: Where did you notify us that all turbines would be a half mile from the Mackinaw River?

MS. GIAMPOLI: In our response to number 6, we said that if the County makes that recommendation, we would be willing to adopt that.

The second sentence of our response says that ". . . willing to site all turbines more than half mile from the Mackinaw River if the County makes

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this recommendation."

MR. DICK: Thank you.

CHAIRMAN FINNIGAN: is there any more questions? One more. Come on up.

MR. DICK: I'd like to make one other clarification. Under our ordinance, the WECS located in a special flood hazard area or wetland shall comply with the requirements of the floodplain overlay district. So it's very unlikely that you'd be able to put a turbine in a floodplain.

MR. YOUNG: Good evening. My name is Yale Young, just like the college, forklift, or lock. Yale, Y-a-l-e. I reside at 27297 East 2250 North Road in Lexington.

My wife and I purchased a short 40 acres approximately in 2012, and we have -- within that, we reside in about 55 acres of mine and the neighbors to the south of continuous timber ground.

CHAIRMAN FINNIGAN: This is just for questions.

MR. YOUNG: I'm getting there. So with that being said, I heard a couple of quotes up here. I want to have a definition of a high quality perennial stream.

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MS. GIAMPOLI: Is that a term we used in our response?

MR. YOUNG: You did. Mr. Kevin -- I'm going to butcher his last name -- said about nothing building in high quality streams and rivers. And you also said we recommend a thousand feet from the Mackinaw River and creeks because of the habitat. And you said that that was a high-quality perennial stream. So I would like a definition of a high-quality perennial stream.

MS. TURNER: I think this is when you were talking about boring under and not disturbing any of the streams. That's what he was talking about when he brought that up.

MR. YOUNG: I just want a definition of it.

MR. PARZYCK: I apologize if I was unclear there. We bore under all streams, not necessarily a high-quality stream.

MR. YOUNG: My point being, getting into this number 5 on these setbacks, you know, I heard that about the ditches and then number 5; but what's a definition? Because in your writing, you say they're straight and steep, correct?

MR. PARZYCK: Right.

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MR. YOUNG: I own a half mile of Patton Creek. You guys are welcome to come walk it. There's nothing straight about that. And right across the road, in the drainage ditches, it does get straight. So where do we define that at, from a habitat to a drainage ditch?

MR. PARZYCK: The term "high quality" was actually used in the letter from the IDNR in describing the Mackinaw River and the confluence with the creek. So that's where "high quality" came from.

We make the comment that many of the rivers or the creeks in the project area are straight, but it's just part of our discussion about the fact that we do not see a need for a 500-foot setback based on the IDNR's concerns with regard to vibrations from turbines impacting aquatic life.

MR. YOUNG: My concern is number 65. The turbine number 65 is roughly 100 to 200 feet from Patton Creek. There's also CRP ground on both sides of that, and that acts as habitat as well. So that's why I was just trying to qualify what that is.

MR. PARZYCK: I can't speak to where that turbine is located. We could investigate where it is.

MR. YOUNG: It's 800 feet from my property

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line. It's a thousand feet from my forest, and it's 1,500 feet from my house.

MR. PARZYCK: Okay. But I would have to look at what the creek impact is.

MR. YOUNG: So I guess one last thing is I would like to recommend number 5 setback for the perennial streams as the IDNR recommendations to you the County Board. Thank you.

MR. ZIMMERMAN: I think, for the record, isn't a perennial stream one that runs all year around? There's some technical definition somewhere, I think in the other notes, that gives the definition of a perennial stream versus an intermittent stream. I think there's another scale done on that.

MR. DICK: How about the high quality part?

MR. ZIMMERMAN: High quality wasn't part of recommendation number 5. "Department recommends this County consider imposing a requirement for the Applicant to avoid siting turbines within 500 feet of a perennial stream."

I don't see anything concerning vibrations there either. I think it might have been the habitat or something else. Vibrations were something that came in from testimony. And it might be from one of

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the others.

MR. DICK: You may need to clarify which of the perennial streams and how far they go up.

MR. ZIMMERMAN: I was just reading the cliff notes.

CHAIRMAN FINNIGAN: Anyone else have questions?

(No response.)

CHAIRMAN FINNIGAN: We are ready for your next witness if that's the case.

MR. GRIFFIN: Thank you, Mr. Chairman. The next witness is Mr. David Loomis, and he's going to testify concerning the economic impacts of the project. And, again, he has a PowerPoint to go along with his testimony. And he needs to be sworn in.

(David Loomis sworn.)

CHAIRMAN FINNIGAN: State your name and address for the record.

MR. LOOMIS: My name is David Loomis. My address is 2705 Kolby Court, Bloomington.

Good evening. I know it's been a long evening so far. It does look like we have copies of my PowerPoint presentation available.

My name is David Loomis. I have a PhD in

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economics from Temple University, and I'm Professor of Economics at Illinois State University. I've been at the university since 1996 and achieved full professor in 2010. I'm also Director of The Center for Renewable Energy and was cofounder of that center as well as organizing the Illinois Wind Working Group since 2006. I've been doing research on wind energy since 2003. I'm also cofounder of our renewable energy major. We have a Bachelor of Science in renewable energy at the university that I, along with two other of my colleagues, helped to create at the university. I have over 25 peer-reviewed publications, and I've given expert testimony before county boards, Senate committees, and regulatory bodies such as the Illinois Commerce Commission. My full CV is contained in an appendix to the report.

The purpose of my testimony here is to quantify the economic impacts of the project and also to highlight the local tax benefits that will come from the project.

To look at the economic impact studies, I used a model called the Jobs and Economic Developments Impact model. It's the JEDI model. Somebody liked Star Wars when they dreamed up the acronym. It was

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developed by National Renewable Energy Laboratories in Golden, Colorado, and they continuously update it. So the version of the model that I used was that listed there, but it goes by the date; so it was posted 12/23/2016. So this is a model that's continuously updated.

It's based on the IMPLAN model. The IMPLAN model is an industry standard model used to look at economic impacts. I used the IMPLAN multiplier specific to McLean County in using this model.

So the model really looks at wind energy and all the different components and costs that would go into developing a wind farm, and then the multipliers are specific to McLean County. They're generic that would be used by any economic impact study in McLean County.

So the method that we used when looking at an economic impact analysis is, if you look at the far left box, we look at the initial capital expenditures as well as the ongoing operations and maintenance expenditures that the Company is going to be using over the life of the project.

Of particular interest, we want to look at those middle boxes. We want to say: How much of that

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expenditure is going to go into local expenditures that are going to, for our purposes, stay here within McLean County.

We also wanted to look at what's the impact for the state of Illinois as a whole. And then, finally, we're looking at those expenditures that are what we call "leakage." It's expenditures that are going to go outside of either the local or the state; so it's going to go to another state and be purchased there. The reason that's important is we want to look at how much of that gets recirculated within the local economy, because a dollar injected into local economy and spent here will then get multiplied throughout.

The right-hand side is what we're looking at. We're looking at that initial investment plus this region -- in our case, I'll highlight McLean County, but the report also has the state of Illinois results.

And then, finally, the economic leakage is that that's going elsewhere. It might be other states. It might be international expenditures.

In particular, when we're looking at an economic impact study, we're looking at three main parts. The first is number 1, the on-site labor and

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professional services. That's those construction jobs that will be constructing the wind farm during that period. It's also the on-site technicians that will be doing the operations and maintenance over the long haul. That's pretty visible and easy to see.

Number 2, we want to look at the equipment production and supply chain effect; whereas, number 1 is really called "direct effects." Number 2 is typically called an "indirect effect," where we're looking at what are those things that are going to be purchased here in the local economy, and what are the jobs and earnings that those create within the local economy.

Then finally number 3, what's called the "induced economic impact." So as those households from both the direct and the indirect have more income to spend, they'll typically spend it on meals out, clothing, movie entertainment; and we capture that in that third category of induced impacts.

So whenever you do an economic impact study, it's always good to step back and say: What are the cautions as we look at an economic impact analysis.

It's important to know that the results are an estimate and highly dependent on the assumptions

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that are used. I'll highlight some of the ways that we tried to be conservative in that.

The results really are not a measure of the project viability. So we're assuming that it gets built and that Invenergy does well; but we're not looking at: Is this profitable? Is it a good use of opinion money. It's just saying, when it gets built, what is that going to do to the local economy?

We look at gross jobs rather than net jobs. So we're really looking at: What are the jobs that are created from this project? And I didn't take into account those things that might happen, say, in the electricity market. If you build a wind farm here, will that cause a coal plant to close elsewhere? I didn't take into account that effect.

But also, in my opinion, a wind farm of this size is not going to cause that to happen. I think it will have minimal impact on the electricity market as a whole. So I don't think that that's a terrible assumption just to look at our gross jobs.

We looked at the assumptions around local sourcing and procurement because that is important to saying how much of that is going to stay within the county and the state.

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I also reported all these results in terms of full-time equivalent jobs. Oftentimes you'll see jobs that are somewhat inflated because they count part-time jobs. And I've taken each of those part-time jobs and put it on a full-time equivalent basis, which would be 2,080 hours worked in a year. So what oftentimes can happen -- Oh, and so this is also annual in terms of full-time equivalence. So this is saying a job year in that way, especially in the construction aspect. So the construction might only last six months to nine months, but I've done it for a whole year. So these numbers are full-time equivalents.

As we look then at table 3 in the report and project it overhead, we're looking at, during the construction phase for McLean County, at 147 jobs in that direct or project development and on-site labor impacts.

The second category is really that indirect. The turbine and supply chain impacts for McLean County during construction would be 290 jobs. Induced impacts is 82 jobs, for a total of 519 jobs created or supported within McLean County.

If we look at the operations impact, the

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on-site labor impacts, those would be wind turbine technicians, administrative staff, supervisors associated with the wind farm. Those would be 10. Local revenue and supply chain impacts would be an additional 11. And those induced impacts would be another 14, for a total of 35.

So when we're looking at those supply chain impacts here both on construction and operations, you're really thinking during construction of those materials that are purchased locally, the concrete. We talked about -- Mr. Parzyck said that they're going to go down, you know, 10 feet. So it's concrete and rebar that's going to get sourced locally almost inevitably because, you know, you don't transport concrete long distances.

The rebar, gravel, all of those roads that have to be created for the maintenance workers to get to the turbine, those are all going to be typically sourced locally.

I think there's the intent to use local union labor for this project during construction. Certainly there's going to be -- GE has a crew that are going to have engineers and so forth that will probably be out of state or out of county, but they

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employ lots of local union labor during construction.

If we look at those supply chain impacts during operations, things that a normal business is going to use, like vehicles, the fees and permits, fuel, utilities, consumables, all of those would go into the supply chain impacts that would be during operations.

So if we look at earnings, we care about earnings because we like jobs, but we'd like good-paying jobs to come into the county. So these are the total earnings that will come from those jobs that we reported in the previous tables.

I'll just highlight one figure here because it's easy to do. If you look at those on-site labor impacts, you see the 445,783. And you saw on the previous slide that it was 10 jobs. So we can take that and say the average wage under those on-site labor impacts is going to be approximately $44,500 for the worker.

I will add that, if we did that same exercise and looked at those impacts, especially in those induced impacts, those will typically be lower-wage jobs. Those are retail, you know, restaurant jobs, and so forth. I don't want to

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mislead you in choosing the highest number there.

If we look at, then on table 5, a total output -- now total output is a measure like gross domestic product. It's looking at the value of goods and services as a whole. So this is going to include those earnings that we have in the previous table, but it's going to be more comprehensive in looking at the impact on the project.

It looks, in addition, at landowner payments. So landowner payments are not included in the previous section because it's not earnings. They didn't earn that. They received it as a payment, a rental payment, if you will, for that site selection. So if we look at this, this is going to include landowner payments. It's also going to include tax revenues that are paid within the county.

Let me turn now to tax revenues. I had to make certain assumptions when doing the tax analysis. I assumed the valuation of the wind farm is the same that's set forth in the Public Act that's referenced here.

In 2007, there was a law passed by State of Illinois -- after much angst, I might add -- to value wind farms on a state-wide basis. What had been done

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before was each county assessor would have to determine the value of the wind farm, and it varied quite widely from county to county. So that was not good for the developers who were trying to plan and know what their tax bill is going to be. It was not good for the County because the county assessor might only have one wind farm and look for guidance.

So there was an agreement put into law and codified here as to the exact valuation of a wind farm for tax purposes, and it was done on a megawatt basis of capacity so that there's no disagreement. Here's the law. Here's what it's going to be.

That law has a sunset clause in it. It was originally -- in 2007, it was set to expire in 2011, and then it was renewed until 2016. I believe it's been renewed now to the year 2020. If this were at any point in time set to expire, what would happen would be that then the wind farm would be the purview of the county assessor to then make a determination of what that value of that wind farm is.

So it's not that that would be exempt from taxes. It just means that there's no statewide assessment that's in effect, and the county assessor would then have to do it

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Having a wind farm that's already in service or having a statute like this, I would think that most county assessors are going to come in somewhat close to what the statewide statute has been previously. So I think, even in that case, the numbers and the estimates I've put forward here are valid.

In the law, they had the foresight not to just have it at a fixed rate, but they had a trending factor that's in there. It says that that trending factor is according to the consumer price index. So they take the consumer price index, and that's what they call a trending factor.

So I've included the consumer price index up until the very last consumer price index that we had available when I did the report. But then I had to say: Well, what's future inflation going to be? And even though I'm an economist, that's not my field of expertise.

But 2.2 inflation, you might argue that it might be higher or lower, but that seemed about reasonable. And it's been what inflation has been over the last -- I think I did three years, five years, and looked at that. That seemed reasonable.

Then in the law, it has a depreciation of 4

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percent. So each year the wind farm, for these tax purposes, can depreciate the wind farm by 4 percent. But in the statute, it says that it cannot depreciate it more than a maximum of 70 percent of its original value.

I also assumed a constant tax rate. If you could tell me what the county and all the different school tax rates were, I could put that in. But I used -- just saying that it's going to be constant at what it is currently. And I assumed that it's placed in service exactly on January 1, 2020, and has that fair cash value that's listed there, based on the statute.

I assumed that the wind farm was going to be in existence for 30 years and then would be decommissioned at the end of that 30 years and then would be paying no more taxes after it goes away.

So if we looked at the effect then for McLean County, the county tax, it would start out receiving annually 344,126 in tax year 2020. That would go down because of that 4 percent depreciation. The 4 percent depreciation is larger than the 2.2 inflation factor; so you get a slight decrease each year.

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That bottoms out in the year 2038, which unfortunately -- because I didn't want to put all of those numbers on the slide -- is not listed; but it's 2038, is the year that depreciation bottoms out and they're at their maximum depreciation. Then that trending factor takes over. Based on inflation, that will increase it.

So over the course of that total 30 years, the expected total taxes that the wind farm would pay to the County would be on the order of $6.9 million.

If we then turn to the townships -- now, we've talked about the fact that there's only 100 turbines that are actually going to be placed in service, but there's a number of different locations that are possible for those to go in. And maybe based on that, there's two less here. I don't know.

But if we look at that, we had to make some assumptions. So what we did was we, for the purposes of how many turbines are going to be in each township, we did it proportionally, knowing that you can't have part of a turbine in a township. So we rounded to the nearest one. So these are not exact. They are based on 100 turbines, not the total location, but we've prorated them according to the difference townships

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and rounded to the nearest turbine.

So you could see the values range from Money Creek Township at the low end of $2,338 in the first year all the way up to Lawndale Township with 42,378. And of course those are going to decline along with depreciation, and it will still be that same year of 2038 in which it will bottom out and then come up. Then you can see the totals down at the bottom.

The other taxing body that I looked at was the school district. So this is not, obviously, all of the taxing districts. Again, it would get more sticky the exact locations, prorating those, if we went down to the fire districts and park districts and other things like that.

But we could look at the school districts. And again, we prorated these according to the 100-turbine estimate. You can see that Lexington School District is the highest with almost $1.3 million in annual tax revenue coming in from this project. The low end would be El Paso/Gridley School District with 192,640 coming in in year 2020. And those decrease.

Now, two things happen with school districts that are important to keep in mind. The state aid

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that school districts get from Springfield are based upon the equalized assessed value within that school district's footprint. So a richer school district is deemed to have more resources locally and therefore gets less money from Springfield than a poorer school district.

A coauthor and I looked at this problem and looked at what is the net effect of having a wind farm in a school district. That report is available on the Center for Renewable Energy's website. Found overwhelmingly that the net effect is largely positive. There is a reduction from your state aid from Springfield, but it's small in comparison to the money that you're getting directly from the wind farm.

I might add, one of the unintended effects as we were doing that report was that the school district actually receives a bonus at the beginning of the start of the project. Because when a school district -- when the wind farm comes into being, they are based then on that tax year, and they'll collect that at the end of that year. But when Springfield looks at how much aid they give to a school district, they're two years behind. So they will not have caught up with the fact that you're a richer school

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district and, therefore, you needless aid. So you're getting the full tax benefit from the wind farm, and Springfield hasn't reduced your state aid yet. Okay? So you get both in hand the first year.

That comes back to bite you 30 years from now. So when the wind farm goes away, in year 2050 according to my assumptions, you've got no tax revenue coming from the wind farm because it doesn't exist. But Springfield still thinks you have a wind farm and will not give you state aid because it's two years in arrears.

So it's just a caution that I like to make. Maybe I should be making that to the Lexington School District, that they need to have a rainy-day fund. I'm doubtful that that's going to last 30 years, but the point should be made.

And it is notable that the wind farm is not the only taxing entity that they're going to get money from; so that will get rolled up into all of their revenues.

I will say that we've changed this -- August 31, Governor Rauner signed into law a new formula for funding of school districts. It fundamentally changes how we do that. But the first thing that it does do

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is it starts with what you got last time. Then it says that any new moneys that they're going to put through for K through 12 education will be allocated according to a new formula. So looking at the relative numbers, that's not going to really affect the decrease in state aid substantially from what we had in the previous report.

In conclusion, we're looking at 519 new local jobs in McLean County during construction caused by this project, another 35 long-term jobs in McLean County during the life of the project, projected to be 30 years, $56.9 million in economic output during construction, 7.9 million in output annually during the life of the project. And I won't try and summarize all the tax numbers for you that we just went through.

With that, I look forward to answering any questions you may have.

MR. GRIFFIN: A few follow-up questions, Dr. Loomis. If you could go back one slide? I know you testified about this, but I want to make it clear to everyone in the audience.

For year 2050 here, you've got a zero because you assumed, in order to come up with a grand

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total, that the wind farm was no longer in existence as of that year, correct?

DR. LOOMIS: That's correct.

MR. GRIFFIN: So let's assume that the wind farm is still going strong in the year 2050 and it's not been decommissioned. Would the taxable value in those tax dollars be zero or something else?

DR. LOOMIS: They would be essentially what they are in 2049 with that inflation trending factor in there. So it would be 2.2 percent higher.

MR. GRIFFIN: So as long as that wind farm is still operating and in existence, it's going to be contributing to the tax revenues for the County and the taxing districts, correct?

DR. LOOMIS: That's correct.

MR. GRIFFIN: I would then ask that Mr. Loomis's PowerPoint be entered as Applicant's Exhibit 11, Mr. Chairman.

CHAIRMAN FINNIGAN: That will be done. Questions from the Board?

MR. ZIMMERMAN: We've noticed that the power of the nacelles, of the generators, has gone up significantly. One of the last ones we heard was 1.5, roughly, megawatts per nacelle, per tower. Now we're

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looking at 2.5.
Should these turbines be replaced in, say, 15 or 20 years or even at 30 years with something that upgrades it, then this also would continue on; and there might be a revaluation according to the added inputs?
DR. LOOMIS: That would be correct. It's based on the megawatts of capacity for the wind farm. So in -- I believe it's the Paw Paw wind farm that is looking at repowering now.
MR. ZIMMERMAN: Where is that?
DR. LOOMIS: Paw Paw. And they have installed, you know, older turbines. Even actually when they were installed, they were not the latest technology. So they're looking at repowering, and they would be subject to this higher assessed value based on the higher megawatt of capacity for that wind farm. So this would follow the same here.
MR. DICK: When they put new turbines in, do they set the new rating in and start at year zero?
DR. LOOMIS: Yes, I believe so. But I don't think we've had a case yet. The Paw Paw case will be the first one to do that. But I think the way I would interpret that would be that it would start at the

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valuation at the beginning of that -- when that new wind farm, if you will, goes into service.
MR. GRIFFIN: Phil, that would be my understanding also. It would be new equipment; therefore, it would be taxed as a new turbine, and the depreciation would then start again.
MR. DICK: Thank you.
MR. BANGERT: How is that reported? If they take one down and put one up, how is that reported or what record exists of that?
DR. LOOMIS: I think they have to go through a permitting hearing similar to this in order to do the repowering because it's going to be, you know, new turbines. They've got to get new building permits. So that will all be recorded.
MS. TURNER: In your studies, have you noticed any negative impact to valuations of the properties surrounding the turbines? Have you had to take that into consideration at all as you go through this, decreases in tax income?
DR. LOOMIS: I've had two graduate students in the Economics Department who have done studies looking at this question of property values.
The first of my students looked at the Twin

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Groves Wind Farm and looked at properties in and around Twin Groves. We did a three-mile radius around each of the turbines to look at any of the homes, residential homes, that would be affected.
What we found was -- which was interesting from Tuesday night -- there is this clear effect that -- we looked at a three-stage model. And we said, when a wind farm is first announced, so public announcement like this, you will see a short-term decrease in properties that are sold.
Then during the time after the wind farm gets built, we actually saw an increase in property values, not only based on the decrease that had happened in the intervening years, but to the original value to those homes.
So we conjectured -- or my student conjectured -- that it could be due to the fact that you have the school district intact. If you have a school district that gets $1.2, $1.3 million more, the property values around there go up.
You know, if you have a new residential subdivision that comes in off of farmland, you got a whole bunch more kids to educate. So, yeah, it's nice to have more tax revenue, but you have more kids

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coming in.
Wind farms have no children to educate. It's kind of, you know, dollar signs to a school superintendent to see those kinds of dollars. I've sat through a lot of hearings where school superintendents testified and put it in real terms, like: I can hire four more teachers. We can get back our football program -- those kinds of things with the wind farm coming into the community.
So yes, I think that that's a very real possibility.
A second student did a study looking in Lee County, and there weren't as many properties that were sold during that time period. But, again, we found no statistically significant decrease in property values.
So I don't think there's any decline that would be caused by the wind farm that would decrease the overall tax base.
MS. TURNER: Thank you. I suspected as much, that with the increase in school district funds, that that may help improve property values.
Just out of curiosity, in the time that it did go down, was that during construction? Before construction? Do you know?

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DR. LOOMIS: It's been a while since we did the study, but it is available out in the Center for Renewable Energy's website.

We did kind of a -- two different models. We looked at -- before the wind farm was operational was period one and then afterwards, so before and after. There you see that positive impact.

We did a three-period model, where we said before the public announcement. So some people know about it, but the general public doesn't know about it. Then period two is between that announcement and operations. And then period three is there. And that's where you saw that period two seeing property value declines. People who sold during that time had a decline in value. If they held off until it was operational, you saw an increase.

MS. TURNER: So it's during that indiscernible time as to: Where are these things going to be, and is it going to happen?

DR. LOOMIS: Yeah. It's the question of what is this going to do? What is it going to look like? -- a period of uncertainty.

MS. TURNER: Thank you.

CHAIRMAN FINNIGAN: Any other questions?

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(No response.)

CHAIRMAN FINNIGAN: Does anyone in the audience have questions of this witness? Come forward.

MR. SCHWASS: Glen Schwass. 27709 North 2550 East Road, Lexington, Illinois.

I know everybody wants to get out of here. I really do appreciate your study. I think it was probably, along with one other, one of the most thorough things we've seen and probably the most credible.

So my concern is this: Were you here Tuesday night?

DR. LOOMIS: Yeah.

MR. SCHWASS: I think the question was asked Tuesday night that we were concerned about the property value and that there was no negative impact on the property value, but yet stage 1 is where we're at in the process.

Are you saying we should expect decrease in property value since we're in stage 1 of listing a property?

DR. LOOMIS: We're actually in stage 2. It's already become public. As soon as it's published

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in the paper, we would be now in that kind of middle time period.

It is a statistical model; so you're looking at statistical average home prices. It doesn't mean that that's going to affect every single property. But based on that Twin Groves period -- and I would also caution that that was the very first wind farm in the county.

So I think, if you look historically at that, you'd say people didn't have much experience. And it was one of the first in Illinois at all. Whereas, now, even as you heard tonight, people said, with noise: "Have you been by the other two wind farms? It's not that far of a drive."

I think people know what it's going to look like a lot more. We drive past them every day. So it's not as much of a surprise. But Twin Groves, I think that was -- it created more uncertainty than I think this one will.

MR. SCHWASS: So stage 2, am I to expect no decrease or no increase?

DR. LOOMIS: I don't think my model can speak anything to your particular experience.

MR. SCHWASS: Again, you caught my attention

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because it was quite different from what we heard Tuesday night, that there was no negative impact. Yet we're seeing a negative impact in stage 1. Now stage 2 we're concerned with where it's at.

MR. GRIFFIN: I want to clarify. Mr. MaRous was comparing properties that sold that were located near wind energy projects versus those not located near.

By the nature of the study, he had to -- he was only determining -- comparing ones where the turbines were already built versus properties where there were no turbines. It's a different study than what Dr. Loomis referred to. He wasn't trying to study what happened during construction or during the permitting phase, but just the impact of the actual turbines being in existence versus turbines not being in existence.

MR. SCHWASS: What's the duration of this project when it starts being built? You talked about all of these jobs. And I don't want to be sounding negative because I'm very proactive for employment as well.

You talk about 519 new jobs. Over what duration?

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DR. LOOMIS: That's a full-time equivalent of a job year. For example, if you -- the wind farm could be built in as little as six months. I don't know what Invenergy's plans are, but I've seen them as soon as that.

If you took six months to build it, you would actually see that effect of being 1,038 actual workers on site for that nine months, and that would be full-time people. If you had part-time people in there, it would be more than that. And that's not just on site, but it's looking at those supply chain and induced impacts; so you're not going to noses quite in that way.

MR. SCHWASS: Again, your numbers were -- it was very quick, and it was difficult to add them up. But in just a quick calculation, less than 20 percent of the money that you're talking about stays here in McLean County because we've got about 54 million as opposed to 250 million going outside of McLean County.

So of all of those jobs that we're talking about, how many of them are from Chicago? How many really are going to be here? How many people can we count on for the IBEW and the laborer's union? What's that number going to be in percentage?

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DR. LOOMIS: I'd have to say that it's going to be a lot. If you look out into the audience, I think there's an expectation that there's going to be lots of jobs for union labor here out of this project; so I think there's going to be lots of those jobs.

I will say -- and I failed to mention this earlier -- when I did the report and we looked at those supply chain impacts, we were very, very conservative; so these are not inflated numbers.

If you look at, like, the turbine impacts, we have -- the towers can be made in Clinton, Illinois. Trinity Structural Towers is located there. I think it's very likely that they will be sourced from Trinity Towers. We assumed zero impact of towers coming from that because we weren't sure.

In the nacelles are gear boxes. Many of those GE gear boxes are built in Elgin, Illinois, by Winergy, who is a GE supplier. So if you buy GE turbines, it's going to create manufacturing jobs for those gear boxes.

We assumed zero content coming from either McLean County or Illinois for all of those turbines. So you think about the cost of the turbine itself. We assumed none of that was sourced in Illinois.

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What we did assume was sourced in Illinois is some of, like, the non-GE, non-engineering labor, some of that supply chain, like the concrete, rebar, gravel, all of those things that you say. It's just good business sense to source that local. Who wants to transport that too far? It's going to be expensive.

So those are the kinds of things. So I think these numbers are really, really conservative.

MR. SCHWASS: You took one of my questions. That was one of them. The structural tower plant in Clinton, Illinois, I'm sure there's a lot of people that are full time that live in McLean County.

You said it could be sourced there. I guess I would like to be able to say that it should be sourced there, because that is impacting not only McLean County. It's impacting DeWitt. Again, I'm sure there are people from McLean County that work there; so why wouldn't we make the commitment to source that from Clinton, Illinois?

DR. LOOMIS: I think that's an Invenergy business decision. But in my experience, they have done a lot of projects here. They like to post, the next project, about how they did that.

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I would think that, if it makes good business sense -- I don't think they want to tie their hands in a public meeting saying we're going to source from this one. Then Trinity Towers could charge them whatever they wanted because they have it on the record that they're going to source from them. So until they have a contract --

MR. SCHWASS: My guess is they already have those prices set because they've given numbers for that.

Then the full-time employment for the duration of six months, how does that impact the economy then when, after the six months, these employees get laid off? Is there an impact from an unemployment standpoint and stuff like that on McLean County?

DR. LOOMIS: When we look at construction jobs, it is true that these are temporary construction jobs and, when this wind farm goes away, that there's got to be another construction project for those construction workers to go to.

I tried to make it clear these are the one-time impacts during construction. So that's temporary. But they are full-time equivalent for a

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year; so those are real jobs.
And construction workers have to deal with the fact that they've got to move from project to project. It's just the nature of construction.
But then, on the operations and maintenance, those are permanent, long-term, annual, recurring jobs.
MR. SCHWASS: You said 35 permanent jobs over the duration of 30 years. That, to me, comes out to one full-time job per year.
DR. LOOMIS: No, no, no. That's 35 people employed during the duration of the wind farm. So it's 35 people employed for the next 30 years. Might not be the same people. We hope not. Those ten turbine technicians are going to want promotions. I'm sure.
MR. SCHWASS: I don't know if I got the answer. I was probably looking at my next question. But I'll go back to it.
Again, I estimated $54 million stays in McLean County for labor and -- direct and indirect services and injected services, you said; but yet over 250 million comes from outside of McLean County.
Why couldn't there be more of a commitment

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to getting some of that money coming into McLean County? How many travel jobs come in in that percentage?
DR. LOOMIS: I don't know how many travel jobs come in, but there are things that just can't be sourced in McLean County. We don't have a turbine manufacturer here. You can't buy blades in McLean County. You can't buy blades anywhere in Illinois. So it's impossible to source some of those things in McLean County.
I'll say this. McLean County actually fairs very well compared to some other, more rural counties. We have a well-developed economy here. So if you look at the multipliers for McLean County by section, there's a lot of this that stays and reverberates within the county compared to some other counties. But there's just some things we don't have that you can't source from McLean County.
MR. SCHWASS: I appreciate your answer. I understand that you can't give me a definitive number.
But I think it would be in the best interests, if the Board is going to look at something like this, that you really look at the source of the employment and more of the jobs come from McLean

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County and not from Chicago or someplace else. McLean County is the one dealing with it. McLean County has to live with it. McLean County should benefit from it, not just from a school district standpoint.
DR. LOOMIS: And I think you do see that -- I tried to make it clear. Here's the McLean County numbers. You look at the state numbers -- I didn't highlight those, but those are much bigger.
MR. SCHWASS: 80 percent. 80 percent goes to the state. The only number I calculated -- and I was just too quick -- less than 20 percent was local.
DR. LOOMIS: Yeah. But I will say, in defense, Invenergy at least is headquartered in Chicago; so we keep some of that going into coffers in Springfield. As a university employee, I like to see money going to Springfield.
MR. SCHWASS: I'm sure a lot stays in Chicago too. Thank you very much appreciate your time.
CHAIRMAN FINNIGAN: We're past our time to quit. I guess we can poll to see how many questions we have. You just have one question?
MS. WINTERLAND: I just have one question. I promise. Amy Winterland.

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You mentioned the net effect on the school districts, and you said it was published someplace. Where was that?
DR. LOOMIS: We did a study at the Center for Renewable Energy. So if you go to renewableenergy.ilstu.edu, go on the left-hand side to "publications." I think it's called "Wind Farms and School Districts."
MS. WINTERLAND: Is there any way we could make that part of this document, what the net effect of the school district tax impact is? It's already done. Can we just make it part of this? Because I know people are already quoting what Lexington School District is going to make; and that's not on a net basis. I think it would really help people to understand what the net effect is. Is there any way we can make that part of our documents?
DR. LOOMIS: I will clarify that that report was done previous to the new school funding formula.
MS. WINTERLAND: Even so, I think it would be informative. Is that something you guys could --
DR. LOOMIS: We could make the report available.
MR. ZIMMERMAN: I think officially that

reference now is in evidence.

MS. WINTERLAND: Because people are looking at that, the big number, and I think they'd like to also look at the equalized value involved. Just consider. Thank you.

CHAIRMAN FINNIGAN: We're going to call a recess tonight, and we're going to readjourn -- continue, I guess is what we call it. No more questions tonight. We're going to hold them off. We got to stop somewhere. You can come back on January 9 at the Government Center at 7:00. And that's where we're going to reconvene.

(Proceedings concluded 10:10 p.m.)

STATE OF ILLINOIS)
) SS
COUNTY OF DeWITT)

I, BRENDA ZEITLER, CRR, RPR, and CSR, License No. 084-004062, in and for the state of Illinois, do hereby certify that the foregoing meeting was taken on the 4th day of January, 2018, before the McLean County Zoning Board of Appeals and that said meeting was taken down in stenograph notes, afterwards reduced to typewriting by me, and that this transcript is a true and accurate transcription of the testimony.

I do hereby certify that I am a disinterested person in this cause of action, that I am not a relative of any party or any attorney of record in this cause or an attorney for any party herein or otherwise interested in the event of this action, and that I am not in the employ of the attorneys for either party.

IN WITNESS WHEREOF, I have hereunto set my hand this 26th day of January, 2018.

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Brenda Zeitler, RPR, CRR, CSR

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